

DRAFT 2020 URBAN WATER MANAGEMENT PLAN

CITY OF ROSEVILLE CALIFORNIA

City of Roseville
Draft 2020 Urban Water Management Plan

May 2021

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Abbreviations

Acre(s)	ac
Acre Feet	AF
Acre Feet Per Year	AF/yr
American Community Survey	ACS
American River Basin	Basin
American River Basin Study	ARBS or Study
Aquifer Storage Recovery	ASR
Average Dry Weather Flow	ADWF
Barton Road Water Treatment Plant	BRWTP
California Department of Finance	CDoF
California State Groundwater Elevation Monitoring Program	CASGEM
California Water Code	CWC
California-American Water Company	Cal-Am
Central Valley Project Municipal and Industrial Water Shortage Policy	CVP M&I WSP
Citrus Heights Water District	CHWD
City of Roseville	COR or Roseville
City of Roseville Water Utility	City
Compressed Natural Gas	CNG
Cubic Feet Per Second	cfs
Degrees Fahrenheit	°F
Department of Water Resources	DWR
Drought Risk Assessment	DRA
Dwelling Unit	DU
Environmental Impact Statement	EIS
Environmental Utilities	EU
Equivalent Dwelling Unit	EDU
Gallons Per Day per Dwelling Unit	Gpd/DU
Gallons Per Minute	gpm
Groundwater Management Plan	GWMP
Groundwater Sustainability Agency	GSA
Groundwater Sustainability Plan	GSP
Hot Scenarios	HD, HW
Maximum Contaminant Level	MCL
Middle Fork Project	MFP
Million Gallon(s)	MG
Million Gallons Per Day	MGD
Model Water Efficient Landscape Ordinance	MWELO
Municipal and Industrial	M&I
National Pollutant Discharge Elimination System	NPDES
Operations Criteria and Plan	OCAP

Parts Per Million	ppm
Potential Evapotranspiration	PET
Placer County Water Agency	PCWA
Pounds Per Square Inch	psi
Regional Drought Contingency Plan/ Regional Water Reliability Plan	RWRP
Sacramento Suburban Water District	SSWD
San Juan Water District	SJWD
Senate Bill X7-7	SB X7-7
South Placer Municipal Utilities District	SPMUD
South Placer Wastewater Authority	SPWA
State of California Legislature	Legislature
State Water Project	SWP
Sustainable Groundwater Management Act	SGMA
Thousand Acre-Feet	TAF
United States Bureau of Reclamation	USBR
United States Bureau of Reclamation	USBR
Urban Water Management Plan	UWMP
Urban Water Management Plan Guidebook 2020	Guidebook
Urban Water Retail Supplier	Supplier
Warm Scenarios	WD, WW
Wastewater Treatment Plant	WWTP
Water Demand Tracking Tool	Tool
Water Forum Agreement	WFA
Water Shortage Contingency Plan	WSCP
Water Storage Investment Program	WSIP
Water Treatment Plant	WTP
Western Placer Groundwater Sustainability Agency	WPGSA

Executive Summary

ES. 1 Introduction

An Urban Water Management Plan (UWMP) is the legal and technical water management foundation for suppliers throughout California. A UWMP combines information from various sources that inform water supply and demand such as projects pertaining to local land use planning, regional water supply, infrastructure, and demand management. The City of Roseville Water Utility (City) participates in UWMP updates every five years, as required by law. Each UWMP update addresses all requirements pertaining to urban retail water suppliers in accordance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, also referred to as Senate Bill X7-7 (SB X7-7). Information contained in this 2020 UWMP includes the component listed in the following section.

ES. 2 Plan Components

The plan consists of the following components:

- **Chapter 1:** The basis for preparing a plan and the new requirements.
- **Chapter 2:** Summary of how the plan is prepared and coordination with the public and other local and regional authorities.
- **Chapter 3:** A description of the City's treatment facilities and distribution infrastructure, as well as a description of the population and area served by the City.
- **Chapter 4:** Quantification of water use for the 5-years preceding the plan update and water use projections for a 20-year planning horizon.
- **Chapter 5:** Supporting data for compliance with SB X7-7.
- **Chapter 6:** Description of existing and planned water supplies and water supply management.
- **Chapter 7:** A drought risk assessment (DRA), which analyzes water supplies and demands in a single year or multiple years of a water shortage.
- **Chapter 8**: The Water Shortage Contingency Plan (WSCP), which outlines the process that the City will execute in the event of a water shortage.
- **Chapter 9:** Demand measures that the City integrates and plans to integrate into its regular operations to address increasing demands.
- **Chapter 10:** Record of the process by which the UWMP was adopted, submitted, and implemented with the intention of making the plan widely available to the City's customers and the public.

ES. 3 Basis for Plan Preparation and Coordination

Urban water retail suppliers (suppliers) who either deliver 3,000-acre feet (AF) or more of water or have over 3,000 service connections are required to submit a UWMP. In 2020 the City had 46,112 service connections and supplied a total of 31,896 AF to its customers and therefore is required to prepare and submit an UWMP.

In preparation of the UWMP the City coordinated with the U.S. Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD), all of which supply water to the city on a wholesale basis. The City also actively sought involvement from the public and other local water agencies. Neighboring water retail suppliers and the community were informed of a public hearing to be held June 16, 2021. In this public

hearing the plan will be presented, and attendees are encouraged to share questions and concerns prior to the presentation of the UWMP in the City Council meeting which will be held on June 16, 2021, during which the plan will be adopted.

ES. 4 System and Supply Description

Raw water from Folsom Lake, the City's primary water source, is conveyed to the City's water treatment plant located in the Granite Bay area and is then distributed through the City's 600 miles of water mains to customers. Other water facilities that the City maintains include potable water storage tanks, pump stations, interties to exchange water with other water agencies, and groundwater wells.

The City receives its contract supplies purchased from USBR, PCWA, and SJWD through Folsom Reservoir. The City currently has 8 wells, 6 of which are in service, and is planning to expand their groundwater program as a means to having a more robust water supply available in the event of a water shortage condition. The City is also considering contract amendments with water agencies that would increase overall water supply resilience.

ES. 5 Past and Projected Water Use

The City supplies water to customers for the following water use sectors:

- Commercial
- Industrial
- Institutional and Governmental
- Multi-Family Residential
- Single Family Residential
- Landscape

The UWMP characterizes water use by sector for the years preceding the plan update as well as projections of water use for the next 25 years. Projections in the 2020 UWMP differ significantly from 2015 projections as a result of the rapid development pace observed in Roseville since the last plan update. When the 2015 UWMP was prepared the City of Roseville's General Plan anticipated that buildout of planned development would be reached in 2065. The City of Roseville updated the General Plan in August 2020 and current estimations, reflecting the pace of development, now indicate buildout of planned development will be complete by 2035. The City has taken a long-term approach to its overall water strategy planning and has planned for a population of up to 198,000 for 2035. The actual volume of water used by each sector for 2020 and updated water use projections through the year 2045 are summarized in ES Table 1.

ES Table 1 Actual 2020 Water Use and Projected Water Use through the Year 2045.

Water Use Sector	2020	2025	2030	2035	2040	2045
Commercial	2,630	6,135	6,508	7,017	7,017	7,017
Industrial	254	4,175	4,726	5,123	5,123	5,123
Institutional/ Governmental	412	8,904	9,494	10,321	10,321	10,321
Multi-Family	1,416	1,752	2,029	2,725	2,725	2,725
Single Family	17,115	22,564	24,508	26,281	26,281	26,281
Landscape	6,422	644	765	805	805	805
Losses	1,600	1,429	1,401	1,587	1,587	1,587
Groundwater recharge	597	1,560	2,720	3,350	3,350	3,350
Total	**30,445**	**47,163**	**52,151**	**57,210**	**57,210**	**57,210**
NOTES: All values are in AF/yr. Values represent potable water use only.						

ES. 6 SB X7-7

SB X7-7 called for a 20% reduction of water use from all retail water suppliers by the year 2020. In the 2015 UWMP the City calculated a 10-year and 5-year baseline period to determine an average baseline gallon per capita per day (GPCD) water use. This baseline demand was calculated to be 309 GPCD in accordance with the SB X7-7 standard methods. The 2020 target compliance water demand was 247 GPCD, a 20% reduction of the baseline. In 2020 the average demand for the City was 203 GPCD, which represents an approximately 34% reduction of the baseline demand. As such, the City is compliant with SB X7-7.

ES. 7 Supply Reliability and Drought Risk Assessment and Water Shortage Contingency Plan

A supply reliability and drought risk assessment were performed. The assessments considered the supply available for a single-year and five-year consecutive drought period for both the near-term and long-term. The supply availability was compared to the total water use to determine if a deficit is projected for any of the conditions. The supply availability is subject to seasonal and climatic shortages and so in a dry or critically dry years increasing limitations are placed on the City for volume of water that they receive from Folsom Lake. The supply and drought risk assessment demonstrated that there may be minor deficits in supply versus demand conditions under certain drought related circumstances. These minor shortages may occur in the near-term extended drought scenario as well as over the longer term for both extended and single year drought conditions. The highest level of deficiency identified represents less than 8% of the annual demand and can be remedied by the simple application of basic conservation measures, estimated to achieve 13% savings. The results of the drought risk assessment are summarized in ES Table 2.

ES Table 2 Near-Term and Long-Term Drought Risk Assessment Summary

Drought Type Assessed	Deficit Range	Description of Anticipated Deficit
Near-Term 5 Consecutive Dry Years	1,647	Deficit Expected in fifth year only
Long-Term Single Dry Year	1,647 – 1,824	Deficit expected in 2025-2045
Long-Term 5 Consecutive Dry Years	7 – 4,904	Deficit expected in fourth year for 2025-2045
	1,647 – 1,824	Deficit expected in fifth year of drought for 2025-2045
NOTES: All values are in AF/yr.		

To mitigate the projected deficits in a water shortage, a Water Shortage Contingency Plan (WSCP) was prepared. The WSCP outlines the procedures that the City will take annually to determine whether there will be a water deficit based on projected water demand and supply availability. If a deficit is anticipated the City will formally declare a water shortage emergency condition of varying levels dependent on the severity of the deficit. The declaration of the water shortage emergency condition will trigger a set of demand reduction actions that is to be carried out by the City and all water users. These demand reduction actions are set forth in the Roseville Municipal Code Chapter 14.09 Water Conservation and Drought Mitigation Ordinance. The legal authority of the City to enforce compliance with the demand reduction actions is granted by the Water Conservation and Drought Mitigation Ordinance.

ES. 8 Demand Management Measures

Aside from the demand reduction actions of the Water Conservation and Drought Mitigation Ordinance, the City has taken a proactive approach to managing demand under normal conditions as well. Demand management measures include accurate metering through a meter retrofit program which was implemented from 2001 to 2011, public education and outreach, and regional rebate programs for efficient water use fixtures. System losses, typically losses due to leaks in the pipe network, can account for a significant portion of water demand. The City continues to be proactive in its approach to address leaks in the system and reduce the overall losses, including an active acoustic leak detection program to identify and repair leaks throughout the distribution system, working to reduce overall system losses.

ES. 10 Plan Adoption and Submittal

The 2020 UWMP will be presented to City Council on June 16, 2021 for adoption. The 2020 UWMP will subsequently be submitted to the California Department of Water Resources for compliance with the Urban Water Management Planning Act. Copies of the plan have been made publicly available at the City's offices and an electronic version is also available for review and download on the City's website: www.roseville.ca.us/UWMP.

Chapter 1 Urban Water Management Plan Purpose and Description

This chapter introduces the Urban Water Management (UWMP) including legislation requiring urban water retail suppliers to submit UWMPs, necessary information required to be reported in the 2020 UWMP, an overview of the changes to legislation since the 2015 City of Roseville UWMP, and a description of benefits to the supplier and its customers in completing a UWMP.

1.1 California Legislation

The Urban Water Management Planning Act was enacted in 1983 by the State of California Legislature (Legislature). The law established the requirement that an urban water supplier (supplier), providing municipal water to over 3,000 customers or 3,000 acre-feet (AF) annually, adopt an UWMP every five years. The aim of the Urban Water Management Planning Act was to address declarations and findings of the California Water Code (CWC):

California Water Code Section 10610.2

(a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

Additionally, efforts aimed at protecting California's water supply were expanded in 2009 with Senate Bill X7-7 (SB X7-7), where Governor Schwarzenegger called for a 20% reduction statewide in per capita water use by 2020.

1.2 Updates to 2020 UWMP

Since the reporting of the 2015 UWMP, there have been various requirements added by the Legislature to the CWC. Subsequent chapters of this report will provide necessary information to address requirements applicable to the City. The major new requirements are described in the following sections.

1.2.1 Lay Description

Pursuant to Section 10630.5, all plans are now required to include a lay description. This description shall include how much water the City has on a reliable basis, anticipated demands for the foreseeable future, the City's plan to meet those future demands, any challenges that the City will face in the future, and other information that will provide the public with an understanding of the City's 2020 UWMP.

The requirement for this lay description is met in the executive summary.

1.2.2 Water Loss Reporting

Pursuant to Section 10631(d)(3)(C), the 2020 UWMP shall include past water loss for the 5-years preceding the plan. The 2015 UWMP included water loss data from 2015 only.

1.2.3 Energy Use Information

Pursuant to 10631.2, the 2020 UWMP shall include any information related to the amount of energy consumed in various water processed to estimate the energy intensity.

1.2.4 Groundwater Supplies Coordination

Pursuant to 10631(b)(4)(A), if groundwater is identified as a source of water available to the supplier the 2020 UWMP shall coordinate with the current version of any groundwater sustainability plan adopted pursuant to 10720, Sustainable Groundwater Management Act, or any other authority for groundwater management for basins underlying the service area.

1.2.5 Five Consecutive Dry-Year Water Reliability Assessment

Pursuant to 10631(f), suppliers must now include a description of actions they will implement for a period of drought lasting five consecutive water years as opposed to the 2015 UWMP requirement, which was for multiple dry water years.

1.2.6 Drought Risk Assessment

Pursuant to 10635(b), all suppliers are required to include a drought risk assessment (DRA) in the UWMP. Interim updates to the DRA may be conducted by the supplier within the five-year cycle of the UWMP update.

1.2.7 Water Shortage Contingency Plan

Pursuant to Section 10632, every urban water supplier shall prepare and adopt a water shortage contingency plan (WSCP). The WSCP shall be included in the 2020 UWMP but is to be adopted separate from the UWMP with the intent that it be updated as needed independently of the UWMP.

1.2.8 Seismic Risk

Pursuant to 10632.5, suppliers shall include a seismic risk assessment and mitigation in the UWMP to assess vulnerabilities of the supplier's facilities. The seismic risk assessment and mitigation plan shall be updated when the UWMP is updated.

1.3 Benefits of UWMP Reporting

UWMP reporting for the City is required by the state and is a critical document for ensuring that the City remains compliant with various regulations. Additionally, completion of a UWMP demonstrating that the City addresses the requirements of the CWC is necessary to be eligible for any Department of Water Resources (DWR) administered grant or loan. Completion of the most recent UWMP may also be required for other state funding.

Beyond establishing grant or loan eligibility the UWMP is intended to be a useful tool for the supplier and the public. Thoughtful preparation of the plan provides the supplier an opportunity for forward thinking and planning, ensuring that their water supply remains robust in the future and continues to meet the dynamic needs of its customers. Throughout plan preparation the City, other suppliers, and local and regional authorities are encouraged to coordinate with one another creating a greater understanding of the region's water demands, ultimately promoting mindful utilization of the state's water resources.

1.4 Plan Organization

This UWMP was prepared in part by use of guidance issued by DWR via the *Urban Water Management Plan Guidebook 2020* (Guidebook). Organization of the plan chapters closely follows the suggested organization in the Guidebook. Where appropriate, submittal tables provided by DWR are used to report data; these tables are denoted by the suffix, "DWR Table". Additional data reporting is done in City of Roseville Tables denoted by the suffix, "COR Table".

Chapter 2 Plan Preparation

This chapter provides an overview of the process by which the plan was prepared and the coordination that was carried out.

2.1 Basis for Preparing a Plan

The City of Roseville Water Utility (City) is a public water system (PWS), which is a system that provides drinking water for human consumption through pipes or other constructed conveyances. The City serves over 3,000 customers and delivers over 3,000 AF annually and as such is required to submit a UWMP. Metrics for total number of customers and volume of water supplied in the City's service area for 2020 are provided in DWR Table 2-1. The UWMP is required to be reviewed and updated every five years; preparation of this UWMP is an update to the most recent UWMP, adopted by the City of Roseville in 2016. As a water retail supplier, the City is also required to comply with the requirements of SB X7-7. This UWMP establishes the City's compliance with the Urban Water Management Planning Act and SB X7-7.

DWR Table 2-1

Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
3110008	City of Roseville	46,112	30,445
	TOTAL	46,112	30,445
NOTES: All volumes are in AF. Units of measure remain consistent throughout the UWMP as reported in DWR Table 2-3.			

2.2 Individual or Regional Planning and Compliance

The CWC provides mechanisms for participating in area-wide regional, watershed or basin-wide urban water management planning. Per *Department of Water Resources Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (DWR Methodologies), water suppliers who receive water from a shared wholesale supplier may form a regional alliance. Although the City and its neighboring water suppliers practice regional water supply planning, the City has not formed a regional alliance with other water suppliers for compliance with SB X7-7. The City has prepared an individual UWMP, reporting solely on its own distribution service area and will not adopt a Regional Urban Water Management Plan (RUWMP), stated in DWR Table 2-2.

DWR Table 2-2

Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

2.3 Fiscal or Calendar Year and Units of Measure

General metrics for plan preparation are provided in DWR Table 2-3.

DWR Table 2-3

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP (select from drop down)	
Unit	AF

2.4 Coordination and Outreach

This section discusses the City's coordination with other agencies and the public.

2.4.1 Wholesale and Retail Coordination

Pursuant to CWC Section 10631(j) the City is to coordinate with wholesale supply agencies that provide the City with water. The City has water supply contracts with Placer County Water Agency (PCWA), San Juan Water District (SJWD), and the U.S. Bureau of Reclamation (USBR). As a retail supplier the City has informed the three agencies

of projected water use in five-year increments for the next 20 years. Documentation of this coordination is provided in Appendix A. DWR Table 2-4 lists those three agencies that the City has coordinated with.

DWR Table 2-4

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
U.S. Bureau of Reclamation
Placer County Water Agency
San Juan Water District

2.4.2 Coordination with Other Agencies and the Community

The City has actively sought to coordinate preparation of the UWMP with local and regional agencies and the general public. The City recognizes that how it currently utilizes and plans to utilize its water supply affects not only its own customers, but customers served by neighboring water agencies and individuals or groups that rely on private wells. As the City is dedicated to the responsible and sustainable management of local and regional water resources it has invited participation from the agencies listed in COR Table 2-A. Documentation of this coordination is provided in Appendix B. On February 16, 2021, the City noticed the neighboring cities and counties that preparation of the 2020 UWMP update had begun. Additionally, the City will hold a public hearing on June 16, 2021 to introduce the 2020 UWMP to the public and solicit feedback and answer questions regarding the plan.

COR Table 2-A Outreach with Local and Regional Agencies

Agency Name	Agency Type
U.S. Bureau of Reclamation	Wholesale Supplier
Placer County Water Agency	Water Supplier
San Juan Water District	Water Supplier
California American Water	Water Supplier
Citrus Heights Water District	Water Supplier
Sacramento Municipal utility District	Water Supplier
Sacramento Suburban Water District	Water Supplier
City of Roseville, City Manager	Local City
Placer County Public Works Department	Local County
Placer County Community Development Resource Agency	Local County
Regional Water Authority Sacramento	Regional Organization

Chapter 3 System Description

This chapter provides a description of the system including information on the distribution system; service area boundary; service area climate; service area population, demographics, and socioeconomics; and land uses within the service area.

3.1 General Description

The City of Roseville Water Utility (City) is a public utility owned and operated by the City of Roseville, which is on the interstate 80 corridor, approximately 15 miles northeast of downtown Sacramento California. The City obtains its surface water from Folsom Lake through wholesale purchase primarily from the United States Bureau of Reclamation (USBR) and additional water contracts with Placer County Water Agency (PCWA) and San Juan Water District (SJWD). The City also maintains and operates several production well sites that provide additional water supply reliability to the City with plans to construct more.

3.1.1 Transmission

The City has a diversion capacity of 150 cubic feet per second (cfs) or 96 million gallons per day (MGD) at Folsom Dam. From the pump station raw water is conveyed through parallel pipelines; the original 84-inch diameter pipeline constructed at the same time as the pump station and a 72-inch diameter pipeline completed in 2010 as a joint effort between the City and other water purveyors. The common facilities split at the "Hinkel Y", and thereafter raw water is conveyed through parallel pipelines – a 60-inch diameter pipeline and a 48-inch diameter pipeline – to the City's water treatment plant.

3.1.2 Water Treatment

The City's single water treatment plant (WTP), located within the City but in the Granite Bay area, has a capacity of 100 MGD. There are no plans to expand the WTP as the WTP is sized just above the pumping capacity of the Folsom Dam pump station. The WTP is a conventional treatment plant. The treatment processes include flocculation and sedimentation, clarification, filtration, and disinfection. The treatment train, beginning with the intake at Folsom Lake, is shown in Figure 3-1.

Sedimentation takes place in three parallel clarifiers. The chemicals injected as part of the flocculation and sedimentation processes are caustic soda, alum, and a cationic polymer. Sedimentation takes place in three separate parallel clarifiers. There are 12 anthracite sand filters, which combined have a maximum filtration rate of about 83,000 gallons per minute (gpm). The clear wells have a total volume of 358,500 gallons. Disinfection is achieved using sodium hypochlorite. The City also adds fluoride to treated water at a concentration of 0.7 parts per million (ppm) prior to distribution.

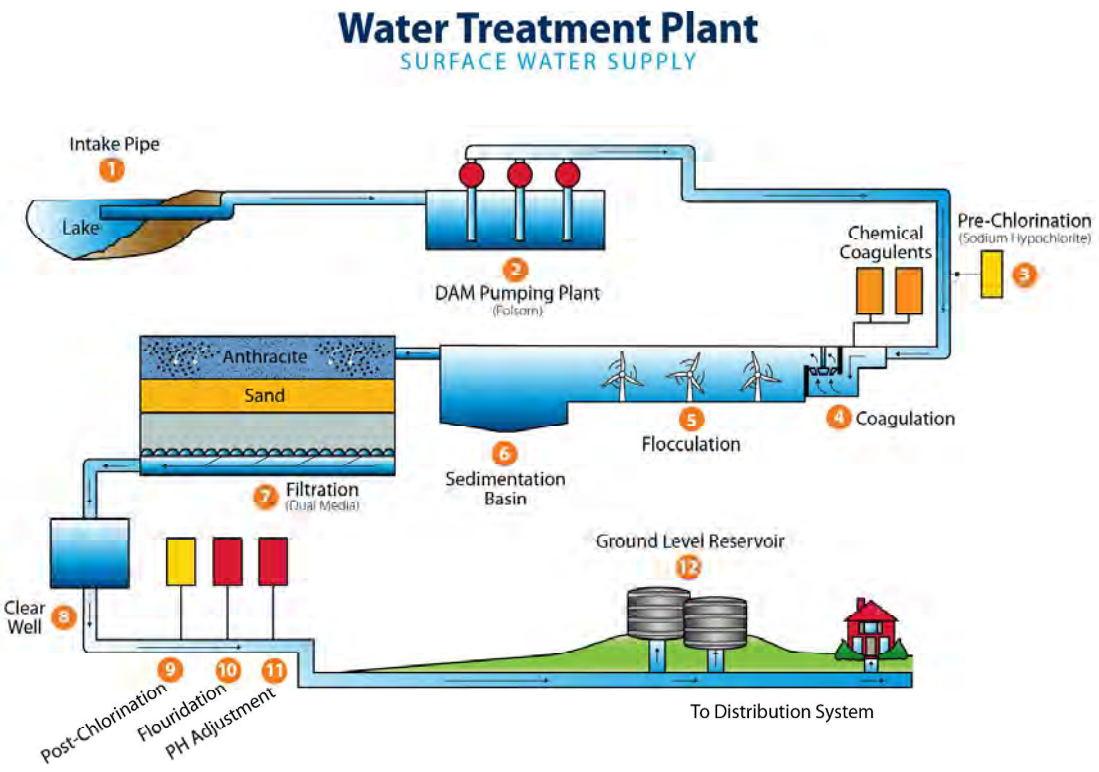


Figure 3-1. City of Roseville Water Treatment Plant Treatment Train

3.1.3 Storage

The City currently utilizes 6 potable water storage tanks, which are critical for maintaining water supply and system pressure during typical demand fluctuations, peak demand fluctuations, and emergency demands. The six water storage tanks have a total nominal capacity of 32 million gallons (MG). The City is also actively constructing two additional water storage tanks which will add a combined capacity of 12 MG, bringing the total storage capacity to 44 MG. The capacity of each tank is listed in COR Table 3-A.

COR Table 3-A Potable Water Storage Tanks

Facility	Existing or Future	Year Constructed	Type	Pressure Zone Served	Capacity (MG)
WTP	Existing	1971	Steel	1, 2, 4, 5	2
WTP	Existing	1990	Pre-Stressed Concrete	1, 2, 4, 5	4
WTP	Existing	2004	Pre-Stressed Concrete	1, 2, 4, 5	6
Northeast	Existing	1998	Pre-Stressed Concrete	1, 2, 4, 5	10
Northeast	Existing	2009	Pre-Stressed Concrete	1, 2, 4, 5	7.25
Halverson	Existing	2008	Pre-Stressed Concrete	2	2.9
West Side	Future	2022	Pre-Stressed Concrete	4	12

3.1.4 Distribution Network

The City maintains a distribution network consisting of approximately 600 miles of pressure pipe ranging from 1 inch to 72 inches in diameter. The network of pipe delivers potable water from the WTP to the City's customers to meet water demands during average day, maximum day, and peak hour conditions. The City aims to operate its system at a minimum pressure of 50 pounds per square inch (psi). Under existing conditions, the City mostly meets the minimum pressure criterion, with few instances where the minimum criteria are not met. These instances are not considered to be significant enough to impact the quality of customer's water service.

There are several specific plans for the City of Roseville which are in the process of being developed or will be developed in coming years. The City will serve these customers through new facilities which were designed during project development and that will be constructed by the developer and incorporated into the City's distribution network. The West Side Tank site will include a pump station with a pumping capacity of 20 MGD at the end of this construction phase, which is anticipated to be completed in 2022, but is designed to have a maximum capacity of 26.6 MGD at buildout. The existing and planned pump stations are summarized in COR Table 3-B.

COR Table 3-B Potable Water Pump Stations

Facility	Existing or Future	Pressure Zone Served
Dual Purpose Pump Station	Existing	1, 2
Highland Reserve North Pump Station	Existing	5
Pleasant Grove Pump Station	Existing	1
Pacific Fruit Express (PFE) Pump Station	Existing	Emergency Intertie
West Side Pump Station	Future	4

3.1.5 Groundwater Wells

The City currently operates 6 groundwater wells, which have a combined capacity of approximately 17,500-acre feet per year (AF/yr) or 15.6 MGD. Capacities of each operational well site are listed in COR Table 3-C. During the 2015 drought the water level in Folsom Lake was the lowest on record, which resulted in fluctuations in water supply. Consequently, the City sought to expand the existing ground water supply program to decrease reliability on Folsom Lake and to provide flexibility. To do so the City plans to utilize Aquifer Storage and Recovery (ASR) technology. ASR is the recharge of water in an aquifer through specially designed groundwater wells and recovery of water from that same well or others after time has passed. During times when there are excess surface water supplies, surface water can be injected using the ASR production wells and extracted during dry periods or when additional surface water is needed for the environment or other beneficial needs. Four of the existing operational wells have ASR capabilities, and the City plans to construct 6 additional wells with ASR capabilities by 2035.

COR Table 3-C Existing Operational Wells

Facility	Install/Rehab Date	Well Depth (Feet)	Zone Served	Pumping Capacity (MGD)
Darling Way, No. 4	1958/ 1999	303	1	1.3
Oakmont, No. 5	1978/ 1999	360	1	2.1
Diamond Creek, No. 6	2002	460	4	4.0
Woodcreek North, No. 7	2008	440	1	2.2
Hayden Parkway, No. 8	2015	520	4	3.1
Blue Oaks Boulevard, No. 12	2015	490	4	3.2

3.1.6 Interties

There are 17 interties with the surrounding jurisdictions of PCWA, SJWD, California-American Water Company (Cal-Am), Citrus Heights Water District (CHWD), and Sacramento Suburban Water District (SSWD). Each intertie is listed in COR Table 3-D.

COR Table 3-D Interties with Neighboring Water Suppliers

Intertie Agency	Facility	Year Constructed	Operational Control Agency	Control Valve Size (Inches)	Agency Receiving Water	Avg. Days/ Yr. Utilized 2015-2020	Days Utilized 2020
SJWD	WTP	1996	Roseville	16	Roseville	>1	0
	Eureka	1999	Roseville	12	Roseville	0	0
	Cavitt Stallman	1999	Roseville	12	Roseville	0	0
PCWA	Five Star	1995	PCWA	12	Roseville	0	0
	Stoneridge	1998	Roseville	12	PCWA	274	274
	Highland Park	2000	Roseville	12	PCWA	0	0
	Pleasant Grove	2000	PCWA	12	Roseville	0	0
	Industrial – Tinker	1989	Roseville	16	Roseville	361	361
	Bianchi Estates	2000	PCWA	12		365	365
Cal-Am	Crowder	2001	Cal-Am	12	Cal-Am	365	365
	PFE	2005	Roseville	16	Cal-Am	354	365
	Vernon Oaks	1988	Roseville	12	Cal-Am	0	0
	Vineyard Rd	1990	Cal-Am		Cal-Am	365	365
CHWD	Orlando	1989	Roseville	6	CHWD	0	0
	Blossom Hill	1986	Roseville	10	CHWD	0	0
	Fairway	2017	Roseville	8	CHWD	0	0
SSWD	PFE/ North Antelope	2005	Roseville	20	Both	0	0

3.1.6.1 San Juan Water District Interties

The three interties that exist between the City and SJWD under normal operations remain closed and are only intended for emergency use. The intertie at the WTP delivers water from SJWD to the City only. The Eureka and Cavitt Stallman interties deliver water to and from the City.

3.1.6.2 Placer County Water Agency Interties

All interties between the City and PCWA, except for the Bianchi estates intertie, can deliver water into the City. The Highland Park and Pleasant Grove interties cannot deliver water from the City to PCWA, but the other four remaining interties can. Through these interties a maximum of 11.5 MGD can be delivered to the City and 12.0 MGD can be delivered to PCWA. Three of the six PCWA interties under normal operations remain opened. The Stoneridge intertie regularly pumps water from the City to PCWA. The Bianchi Estates intertie is regularly kept open as it feeds PCWA's Bianchi Estates system and is the only source of supply for that area. The Industrial- Tinker intertie is normally open in order to deliver water from PCWA to Cal-Am through the Crowder and PFE interties.

3.1.6.3 California American Water Company Intertie

Only the PFE intertie can deliver water to the City and is intended for emergency use with a maximum capacity of 3.5 MGD. Both the Crowder intertie and Vineyard interties cannot deliver water to the city. All three interties can deliver water from the City to Cal-Am and are normally open with a total maximum capacity of 8.35 MGD. The water that is delivered to the Crowder and Vineyard Rd interties is from the PCWA Tinker intertie.

3.1.6.4 Citrus Heights Water District

The three interties between the City and CHWD can all be used to deliver water to and from the City. All three are intended for emergency use and under normal operating conditions remain closed.

3.1.6.5 Sacramento Suburban Water District Intertie

The intertie between the City and SSWD is part of regional development of conjunctive use programs. During an emergency or drought years, the PFE pump station will pump water from SSWD's service area into zone 1 of the City. Likewise, this intertie can be used to deliver water from the City to SSWD. A mutual aid agreement between the City and SSWD is currently being developed.

3.2 Service Area

The City's service area boundary lies within the limits of the City of Roseville. There are a few small areas within the city limits that are served by PCWA, SJWD, and CHWD. The service area is approximately 3,150 acres (ac). The service area and the facilities mentioned in section 3.1 are shown in Figure 3-2.

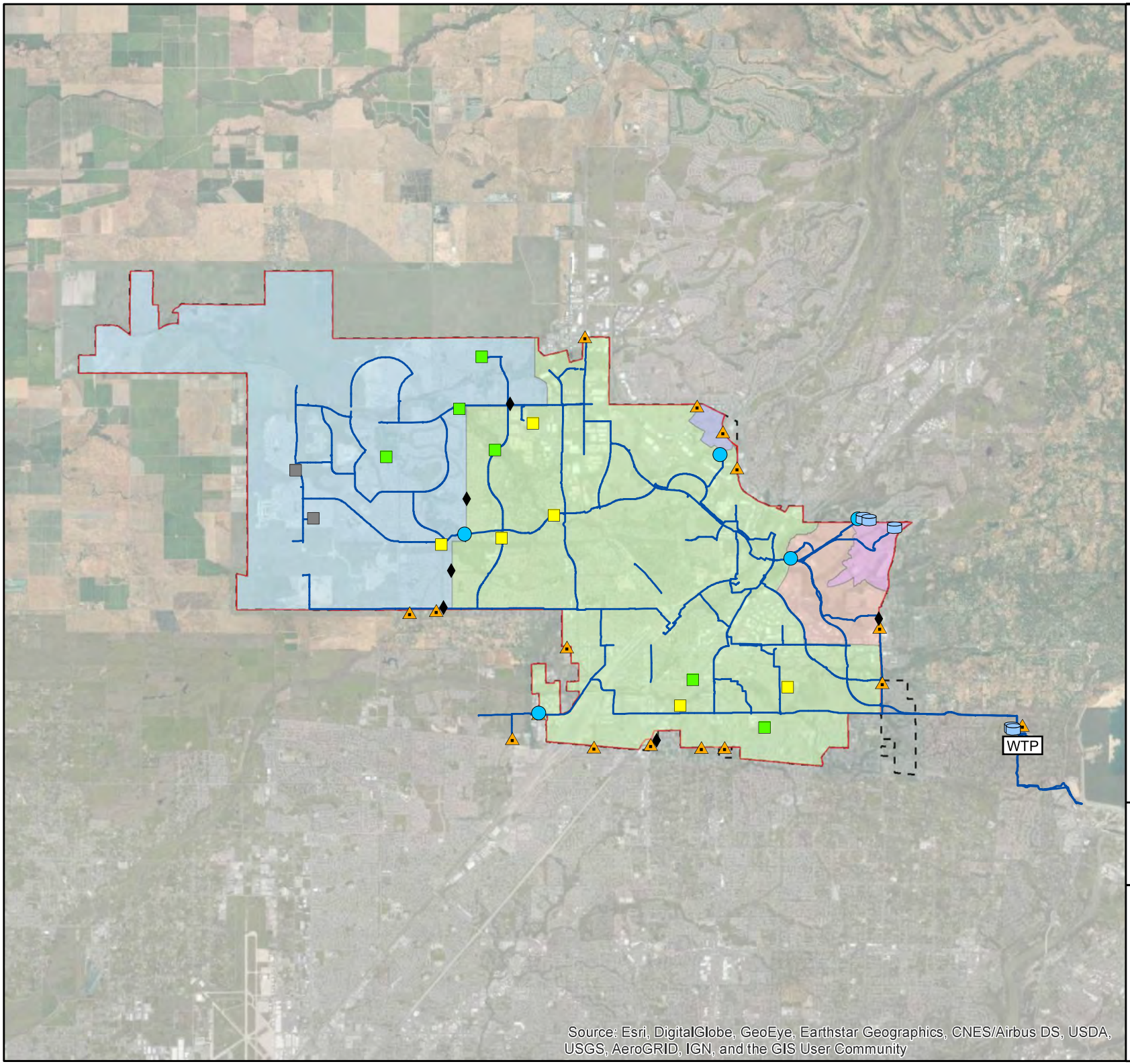


Figure 3-2 Service Area Map

WATERWORKS ENGINEERS

CITY OF ROSEVILLE CALIFORNIA

3.3 Service Area Climate

The service area experiences cool and humid winters and hot and dry summers. The City of Roseville's climate is similar to the City of Sacramento, which is in close proximity. Historical climate data was obtained from California Irrigation Management Information System (CIMIS) for station 155, which is located in Sacramento, for the reporting period of this UWMP and is summarized in COR Table 3-E. The average monthly temperature from 2016 to 2020 ranged from 39.8 degrees Fahrenheit (°F) to 95.1 °F. Typically the wet season begins in October and ends in May, with an average annual total precipitation of 13.3 inches.

COR Table 3-E Monthly Average Climate Data from 2016 through 2020

Month	Average Minimum Temperature (°F)	Average Maximum Temperature (°F)	Average Temperature (°F)	Average Monthly Precipitation (inches)
January	42.7	56.3	49.5	3.6
February	42.5	61.7	52.1	1.7
March	46.3	64.7	55.5	2.3
April	50.6	73.3	62.0	0.8
May	54.2	80.6	67.4	0.8
June	59.2	90.5	74.9	0.0
July	60.9	95.1	78.0	0.0
August	61.3	92.4	76.9	0.0
September	58.9	87.5	73.2	0.0
October	51.7	78.2	65.0	0.7
November	44.7	65.0	54.9	1.2
December	39.8	56.7	48.3	2.1
Averages	51.1	75.2	63.1	1.1

3.4 Service Area Population and Demographics

This section describes the population, demographic, and employment conditions of the City's water service area during the reporting period of the UWMP as well as future projections through 2045.

3.4.1 Service Area Population

Water use is directly tied to a service area's population and analyzing population growth and development trends is critical for the City's planning of water distribution facilities and infrastructure. Current and projected service area population estimates are provided in DWR Table 3-1. These projections differ from total population as a small number of City residents are served by adjacent water purveyors. The projections were estimated in coordination with the City of Roseville's General Plan, direct input from the City of Roseville's Planning Division, and previous studies performed by the City's Environmental Utilities Division. Methods for estimating population projections are further discussed in 5.2.

DWR Table 3-1

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045
	140,187	151,742	170,526	193,190	193,190	193,190

3.4.2 Social, Economic, and Demographic Factors

The City of Roseville's population in 2019, according to the American Community Survey (ACS), was reported to be 68.2% White alone (not Hispanic or Latino), 14.5% Hispanic or Latino, 10.1% Asian alone, 2.8% Black alone, and all other race categories were less than 1%. A summary of all race categories surveyed is provided in COR Table 3-F. The United States Census Bureau reports that the median household income from 2015-2019 was $89,082. ACS reports that in 2019 8.4% of the population was in poverty and 16.5% of the population was 65 years of age and over. The social, economic, and demographic factors are not believed to affect water management and planning.

COR Table 3-F City of Roseville 2019 Population by Race

Race Category	Percentage
American Indian and Alaska Native alone, not Hispanic or Latino	0.3%
Asian alone, not Hispanic or Latino	10.1%
Black alone, not Hispanic or Latino	2.8%
Hispanic or Latino	14.5%
Native Hawaiian and other Pacific Islander alone, not Hispanic or Latino	0.1%
White alone, not Hispanic or Latino	68.2%
Some other race alone, not Hispanic or Latino	0.0%
Two or more races alone, not Hispanic or Latino	3.9%

3.5 Land Uses within the Service Area

A new requirement of the California Water Code, since the 2015 UWMP was published, requires that land use projections be coordinated with other local and regional land use authorities.

> *California Water Code 101631.*
>
> *(a) The description shall include the current and projected land uses within the existing or anticipates service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.*

In August 2020, the City of Roseville completed its update to the General Plan, with a planning horizon that extends into 2035. The General Plan includes the Land Use Element, which is provided in Appendix C. The Land

Use Element discusses existing and future land use conditions, with an intended purpose of setting guidelines for managing land use change. The City of Roseville has both residential and non-residential land uses; density and intensity guidelines for each land use type respectively are set forth in the Land Use Element. The land use categories as well as corresponding characteristics from the Land Use Element are summarized in COR Table 3-G and COR Table 3-H.

COR Table 3-G Residential Land Uses and Development Guidelines

Land Use Category	Dwelling Units Per Acre	Estimated Population Per Gross Acre
Low-Density Residential (LDR)	0.5 – 6.9	1.45 – 20.1
Medium-Density Residential (MDR	7.0 – 12.9	20.3 – 37.41
High-Density Residential (HDR)	≥ 13	≥ 27.3

COR Table 3-H Non-Residential Land Uses and Development Guidelines

Land Use Category	Floor to Area Ratio
Neighborhood Commercial (NC)	20% - 40%
Community Commercial	20% - 40%
Regional Commercial	20% - 40%
Business Commercial	20% - 40%
Light Industrial	20% - 50%
Tech/ Business Park	20% - 50%
General Industrial	20% - 50%
Transfer Station	Varies
Central Business District	≤ 300%
Public/ Quasi-Public	Varies

Chapter 4 Water Use Characterization

This chapter provides a description and quantification of the City's past and current water use and future water use projections through the year 2045. Projections provided herein were coordinated with other local and regional planning documents in an effort to develop reliable water use projections.

4.1 Non-Potable Versus Potable Water Use

The City utilizes both potable and non-potable water to meet the diverse water needs of the customers within the service area. Potable water is water that is safe to drink and meets all California drinking water regulations per Title 22. The City's potable water supplies consist of surface water treated at the WTP, groundwater from various wells throughout the City that is chemically treated on site, finished water wheeled from other agencies through interties, and raw water received from other agencies through interties which is subsequently treated at the WTP.

Additionally, the City supplies recycled water, which is non-potable water for approved uses. Recycled water is wastewater that is treated to Title 22 disinfected tertiary standards. The City operates two wastewater treatment plants (WWTPs), Dry Creek and Pleasant Grove, both of which treat wastewater to the high standard required of recycled water. The recycled water produced at the WWTPs is distributed in a separate system from the potable water system and is utilized for landscape irrigation, environmental releases, cooling water, and construction uses.

Lastly, the City delivers raw water, which is also non-potable, to Linda Creek outside of the City's service area. Raw water is untreated water that is used in its natural state or with minimal treatment. The City is required to discharge 404 AF to Linda Creek as part of its instream flow commitment. The City does not deliver raw water to any of its customers within the service area.

4.2 Past, Current, and Projected Water Use by Sector

The following sections describe and quantify past, current, and projected water use. Water uses are delineated by various sectors. Additionally, the new requirement of the 2020 UWMP requiring quantification of system water losses for the five years preceding this plan are reported as follows.

4.2.1 Water Use Sectors Listed in Water Code

Water Code Section 10631(d) requires that water uses be identified for at least the ten following sectors; definitions for each of the sectors are adapted from those provided in the Guidebook.

- **Single-family residential** – A single family dwelling unit. A lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling. This is a retail demand.
- **Multifamily** – Multiple dwelling units contained within one building or several buildings within one complex. This is a retail demand.
- **Commercial** – A water user that provides or distributes a product or service. Water Code 10608.12(d). This is a retail demand.
- **Industrial** – Water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS) code sectors 31 to 33, inclusive, of an entity that is a water user primarily engaged in research and development. Water Code Section 10608.12(h). This is a retail demand.

- **Institutional and governmental** – A water user dedicated to public service. This type of user includes, among other users, higher-education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions per Water Code Section 10608.12(i). This is a retail demand.
- **Landscape** – Water connections supplying water solely for landscape irrigation. Such landscapes may be associated with multi-family, commercial, industrial, or institutional/governmental sites, but are considered a separate water use sector if the connection is solely for landscape irrigation. This is a retail demand.
- **Sales to other agencies** – These are water sales made to another agency. Projected sales may be based on projected demand provided by the receiving water supplier. This is a wholesale demand.
- **Saline Water Intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof** – *Conjunctive use* is a water management strategy where surface water and groundwater are managed together to increase the total water supply. For purposes of the UWMP, conjunctive use is seen as a management strategy rather than as a water use. This type of water use is best reported as groundwater recharge. *Groundwater recharge* can occur through both natural and artificial means. In the context of this UWMP, artificial groundwater recharge is the managed and intentional replenishment of natural groundwater supplies using techniques such as infiltration basins or injection wells. Water used for groundwater banking or storage may also be reported using this sector. If all, or a portion of, the groundwater recharge is subsequently pumped out of the basin in the same year, that water is reported as a supply from groundwater. *Saline water intrusion barrier* is the practice of injecting water into a freshwater aquifer to prevent the intrusion of saltwater. These may be either a wholesale or retail demand. The City currently does not have any demands under this water use sector.
- **Agricultural** – Water used for commercial agricultural irrigation. Water used for processing agricultural products (e.g., food, beverage, or textile manufacturing) may also be considered industrial process water. This may be either a wholesale or retail demand. The City currently does not have any demands under this water use sector.
- **Distribution system water losses** – Losses that were reported in accordance with the 12-month water loss for each of the prior five years.

4.2.2 Water Use Sectors in Addition to Those Listed in Water Code

Presently, the City has no additional water use sectors outside of the ten listed in CWC. Furthermore, the City expects that future water use will be restricted to the same sectors by which water is currently used based on land use projections from the Land Use Element.

4.2.3 Past Water Use

Past potable water use by sector was analyzed to estimate water use projections into the next 25 years, as required by the CWC. By examining past water use, trends can be understood such as, effects of temporary use restrictions during drought years, effects of long-term demand management measures, and the changing profile of service connections by water use sector. Past water uses from the last two UWMP years, 2010 and 2015, as well as the five years preceding this plan are summarized in COR Table 4-A.

COR Table 4-A Past Potable Water Use Volumes by Sector.

Water Use Sector	2010	2015	2016	2017	2018	2019
Commercial	2,042	1,930	2,101	2,218	2,565	3,021
Industrial	891	934	954	921	797	276
Institutional and Governmental	667	561	650	770	384	393
Multi-Family	2,196	1,464	1,556	1,569	1,376	1,358
Single-Family	15,836	11,680	13,215	14,674	15,303	15,387
Landscape	5,534	4,152	4,691	5,491	5,656	5,974
Other (1)	272	–	–	–	–	–
Total	27,438	20,721	23,176	25,643	26,081	26,409
NOTES: (1) In 2015 and subsequent years thereafter, all water demands are characterized by water use sectors defined in the CWC. All Volumes are in AF.						

4.2.4 Current Water Use

The City's potable and non-potable water uses for 2020 by sector are reported in DWR Table 4-1. There are no existing potable or non-potable demands for the use types of saline barriers, conjunctive use, or agricultural.

DWR Table 4-1

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable Water - Actual			
Use Type	2020 Actual		
Water Use Sector	Additional Description	Level of Treatment	Volume
Commercial	Including non-metered	Drinking Water	2,630
Industrial	Including non-metered	Drinking Water	254
Institutional/Governmental	Including non-metered	Drinking Water	412
Multi-Family	Including non-metered	Drinking Water	1,416
Single Family	Including non-metered	Drinking Water	17,115
Landscape	Including non-metered	Drinking Water	6,422
Losses	Including non-metered	Drinking Water	1,600
Sales/Transfers/Exchanges to other Suppliers	Including non-metered	Drinking Water	1,451
Groundwater recharge	Excludes groundwater pumped and supplied to distribution system.	Drinking Water	597
Sales/Transfers/Exchanges to other Suppliers	Discharge to Linda Creek and water wheeled on behalf of SJWD	Raw Water	404
		TOTAL	32,300
NOTES: All volumes are in AF. Losses are for potable water only. The 2020 Water Audit has not been validated at the time of plan preparation and final losses reported in the validated Water Audit may differ.			

4.2.5 Projected Water Use

The City frequently completes studies aimed at understanding future water use demands to determine the reliability of system supplies and identify and plan for any vulnerabilities. As stated in 3.4.1, the service area population directly impacts water use demands. To estimate projected water use through 2045, the following approach and resources were utilized:

Assumptions:

- The Planning Division's population projection from the 2020 General Plan Land Use Element was utilized, which estimates a population of 198,000 at buildout of all planned development.
- Based on coordination with the City of Roseville's Planning Division, assumed that all planned development would be complete by 2035.
- Assumed that the population past 2035 would remain constant at 198,000 through 2045.
- An estimated 1,843 dwelling units in the City of Roseville are not served by the City. The number of dwelling units are estimated based on other utility accounts.

Population Projection and Water Use Projection Steps

1. Calculated the population not served by the City by multiplying the number of dwelling units and California Department of Finance (CDoF) household multiplier.
2. Subtracted the population not served by the City from the total CDoF City of Roseville population to obtain the service area population for 2016 through 2020.
3. Estimated the current percentage of development for each specific plan from aerial imagery.
4. Input current percentage of development into the City of Roseville's Environmental Utilities (EU) Department's Water Demand Tracking Tool, which calculates buildout water usage for each specific plan. Water use in the Tool is calculated by applying unit demand factors, specific to land use categories, to each of the dwelling units Demand factors and total water use for all specific plans are provided in COR Table 4-B and COR Table 4-C, respectively.
5. Plotted the service area population from 2016 through 2020 and the projected population for 2035 to approximate the population for 2025 and 2030 (Figure 4-1). The resultant population projections were previously summarized in DWR Table 3-1.
6. Updated the Water Demand Tracking Tool development percentage for 2025 and 2030 to reflect population projections and for 2035 to reflect 100% at buildout.

COR Table 4-B Unit Demand Factors for Land Use Type

Residential Land Use Categories	Unit Demand Factor (gpd/DU)
Low Density Residential 1 – LDR1 (<3.5 DUs/Acre)	728
Low Density Residential 2 – LDR2 (3.5 to 5 DUs/Acre)	600
Low/Medium Density Residential 1 – LMDR1 (>5 to 6 DUs/Acre)	521
Low/Medium Density Residential 2 – LMDR2 (>6 to 8 DUs/Acre)	430
Medium Density Residential – MDR (>8 to 12 DUs/Acre)	323
High Density Residential – HDR1 (>12 to 16 DUs/Acre)	288
High Density Residential – HDR2 (>16 DUs/Acre)	177
Non-Residential Land Use Categories	**Unit Demand Factor**
Community Commercial/Retail	2598
Business Professional	2598
Light Industrial	2598
Industrial	2562
Railyard	109
Elementary School	3454
High School	4069
Public/Quasi Public	1780
Parks	2988
Open Space/Right of Way	0

COR Table 4-C Specific Plan Water Demands at Buildout by Water Use Sector.

Specific Plan	Commercial (AF/yr)	Industrial (AF/yr)	Institutional/ Governmental (AF/yr)	Multi-Family (AF/yr)	Single Family (AF/yr)	Landscape (AF/yr)	Total (AF/yr)
Infill	2,232	2,625	6,070	552	8,898	0	20,377
DTRSP	780	7	124	15	92	0	1,018
RSGW	83	0	0	34	57	0	173
SE	530	0	441	393	1,270	0	2,633
NE	1,769	0	65	0	474	0	2,309
STRSP	115	0	335	148	1,481	0	2,079
NCRSP	1,457	226	546	444	1,610	0	4,283
HRNSP	470	0	312	180	701	0	1,663
NWRSP	378	0	1,596	338	4,847	0	7,159
DWSP	37	0	1,273	20	2,056	0	3,386
NI	220	3,718	195	99	826	0	5,057
NRSP	225	0	644	165	2,859	0	3,893
WRSP	231	255	1,465	615	5,648	1,074	9,289
SVSP	623	0	499	335	2,538	0	3,995
CVSP	56	0	88	108	745	0	997
ARSP	150	0	110	187	940	0	1,386

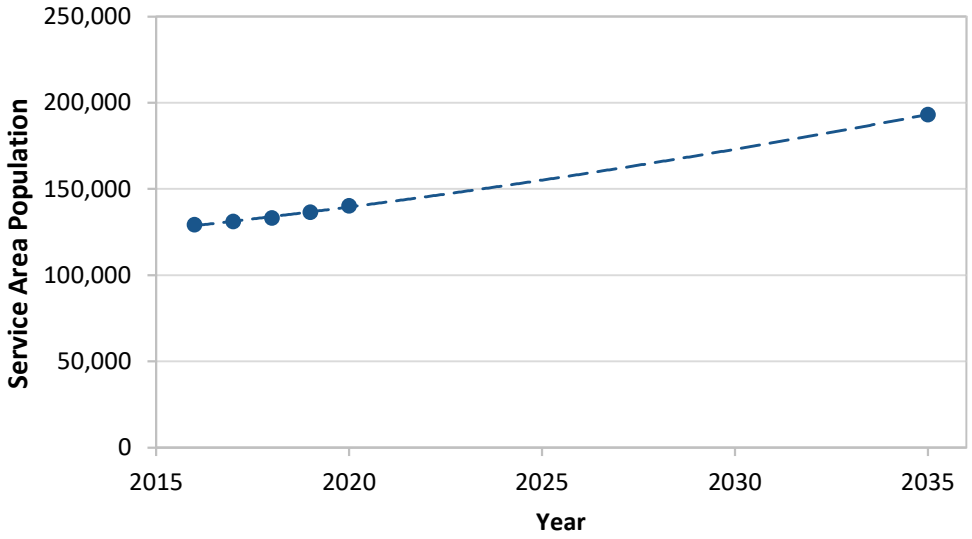


Figure 4-1 Existing and Projected Service Area Population

DWR Table 4-2

Submittal Table 4-2 Retail: Use for Potable and Non-Potable Water - Projected

Use Type	Additional Description (as needed)	Projected Water Use				
		2025	2030	2035	2040	2045
Commercial	Potable water, including non-metered	6,135	6,508	7,017	7,017	7,017
Industrial	Potable water, including non-metered	4,175	4,726	5,123	5,123	5,123
Institutional/Governmental	Potable water, including non-metered	8,904	9,494	10,321	10,321	10,321
Multi-Family	Potable water, including non-metered	1,752	2,029	2,725	2,725	2,725
Single Family	Potable water, including non-metered	22,564	24,508	26,281	26,281	26,281
Landscape	Potable water, including non-metered	644	765	805	805	805
Losses	Potable water	1,429	1,401	1,587	1,587	1,587
Sales/Transfers/Exchanges to other Suppliers	Potable water, including non-metered	0	0	0	0	0
Groundwater recharge	Potable water	1,560	2,720	3,350	3,350	3,350
Sales/Transfers/Exchanges to other Suppliers	Raw Water, Discharge to Linda Creek and water wheeled on behalf of SJWD	404	404	404	404	404
	TOTAL	50,572	47,567	52,555	57,614	57,614

NOTES: The city has no contracts for transfer for 2025 through 2045, as of yet. Projections are inclusive of lower income residential water demands. All values are in AF.

Total Gross water use projections, inclusive of recycled water, are provided in DWR Table 4-3. Recycled water demand is further characterized in DWR Table 6-4 of Chapter 6

DWR Table 4-3

Submittal Table 4-3 Retail: Total Gross Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045
Potable Water, Raw Water	32,300	47,567	52,555	57,614	57,614	57,614
Recycled Water Demand	3,768	4,022	4,435	4,933	4,933	4,933
TOTAL WATER USE	36,068	51,589	56,990	62,547	62,547	62,547
NOTES: All values are in AF. Values include potable and non-potable water use.						

4.2.6 Distribution System Water Losses

Distribution system water losses are the difference between the volume of water that is delivered into the potable drinking water distribution system and actual consumption. Losses are always present in a water system due to pipe leaks, unauthorized connections or use, faulty meters, and unmetered institutional and governmental water use. Each year the City characterizes its water loss in accordance with the American Water Works Association (AWWA) Water Audit Method. CWC requires urban retail water suppliers to conduct and submit validated water loss audit reports annually to DWR on October 1st following the reporting year. Final Water Audit and Validation Reports are available for 2016 through 2019 and provided in Appendix D. As the UWMP is required to be submitted prior to the due date of the Water Audit, values for 2020 stated herein are approximate and may be altered in the final submission of the 2020 Water Audit. Distribution system water losses for five years preceding the plan update from 2015-2019 are summarized in COR Table 4-D and estimated water loss for 2020 is given in DWR Table 4-4.

COR Table 4-D 12 Month Water Loss Audit Reporting for 2015-2019.

Reporting Period Start Date (mm/yyyy)	Volume Water Loss (AF)
01/2015	2,127.52
01/2016	2,330.47
01/2017	2,682.94
01/2018	2,140.95
01/2019	1,865.24

DWR Table 4-4

Submittal Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date	Volume of Water Loss*
01/2020	1,599.23
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: All Volumes are in AF. The 2020 Water Audit has not been validated at the time of plan preparation and final water losses reported in the validated Water Audit may differ.	

An update to the CWC requires that 2020 UWMPs and all UWMPs submitted thereafter include data showing whether the urban retail water supplier met the distribution loss standards enacted by the California State Water Resources Control Board (SWRCB) pursuant to Section 10608.34. At the time of plan preparation, the SWRCB has not adopted performance loss standards. Proposed water loss performance standards will set a maximum allowable water loss in gallons per connection per day for the City. The proposed baseline water loss is an average of the 2017 through 2019 water loss and is calculated to be 41.0 gallons per connection per day and the proposed performance standard to be met by 2028 is 22.3 gallons per connection per day Appendix E. Water loss in gallons per connection per day for 2017 through 2020 is shown in COR Table 4-E.

COR Table 4-E Loss Reported in AWWA Water Audit for 2017-2019.

AWWA Loss Category	2017	2018	2019	2020 [(1)]
Apparent Loss	8.02	8.01	7.90	9.78
Real Loss	46.89	34.97	28.78	21.19
Water Loss	54.91	42.98	36.68	30.97
NOTES: All values are gallons per connection per day. [(1)] The 2020 Water Audit has not been validated at the time of plan preparation and final water loss reported in the validated Water Audit may differ.				

The data from 2017 through 2020 demonstrate that the City annually reduced water loss measured as gallons per connection per day. The City continues to prioritize and allocate resources to detecting and repairing leaks in the distribution to reduce water loss. Over the last five years the City has increased the accuracy of reported losses through a process of quantifying the City's authorized unmetered use of water for institutional and governmental operations, which had previously gone unquantified and were reported as water loss. These municipal functions include fire suppression, street sweeping, hydraulic utility excavation, and others. In dedicating resources to tracking and understanding these internal uses, consumption of water for these authorized uses has not been reduced or restricted and the services continue, as necessary. The City anticipates that it is on track to meet the performance standard by 2028.

Note that in DWR Table 4-2 the projected water loss in 2030 and thereafter was calculated by multiplying the performance standard by the estimated number of service connections and for 2025 an intermediate water loss

multiplier of 27.09 gallons per connection per day was used. 2025 through 2045 number of service connections were estimated using the same ratio of 2020 total number of service connections to 2020 population.

4.2.7 Estimating Future Water Savings

As noted in DWR Table 4-2 and the following DWR Table 4-5, water use projections do consider future water savings and lower income residential demands.

DWR Table 4-5

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	Yes
Sections where citations of the codes, ordinances, utilized in demand projections are found.	4.2.7.1 4.2.7.2 4.2.7.3
Are Lower Income Residential Demands Included in Projections?	Yes

The unit demand factors and resultant demands calculated by the EU department in COR Table 4-B and COR Table 4-C do not account for reduced demand from conservation measures. However, based on previous years' demand data, the City has observed that passive conservation measures have resulted in an approximate 25% reduced demand from what was projected. This 25% demand reduction is reflected in DWR Table 4-2 for the potable water use categories of Commercial, Industrial, Institutional/ Governmental, Multi-Family, Single Family, and Landscape. Conservation measures are described in the subsequent sections.

4.2.7.1 Compliance with Water Efficient Landscape Requirements

New development areas are required to reduce landscape area and calculated water demands as part of the process for land use approval, as required by the California Code of Regulations Title 23, Division 2 Chapter 2.7 Model Water Efficient Landscape Ordinance (MWELO). The City of Roseville's own standards have additional requirements for Water Efficient Landscaping, which can be found in Chapter 14.18 of the Roseville Municipal Code (available via the City's website).

4.2.7.2 Increased Utilization of Recycled Water

The City of Roseville requires recycled water to be used in most land use development areas currently being planned, and for construction water during drought years. Future required use includes landscaping associated with commercial, industrial, multi-family, parks, and transportation corridors. Guidelines for Recycled Water Service are outlined in Roseville Municipal Code Chapter 14.17 (available via City's website).

4.2.7.3 Implementation of Low Water Use Fixtures

Section 16.01.100 (A.) of the Roseville Municipal Code (available via City's website) states that: "The 2019 California Building Standards Code is hereby adopted by the City of Roseville Municipal Code."

Additionally, the mandatory CALGreen building standards code promotes conservation through the use of appliances and fixtures such as high-efficiency toilets, faucet aerators, and on-demand water heaters.

4.2.8 Characteristic Five-Year Water Use

The California Water Code Section 10635(a) requires that in addition to calculating water use projections over the next 20 years, in five-year increments, that suppliers perform a drought risk assessment lasting five consecutive years. The projected unconstrained demand for 2021-2025 is estimated in table COR Table 4-F. Unconstrained demand is demand absent any water supply or usage restrictions but does include the conservation practices for new construction, outlined in the previous section. This projection informs the drought risk assessment, which is detailed in Chapter 7 .

COR Table 4-F Five consecutive year unconstrained demand.

Gross Water Use	2021	2022	2023	2024	2025
Potable Water, Raw, Other Non-Potable	35,353	38,407	41,460	44,513	47,567
Recycle Raw Water Demand	3,819	3,870	3,920	3,971	4,022
NOTES: All volumes are in AF.					

4.3 Water Use for Lower Income Housing

Policy LU5.5, of the Land Use Element, strives to uphold the City of Roseville's Affordable Housing Goal by requiring that a minimum of 10% of all new housing units cost no more than 30% of the total monthly income of very low-, low-income, and moderate-income households. The City of Roseville EU Department annually coordinates with the Planning Division to gather data related to low-income housing metrics. The total number of affordable housing units in 2020 was 3,103, of which 633 were single family residences and 2,470 were multi-family residences. The water demands for low-income housing for 2020 were estimated by multiplying the number of single family and multi-family units by the average unit demand factor for low to medium density residential and high density residential, respectively, then reducing it by 20% to account for conservation efforts. These estimations are summarized in COR Table 4-G.

COR Table 4-G 2020 Affordable Housing Water Use

Unit Demand Factors	
Average Low to Medium Density Residential Factor for Single Family Units	520.4 (gpd/DU)
Average High Density Residential Factor for Multi-Family Units	232.5 (gpd/DU)
2020 Affordable Housing Water Use	
Single Family Residential	295 (AF/yr)
Multi-Family Residential	516 (AF/yr)
Total	645 (AF/yr)

As stated in DWR Table 4-5, the water use projections of DWR Table 4-2 are inclusive of water use for lower income households. The estimated water demand by sector for each specific plan, in COR Table 4-C, included affordable housing water use in the single family and multi-family water use calculations, which was used to derive the water use projections in DWR Table 4-2. The portion of water from those projections to be used by affordable housing units is shown in COR Table 4-H. As 10% of all new housing construction is required to be allocated to affordable housing, 10% of the difference between each of the five-year projections was added to the preceding period to estimate how much water would be used by low-income housing.

COR Table 4-H Affordable Housing Water Use Projections

Housing Type	2025	2030	2035	2040	2045
Multi-Family Residential	329	356	426	426	426
Single-Family Residential	1,061	1,255	1,433	1,433	1,433
Total Affordable Housing Units	1,390	1,612	1,859	1,859	1,859
NOTES: All values are in AF/yr.					

4.4 Climate Change Considerations

All projections included in Chapter 4 are representative of unconstrained demand except for passive conservation efforts described in 4.2.7. However, consideration of effects that climate change may have on demand projections and water supply and reliability is a critical aspect of ensuring that the City is well positioned to meet future demands. The City's primary water source is surface water from Folsom Lake and the City recognizes that the reliability of this source is reduced during dry years or a drought. A comprehensive study aimed at understanding how climate change will impact the American River Basin, from which the City receives its surface water supplies, was performed in 2020 and is included in Section 6.14.2. The effects of climate change on water supplies are considered in future plans for the groundwater program, a drought risk assessment, and a Water Shortage Contingency Plan**,** which are provided herein.

Chapter 5 SBX7-7 Baselines, Targets, and 2020 Compliance

With the adoption of the Water Conservation Act of 2009, also known as Senate Bill X7-7 (SB X7-7), the State of California is required to achieve a 20% reduction in urban per capita water use by December 31, 2020. Additionally, incremental progress towards meeting the goal was required to be demonstrated in the 2015 UWMP. The 2015 UWMP calculated gallons per capita per day (GPCD) water use and confirmed that the 2015 interim target was met, and that progress was being made toward meeting the water use target for 2020. This chapter summarizes baselines and targets, which were quantified in previous UWMPs, and confirms that the City's 2020 water use is compliant with SB X7-7 legislation.

5.1 Baselines and Targets

The City first addressed SB X7-7 in the 2010 UWMP, where baseline per capita water use, the 2015 interim target, and 2020 target were established and adopted. For the 2015 UWMP update the Department of Water Resources issued guidance that there were significant discrepancies between the CDoF estimated 2010 population and the 2010 population as determined by the 2010 U.S Census, which could result in poor baseline population estimates. Consequently, the City and other water suppliers were required to recalculate baseline population that had been reported in the 2010 UWMP and to modify the 2015 and 2020 targets accordingly.

SB X7-7 requires each urban water retailer to determine their baseline daily per capita water use measured in GPCD, over a 10-year or 15-year baseline period. The 10-year baseline period is defined as a continuous 10-year period ending no earlier than December 31, 2004 and no later than December 31, 2010. SB X7-7 also defines that for suppliers which met a minimum of 10% of their 2008 water demand through recycled water that the baseline could be extended to a maximum of a 15-year baseline period. Only 8.76% of the City's demand was met with recycled water in 2008, consequently the City used a 10 consecutive year period for its baseline. Additionally, SB X7-7 requires that a 5-year baseline per capita water demand be calculated over a 5 consecutive year period ending no earlier than December 31, 2007 and no later than December 31, 2010. Given the requirements the City used the following baseline periods:

- 10-year Baseline Period: 1995-2004
- 5-year Baseline Period: 2003-2007

Since the 2015 UWMP was completed, the City has experienced no changes to the service area that would require recalculation of baseline or targets; there have been annexations for new construction, but these do not trigger recalculation requirements. Baselines and targets are summarized in DWR Table 5-1. The 2015 SB X7-7 Verification Form, which provides tables for detailed calculations of baselines and targets, is provided in Appendix F.

DWR Table 5-1

Submittal Table 5-1 Baselines and Targets Summary from SB X7-7 Verification Form				
Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target
10-15 year	1995	2004	309	247
5 Year	2003	2007	295	

5.2 Service Area Population

To correctly calculate compliance water use in GPCD, the population served by the City must be calculated. The method for 2020 service area population was briefly described in Section 4.2.5 and is further explained herein. The 2020 U.S. Census data were not available at the time of plan preparation and could not be used for population estimates, as such the City of Roseville population for 2020 was obtained from CDoF.

The CDoF population estimate for cities utilizes ACS data to distribute the 2010 U.S. census housing units into CDoF's standard housing types. Number of housing unit estimates are respective of new construction, annexations, demolition, and conversions. CDoF coordinates with both local jurisdictions and the U.S. Census Bureau to obtain housing unit change data. For 2020, CDoF estimated that the total population for the City of Roseville was 145,163. However, there are a few areas in the City of Roseville that are not served by the City. The population of the area not served was estimated by determining the total number of households in those areas and applying the household multiplier. The number of households was approximated based on utility information from other City of Roseville departments and the household multiplier was obtained from CDoF. The resulting population for the areas not served by the City is 4,976 and this was subtracted from the CDoF total population to obtain a 2020 service area population of 140,187.

5.3 Gross Water Use

Annual gross water use is defined by the CWC as the volume of water, treated or untreated, that enters the distribution system except for the following: recycled water, the net volume of water placed into long term storage, water conveyed by the retailer for use by another supplier, water delivered for agricultural use, and process water for industrial use if industrial water use is a significant percentage of overall water use. The volume of recycled water used within the City's service area is reported separate from potable water and is excluded from all gross water use volumes reported herein. No other exclusions or deductions were used in the calculation of the baseline gross water use and so are not included in the calculation of the 2020 gross water use.

5.4 2020 Compliance Daily Per-Capita Water Use

The 2020 compliance daily per capita water use (in GPCD) was calculated in accordance with Methodology 4 of DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* document. The SB X7-7 Compliance Form is a set of tables containing calculations demonstrating that the City met the 2020 target and achieved a 20% reduction from its baseline and is provided in Appendix G. 2020 GPCD and target compliance are also summarized in DWR Table 5-2.

DWR Table 5-2

Submittal Table 5-2: 2020 Compliance from SB X7-7 2020 Compliance Form				
2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD		
203	0	203	247	Yes
NOTES: No allowable adjustments were applicable to the City.				

CWC Section 10608.24(d)(1) allows for adjustments to be made for factors outside of the supplier's control when determining compliance. Such factors include differences in evapotranspiration and rainfall, substantial changes to commercial or industrial water use due to increased business output and economic development, and substantial changes to institutional water use resulting from extraordinary events. No adjustments were made to the City's 2020 GPCD, as noted in DWR Table 5-2, and the City was able to demonstrate compliance without adjustments.

5.5 Regional Alliance

The City has complied with SB X7-7 and UWMP requirements as an individual supplier and has elected to not participate in a Regional Alliance.

Chapter 6 Water Supply Characterization

This chapter catalogues and describes the various water resources and supplies available to the City of Roseville including contract supplies from other agencies, surface water, groundwater, storm water, wastewater, and recycled water, as well as water transfers. The supply source, origin, quality, quantity, and impacts of climate change on availability for each source are discussed within this section.

6.1 Surface Water

The City's primary water supply contracts are and have historically been comprised of high-quality surface water received through Folsom Reservoir according to the terms of the City's water supply contracts with the US Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD). Since these supplies are not considered self-supplied and are instead purchased through other agencies, they are described in Section 6.2 Purchased and Imported Water.

6.2 Purchased and Imported Water

The City has historically relied heavily on its water supply contracts with Placer County Water Agency, the US Bureau of Reclamation, and San Juan Water District. All four untreated surface water contract entitlements for American River water total 66,000 acre-feet per year (AF/yr). The City's current contract and supplies of are outlined in COR Table 6-A.

COR Table 6-A Surface Water Supply Summary

Contract Supply	Supply Type	Quantity	Availability
USBR	Raw Surface Water	32,000 AF	Subject to CVP M&I Usage Policy(1)
PCWA	Raw Surface Water	30,000 AF	All Year Types
SJWD	Raw Surface Water	800 AF	Normal or Wet Hydrologic Years
SJWD	Raw Surface Water	3,200 AF	Normal or Wet Hydrologic Years
(1) The City's USBR Supply is subject in any year to determinations of allotments based on unimpaired inflow to Folsom Reservoir and downstream operations.			

Water supplies from all three source agencies outlined above are received through the same point location at Folsom Dam. Folsom Lake has been the primary source of water supply for the City of Roseville since 1971. Surface water from the American River is collected and diverted at the Folsom Lake Pumping Plant located at Folsom Dam. The City receives supplies from all four of its raw water contract entitlements through the Folsom Lake Municipal and Industrial (M&I) Intake at this facility.

Untreated water supplies received at this point are conveyed by gravity or pumped by USBR depending on lake level through two parallel pipelines (84-inch and 72-inch) to the City's Barton Road Water Treatment Plant (BRWTP), with a capacity for treatment of volumes up to 100 MGD. The 72-inch pipeline was constructed in 2010 to increase redundancy and reliability of this critical supply route, in partnership with SJWD. Additionally, the City has 19 intertie facilities with neighboring agencies through which water supplies may be transferred under normal

water year conditions as well as emergency or drought conditions. In the future, the City is exploring options with PCWA to facilitate receipt of treated water directly through existing and/or new intertie facilities.

6.2.1 Contract Supplies – Vulnerabilities and Restrictions

The City's contract supply with the USBR as part of the Central Valley Project is subject to yearly assignments based on each year's hydrologic conditions. Each year the City is informed in April of the determined percentage allotment of the full 32,000 AF allowed by the contract terms. This determination is made based on the unimpaired inflow of runoff into Folsom Reservoir. This supply is therefore highly vulnerable to climate change and its impacts on rainfall and snowpack conditions upstream of Folsom Reservoir in the Sierra Nevada Mountains. In recent years, this allotment has varied significantly on an annual basis and the City has undertaken dedicated efforts to examine alternatives for increasing water supply reliability in all year types.

The City's contract supply with PCWA is available in all hydrologic year types; it is also conveyed from the Middle Fork Project (MFP) through Folsom Reservoir and received as raw water at the same diversion point at Folsom Dam. The City is currently exploring potential future purchase of additional treated water supply received directly from PCWA to complement the raw water contract supply. PCWA's future Ophir Water Treatment Plant may provide up to 3,360 AF to the City in the future. The City is also currently engaged with PCWA to explore improvements to existing intertie facilities to expand and diversify opportunities for the transfer of supplies not dependent on the diversion facility at Folsom Dam.

The City has two water supply contracts with SJWD totaling 4,000 acre-feet. This supply is only available in Normal or Wet Year types and is received either through Folsom Reservoir or through interties with SJWD.

The City's surface water supplies are all dependent upon the operation of Folsom Reservoir by the US Bureau of Reclamation; the dam that creates the reservoir was originally constructed with a primary purpose of flood control, not water supply, and is still operated according to that primary function. The importance of this facility has led the City to examine options for redundancy, resilience, and or improvements with respect to the intake, and best practices in terms of management of its other water resources.

6.2.2 Water Forum Agreement

The City is a member of the Sacramento River Forum and a signatory to the Water Forum Agreement (WFA). Accordingly, the City has agreed to limit its diversions from the upper American River to 58,900 AF/yr during Normal and Wet water years, and to between 58,900 AF/yr and 43,800 AF/yr in Drier and Driest water years. The City is responsibly committed to the Water Forum Agreement but maintains the position that "By instituting programs to conserve water, it abandons no right, title or interest in or to any City water rights, contractual entitlements or any appurtenant rights necessary to exercise such water rights or entitlements," as described by Resolution No. 09-64, Declaring an Intent to Retain Control of Conserved Water (Appendix H).

6.2.3 Other Available Water Purchases

The City may choose to purchase Article 3F water from the Bureau of Reclamation when such supply is available. This supply source is typically only available in winter and spring months as it is generally considered "excess flow" released by the USBR above and beyond the entitlements of downstream users. In 2019 the City exercised this option and used approximately 950 AF of Article 3F water as part of their ASR program to inject and recharge the

aquifer. This effort represented a continued commitment to provide not only water supply reliability for the City's residents but also to support Conjunctive Use to aid in regional water supply reliability.

6.3 Groundwater

In recent years, the City has taken significant steps to expand and strengthen their Groundwater Program to broaden the City's water supply portfolio. The City currently owns and maintains 6 operational groundwater wells, with 6 additional wells planned for development in the next 10 years, and one planned destruction. Four of the 6 operational wells are capable of Aquifer Storage and Recovery (ASR) whereby treated water is injected into the underlying aquifer for later extraction and use. Currently, the City plans to design all new wells with ASR capability, as the City moves toward a more evenly distributed reliance on diverse water resources and regional sustainability.

Groundwater is considered to be available for use as part of Roseville's water supply portfolio in all year types including Normal, Single-Dry, or Five Consecutive Year Drought scenarios. Importantly, groundwater will be a critical resource in future drought years as it supplements increasingly vulnerable surface water supplies.

6.3.1 Groundwater Basin Description

The City is located over the North American Subbasin of the Sacramento Valley Groundwater Basin. The North American Subbasin (DWR Groundwater Basin Number 5-21.64) is located in the eastern central portion of the Sacramento Groundwater Basin, encompassing portions of Sutter, Placer, and Sacramento Counties. As of 2020, the Basin is listed by DWR as high priority in large part due to the population in the basin and existing and projected future groundwater use, but the basin has neither been adjudicated nor is it considered in overdraft or critical overdraft conditions.

Groundwater elevations in the subbasin along the Placer/Sacramento County line declined at a rate of 1 to 1.5 feet per year for multiple decades until approximately the mid-1990s. Some of the largest decreases have occurred in the area of the former McClellan Air Force Base. From 1995, groundwater elevations were stabilized, and the declining elevation trend was dampened due to groundwater management activities stemming from the Water Forum Agreement restraining further increases in groundwater pumping and implementation of in-lieu banking in the region. Groundwater elevations in Sutter and northern Placer counties generally remain stable, although some wells in southern Sutter County have experienced declines.

In addition, the subbasin has historically been pumped by agricultural and urban users. Recently, in some areas of the subbasin, agricultural land has been and is being developed and converted to urban uses. At this time, the subbasin is operating within the current estimate of sustainable yield.

6.3.2 Groundwater Management

The City actively manages groundwater resources both internally in coordination with land use planning and growth projections as well as regionally in accordance with the provisions of the Sustainable Groundwater Management Act. These efforts are discussed in the following subsections.

6.3.2.1 Western Placer County Groundwater Management Plan

A Groundwater Management Plan (GMP) was completed in November of 2007 in accordance with Senate Bill (SB) 1938 and Assembly Bill (AB) 3030 in cooperation with PCWA, City of Lincoln, and California American Water. The GMP is available through the PCWA website: Western Placer Groundwater Management Plan.

6.3.2.2 Sustainable Groundwater Management Act (SGMA)

The Sustainable Groundwater Management Act of 2014, or SGMA, was a three-bill legislative package composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley). The package was passed in September 2014 and contains a framework for sustainable management of groundwater supplies by local agencies, with a limited role for state intervention if local agencies fail to meet the requirements of SGMA. SGMA lays out a process and a timeline for local authorities to achieve sustainable management of high and medium priority groundwater basins throughout the state. It also provides tools, authorities, and deadlines to achieve statewide sustainable groundwater management. For local agencies involved in implementation, the requirements are significant and will take years to accomplish. DWR has the responsibility to evaluate local agency progress, while the SWRCB may intervene if DWR determines that local agencies fail to make progress and achieve the requirements of SGMA. Essentially, local agencies who volunteer to comply with SGMA must form as Groundwater Sustainability Agencies (GSAs) and prepare, adopt, and implement a Groundwater Strategic Plan (GSP) that meets the requirements of SGMA.

More specifically, critical required steps include the formation of GSAs within two years of when SGMA became effective; the adoption of GSPs within 5-7 years depending on the status of the basin in question (in critical overdraft condition or not); and preparation, adoption and implementation of a GSP(s) that achieves the sustainability goal within 20 years of plan adoption.

SGMA applies to basins or subbasins designated by DWR as high or medium-priority, based on a statewide prioritization that uses criteria including population, importance and amount of groundwater pumped, extent of irrigated agriculture dependent on groundwater, and other criteria. DWR's final Basin Prioritization findings indicate that there are 127 of California's 515 groundwater basins and subbasins which are high and/or medium-priority. These high and medium-priority basins account for 96% of California's annual groundwater pumping and include 88% of the state's population. The priority ranking for the North American sub-basin of the Sacramento Valley groundwater basin is 24 out of the state's 515 basins, with an overall ranking score of 22.5 and a designation of High Priority.

The City is well along the path of SGMA compliance, having joined the West Placer Groundwater Sustainability Agency (WPGSA) consisting of the City of Lincoln, Placer County Water Agency, Nevada Irrigation District, and the County of Placer. The WPGSA is one of a group of five GSAs formed within the North American Subbasin that consist of West Placer Groundwater Sustainability Authority, Sacramento Groundwater Authority, South Sutter Water District, Sutter County, and Recreation District 1001 GSAs. All five of these GSAs will prepare and submit one joint GSP for the entire Subbasin. This GSP will be submitted to DWR in advance of the January 31, 2022 deadline for high-priority basins not currently in critical overdraft.

6.3.3 Historical Groundwater Production

Until recently, groundwater had not been utilized by the City under normal year conditions. In the 2015 UWMP, the City's groundwater wells were identified for use only in drought or emergency conditions, with minimal pumping for the purpose of maintenance or demonstration of the City's ASR program. Over the last five years, the City has worked to advance and expand the groundwater infrastructure and groundwater program to provide additional water supply reliability.

Beginning in 2018, the City began to regularly operate existing groundwater infrastructure specifically by pumping small volumes of groundwater from the City's production wells and serving that water into the distribution system as part of the maintenance plan. In 2019 and 2020, the City was able to store excess surface water through the use of ASR production wells by injecting that water into the aquifer. As the City continues to develop this program and look to the future of sustainable supply, groundwater pumping patterns will continue to evolve. A summary of the amount of groundwater pumped by the City over the past five years is provided in DWR Table 6-1.

DWR Table 6-1

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	North American Sub-basin of the Sacramento Valley Groundwater Basin 5-21.64	0	0	16.6	23.37	201.1
	TOTAL	0	0	17	23	201
NOTES: Water pumped from Roseville groundwater wells does not need to be desalinated.						

6.3.4 Aquifer Storage and Recovery

The City considers development of a diverse and drought resistant water supply portfolio of primary importance. To this end, the City has invested in both planning and capital improvements develop their Aquifer Storage and Recovery (ASR) Program into a highly functional and critical component of the Water Utility's future. The ASR Program utilizes groundwater pumping infrastructure along with existing water supplies to increase reliability. ASR wells are capable of injecting treated surface water from the distribution system into the groundwater aquifer for later extraction and use. A schematic of wells equipped for ASR within an urban environment, accessing the underlying aquifer for groundwater, is provided in Figure 6-1.

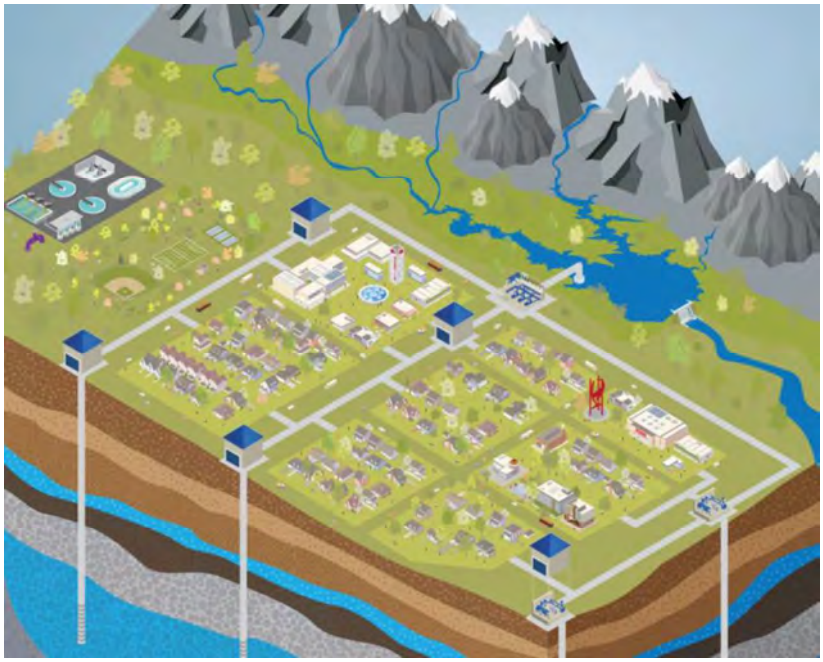


Figure 6-1 Urban Groundwater Infrastructure Schematic

ASR production wells can be used seasonally (i.e. throughout the water year) or periodically over many years to create a "groundwater bank", storing surface water supplies within the aquifer in times of abundance (wet season or years) for use in times of scarcity (dry season or years). An important component of an ASR Program is to maintain consistent and detailed records of groundwater levels within the aquifer and extraction/injection volumes. This information is used to ensure the groundwater basin is managed sustainably providing water supply reliability benefits while avoiding impacts to the groundwater basin. The City is a committed leader in the region with respect to the development of potential future cooperative water banking and responsible regional resource management.

6.4 Stormwater

At this time, the City does not employ any active stormwater recovery measures. In recent years, the City has invested in studies to determine whether stormwater recapture represents a possible resource for future diversity in groundwater recharge projects. Considerations include water rights, timing and quantity of available runoff, property rights, and water quality, among others. Given the complexity of the issues pertaining to stormwater capture or surface spreading, the City continues to conduct analyses to determine the feasibility of this option in the future.

6.5 Wastewater and Recycled Water

The City currently owns and operates two regional wastewater treatment facilities that treat wastewater flows collected from the City, South Placer Municipal Utilities District (SPMUD), and some areas of unincorporated Placer County. This section provides information on wastewater management, as well as its current and potential reuse as a recycled water resource.

6.5.1 Wastewater Collection, Treatment, and Disposal

The South Placer Wastewater Authority (SPWA) was created under a Joint Powers Agreement in October 2000 and is comprised of the City of Roseville, South Placer Municipal Utilities District, and the County of Placer. The SPWA oversees policy for funding regional wastewater infrastructure. The City collaborates with the regional partners on forward planning and best practices for the management of these regional facilities.

The wastewater collection and treatment facilities within the City's service area are maintained and operated by City staff. The wastewater collection facilities outside of the City's service area are maintained by the other SPWA agencies (Placer County and SPMUD). Wastewater outside of the City's service area but within the SPWA Service Area Boundary is conveyed through trunk sewers to the City's wastewater treatment facilities located within the City limits. Metering stations are located at the City's service area boundaries to account for the wastewater entering the City's collection system originating from Placer County and SPMUD collection areas.

The City owns and operates on behalf of the SPWA the Dry Creek Wastewater Treatment Plant (Dry Creek WWTP) and the Pleasant Grove Wastewater Treatment Plant (Pleasant Grove WWTP). Both plants discharge tertiary treated wastewater to surface water. Dry Creek WWTP discharges to Dry Creek while the Pleasant Grove WWTP discharges to Pleasant Grove Creek. The two wastewater treatment plants serve an area that extends beyond the City boundaries.

The Dry Creek WWTP provides tertiary-level wastewater treatment. The treatment consists of screening, grit removal, primary clarification, aeration, nitrification and denitrification, secondary clarification, filtration, and ultraviolet disinfection. Disinfected tertiary-treated wastewater from the Dry Creek WWTP meets Title 22 regulations for full, unrestricted use. The current (2020) average dry weather flow (ADWF) is approximately 8.5 MGD, of which approximately 65%, or 5.5 MGD comes from the City of Roseville.

The plant is currently authorized to discharge up to 18 MGD ADWF into Dry Creek under the Municipal General Order. The Dry Creek WWTP discharge is assigned Municipal General Order enrollee number R5-2017-0085-004 and National Pollutant Discharge Elimination System (NPDES) permit No. CAG585001. Per the State Water Resources Control Board Division of Water Rights, the City is required to maintain an instream flow of four million gallons per day discharge to Dry Creek. Disinfected tertiary treated wastewater from the Dry Creek WWTP meets Title 22 regulations for full, unrestricted use. The Dry Creek WWTP currently (2020) produces 1,063 AF/yr of recycled water. A portion of recycled water from Dry Creek is discharged into a gravity line that supplies a school and Morgan Creek Golf Course, both of which are located in Placer County, outside the City's water service area. The remainder of recycled water from the Dry Creek WWTP is pumped into the recycled water distribution system and used within the City's water service area.

The Pleasant Grove WWTP currently (2020) treats approximately 8.1 MG ADWF with approximately 65% or 5.3 MGD coming from the City of Roseville. The Pleasant Grove WWTP provides disinfected tertiary-level treatment through the process of screening, grit removal, secondary aeration, secondary clarification, filtration, and ultraviolet disinfection. The Pleasant Grove WWTP discharge is assigned Municipal General Order enrollee number R5-2017-0085-005 and National Pollutant Discharge Elimination System Permit No. CAG585001. There are no instream flow requirements for Pleasant Grove Creek.

Disinfected tertiary-treated wastewater from Pleasant Grove WWTP meets Title 22 regulations for full, unrestricted use. The Pleasant Grove WWTP currently (2020) produces 2,434 AF/yr of recycled water that is pumped into the recycled water distribution system and used within the City's service area boundary.

Pleasant Grove WWTP is currently undergoing construction of a major capital improvement project which began in November 2019 and is expected to be complete in 2022. The project includes an increase in treatment capacity from 9.5 MGD up to 12 MGD. Improvements to the treatment process include the addition of primary clarification, waste activated sludge thickening, and anaerobic digestion. This project represents significant improvement to the capacity of the Pleasant Grove WWTP with important components of long-term resilience and improved efficiency of the City's utilities.

The project also includes important improvements which benefit the environmental and create renewable energy resources. Methane from anaerobic digestion will be converted to a renewable compressed natural gas (CNG) to fuel the City's growing solid waste fleet and fuel new microturbines that generate electricity for plant usage. The project includes a receiving facility for energy-dense wastes to enhance methane production.

As previously described, both treatment plants are regional wastewater facilities and as such, wastewater is generated both inside and outside of the City from a combination of residential and non-residential sources. A summary of the volume of wastewater processed at and discharged from each of the City's wastewater treatment plant in 2020 is provided in DWR Table 6-2 and DWR Table 6-3.

DWR Table 6-2

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
100%	Percentage of 2020 service area covered by wastewater collection system					
100%	Percentage of 2020 service area population covered by wastewater collection system					
Wastewater Collection			**Recipient of Collected Wastewater**			
Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
City of Roseville	Metered	5,958	City of Roseville	Pleasant Grove WWTP	Yes	No
City of Roseville	Metered	6,501	City of Roseville	Dry Creek WWTP	Yes	No
Total Wastewater Collected from Service Area in 2020:		12,459				
NOTES: All volumes are in AF. Approximately 65% of the flow received at the Dry Creek WWTP and 65% of the flow received at the Pleasant Grove WWTP originates in the City's water service area.						

DWR Table 6-3

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal	Wastewater Generated Outside the Service Area Treated?	Treatment Level	2020 volumes				
						Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Pleasant Grove WWTP	Pleasant Grove Creek	Creek	River or creek outfall	Yes	Tertiary	9,166	6,491	2,434	0	0
Dry Creek WWTP	Dry Creek	Creek	River or creek outfall	Yes	Tertiary	10,001	7,902	956	378	4,481
					Total	19,167	14,393	3,119	378	4,481

NOTES: All volumes are in AF.
100% of influent flow received at both WWTPs is treated and discharged within the City's service area boundary.

6.6 Recycled Water System

6.6.1 Recycled Water Coordination

The City regards recycled water as a valuable resource that is a key component of the City's overall water supply portfolio. The City operates its recycled water system and program in coordination with its regional wastewater partners, including South Placer Municipal Utilities District and Placer County. The City has been successfully irrigating landscaped areas throughout the City \and planning recycled water implementation as part of new development surrounding the City. The City prepared the 2016 Recycled Water Systems Evaluation to position the City for implementing the next phases of recycled water projects as new users within the City come online, and as the various UGA's plan for and install recycled water infrastructure.

The City operates the recycled water program though the requirements of Master Reclamation Permit Order 97-147 (Permit). The Permit implements the reclamation criteria of the City's Title 22 disinfected tertiary recycled water. Current uses of recycled water within the City include irrigation of landscapes and golf courses, industrial cooling for the Roseville Energy Park, and construction purposes such as dust control and soil compaction. Recycled water is also conveyed outside the City's water service area for golf course and landscape irrigation.

The City has prepared the South Placer Regional Wastewater 2020 Systems Evaluation Report (Appendix I), which delineates the current and projected service area boundary, including Urban Growth Areas expected to be added in the near future as development continues. The report provides baseline and projected characterizations of its regional wastewater and recycled water systems. The Systems Evaluation Report was updated to address recent annexations by the SPWA partner agencies, planning revisions, as well as changes in wastewater characteristics and flows. Recycled water supplies and availability are directly linked to the planning and operation of the wastewater treatment plants and must be managed and planned in coordination. The City and its SPWA partners continue utilizing recycled water supplies is to promote responsible water supply management. Beneficial use of available disinfected tertiary treated Title 22 recycled water allows surface water and groundwater supplies to be applied to potable uses.

All agency elements for a reuse program within the City boundary, including land planning, development, wastewater treatment, and water supply, are a part of the City of Roseville government organization.

6.7 Recycled Water Beneficial Uses

The City's recycled water program predominantly serves landscape irrigation customers. The City currently delivers recycled water to golf courses, parks, schools, and many miles of streetscape for landscape irrigation within the City's potable water service area. The City also provides recycled water to a school and a golf course outside of the City's potable water service area. The City delivers recycled water to the Roseville Energy Park, which is owned and operated by the City of Roseville Electric Utility, for industrial cooling purposes. Landscapes at both regional wastewater treatment plants also use recycled water for irrigation purposes. Recycled water can be used for construction purposes such as dust control and soil compaction.

The current and projected direct beneficial uses of recycled water in the City's water service area are shown in DWR Table 6-4.

DWR Table 6-4

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area										
Name of Supplier Producing (Treating) the Recycled Water:		City of Roseville								
Name of Supplier Operating the Recycled Water Distribution System:		City of Roseville								
Beneficial Use Type	Potential Beneficial Uses of Recycled Water	Amount of Potential Uses of Recycled Water	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Landscape irrigation (excludes golf courses)	Landscape irrigation of public areas and medians.	3,164	Landscape irrigation of public areas and medians.	Disinfected Tertiary	1,336	1,446	1,625	1,841	1,841	1,841
Golf course irrigation	Irrigation	2,577	Excludes golf course usage outside service area boundary.	Disinfected Tertiary	1,744	1,888	2,121	2,403	2,403	2,403
Industrial use	Industrial cooling	310	Roseville Energy Park (REP) cooling water use.	Disinfected Tertiary	310	310	310	310	310	310
Other	Morgan Creek Golf Course	348	Irrigation	Disinfected Tertiary	378	378	378	378	378	378
				Total:	3,768	4,022	4,435	4,933	4,933	4,933
				2020 Internal Reuse	yes					
NOTES: All values are reported in AF.										

The uses listed in DWR Table 6-4 include use of recycled water supply as well as required discharges. Recycled water uses represent demands within the City's service area boundary including all approved specific plans. The 4 million gallon per day required discharge to Dry Creek as an instream flow requirement totaling 4,480 AF/yr is not shown in DWR Table 6-4.

A comparison of the 2020 actual use of recycled water to what was projected for use in 2020 in the 2015 UWMP is provided in DWR Table 6-5.

DWR Table 6-5

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
Use Type	**2015 Projection for 2020**	**2020 Actual Use**
Landscape irrigation (excludes golf courses)	1,923	1,336
Golf course irrigation	1,378	1,744
Industrial use	1,120	310
Total	4,421	3,390
NOTES: All values are in AF. Golf course irrigation does not include golf course irrigation outside the City's service area (Morgan Creek Golf Course)		

6.8 Actions to Encourage and Optimize Future Recycled Water Use

As of 2020, the peak recycled water production in July is approximately equal to the peak recycled water demand in July. For the City to further expand recycled water usage during the irrigation season, additional recycled water must be made available. This will most likely be accomplished through expansion of operational storage, with the necessary storage volume dependent on actual demand requirements. Therefore, the City will continue to evaluate in-City and regional recycled water demands and consider its ability to provide recycled water for future projects.

It is the policy of the City that where the use of recycled water is feasible, appropriate, and acceptable to all applicable regulatory agencies, the City will require an owner or customer to use recycled water for approved uses. The City has other methods of encouraging recycled water use including a rate discount and public education. The recycled water rate for customers is currently 50 percent of the potable water rate. The City also implements an extensive public education campaign to educate its customers about the reliability and other benefits of recycled water. Another major benefit to customers of using recycled water is that it can be used reliably in times of drought. In the event the City imposes drought restrictions on uses, such as irrigation and construction, recycled water is exempt from these restrictions. Under certain drought stages, the City would mandate the use of recycled water for construction purposes.

One target of future recycled water use is new development, as stated in DWR Table 6-6. A major hindrance to expanding use of recycled water in existing developments is lack of infrastructure. Installing new infrastructure in existing areas is exceedingly expensive. The City requires use of recycled water for all commercial irrigation services in newly developing master planned areas. This is feasible because the recycled water infrastructure can

be installed as part of the original project. Additionally, the City is considering expanding recycled water distribution to entities both within and outside the potable water service area.

DWR Table 6-6

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
Page 6-12	Page location of recycled water use narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Developer Agreements	Per City of Roseville development standards, recycled water must be incorporated into future construction.	2020-2045	1,165
		Total	1,165
NOTES: All values are in AF.			

6.9 Desalinated Water Opportunities

There are no opportunities for the development of desalinated water within the City's service area as a future supply source. The City is not located near any bodies of water that would allow for the option.

6.10 Exchanges or Transfers

The City maintains an on-demand treated water system that is used for municipal and industrial purposes. The City maintains direct treated water interties with five surrounding jurisdictions, as described in Section 2.2.3. The City can transfer water between jurisdictions through these interties or access water to supplement its distribution system. These facilities are designed to be used for wheeling water through the service area or for demand shortage assistance.

As a condition of the Water Forum Agreement, the City has entered into a re-operation agreement with PCWA for up to 20,000 AF to be used when Roseville's surface diversion is cut back. In general, the agreement calls for PCWA to release up to an additional 20,000 AF to the American River on an annual basis during time of reduced water availability in the system. This water is to maintain flows in the Lower American River (Nimbus Dam to Sacramento River), and therefore is not available for the City's use. This re-operation water is considered a transfer, although the ultimate user of the water, if any, has not been identified as part of the agreement - only that the water would be marketed when it was identified as available. It is possible there could be multiple users as the water will flow to the Delta and theoretically be available to all Delta water users.

Also, as a condition of the Water Forum Agreement, the City has committed to not take the entire amount of contracted water from the Upper American River. As a result of having 66,000 AF/yr of water available through various contracts and a commitment to take no more than 58,900 AF/yr from the American River Watershed, there is an opportunity to find a long-term transfer for the 7,100 AF/yr with a user downstream of the confluence of the American and Sacramento Rivers. The Water Code definition of short- and long-term conditions are that short-term is considered for a period of one year or less and long-term is for a period of more than one year.

6.11 Supply Management

The City has historically relied primarily on their suite of surface water contracts, supplying high quality water through the City-owned Barton Road Water Treatment Plant, and serving the City's population through gravity flow. In most year types, the City will continue to rely primarily on these supply sources for the bulk of potable water supply. Of these surface water contracts, the City employs supplies through the USBR contract as a first priority each year, pulling next from the PCWA contract as needed. Each year allocations from the USBR are subject to variation, resulting in potential differences in the duration and quantity of supply pulled from this contract annually.

City Water Utility staff plan to utilize groundwater infrastructure differently in Normal and Dry hydrologic years. In general, Roseville plans to use groundwater infrastructure in accordance with sustainable groundwater management goals and objectives. In a Normal year, this means that the City plans to extract up to the quantity of water banked in that year. In drought years, the City may find the need to operate its wells more significantly to meet demands when significant impacts are seen to surface water supplies. This is outlined further in Chapter 7. As the City continues to install more ASR wells into the coming decade, provisions of the municipal code will be updated to reflect their groundwater strategy.

6.12 Future Water Projects

The City has taken a proactive approach to ensuring resource diversity with a focus on surface water contracts, strong groundwater infrastructure, and highly collaborative regional presence in water planning and future conjunctive use. Future water supply project opportunities, including diversifying the purchasing or importing of water, expansion of the City's groundwater and ASR program, and regional cooperative conjunctive use are discussed in the following sections.

6.12.1 Purchased or Imported Water

In addition to the current contract with PCWA for 30,000 AF/yr of surface water, the City is evaluating and may enter an agreement with PCWA for additional treated surface water supplies available in all hydrologic year types. The treated PCWA water would be supplied by PCWA's future Ophir Water Treatment Plant (Ophir WTP) which will treat water from the Middle Fork Project. The Ophir WTP will be constructed in phases, with the first phase expected to be operational by 2035 and provide an estimated 10 MGD total supply to all customers. Additional phases will be evaluated as PCWA wholesale customers need new supply. The City may purchase up to 3 MGD of normal year capacity from the Ophir WTP, equivalent to 3,360 AF/yr of treated surface water supply.

The City is also exploring future opportunities for water transfers with regional partner agencies in an effort to diversify regional water management strategies in conjunction with responsible groundwater management practices. In 2019, the City executed an agreement for pilot water transfer program with Sacramento Municipal Utilities District (SMUD). This agreement allowed for an annual water transfer for up to 6,000 AF for three years. The transfer allows Roseville to use wet season higher flows to recharge the groundwater aquifer for later season extraction and use. The transfer was executed consistent with Water Forum Agreement policies and goals, as well as an excellent precedent for regional conjunctive use strategies. The City may look to renew this transfer or evaluate similar opportunities in coming years to provide drought resiliency and support the sustainable management of groundwater.

6.12.2 Groundwater and ASR Program

The City has historically relied upon groundwater resources only as a backup supply in times of shortage. Over the last few years and in response to lessons learned during the 2015 drought, changing climate conditions, and the overall need for further diversity and reliability of water supply, the City has invested in efforts to operationalize and expand its groundwater program as a regular part of its water supply portfolio in all year types. Along this vein, the City developed a Groundwater Strategic Plan in an effort to evaluate current infrastructure, potential new well sites, further understand the condition and accessibility of the aquifer within the City's service area boundary, and how groundwater planning would look moving forward. The result of these planning efforts has been the identification of 6 future well sites throughout the City's Pressure Zones 1 and 4, with a heavier emphasis on infrastructure on in Pressure Zone 1. Conceptual design and siting have been completed for these future well sites, with exploratory drilling. The City plans to install these wells and their topside improvements within the next 5-10 years, all with ASR capability to enhance flexibility of operations and expand the City's conjunctive use capabilities. For planning purposes, each well is assumed to extract a nominal 1,750 GPM, with a final production value to be determined upon production well drilling and development. These 6 future wells are expected to represent a total of 16,936 AF/yr of additional water supplies.

Four of the City's six existing wells have ASR injection capability, and at this time the City plans for future wells to also be ASR capable. The ASR Program will not only allow the City to change the pattern of water withdrawal from Folsom Reservoir from peak demand times in the summer to times when water is more available (i.e. the winter) but could also be used as a replacement for surface water in WFA dry/drier years. The expected future water supply programs are listed in DWR Table 6-7.

DWR Table 6-7

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
Name of Future Projects or Programs	Joint Project with other suppliers?		Description	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Yes/ No	Agency Name (if applicable)				
Regional Conjunctive Use	Yes	Various	Regional water banking and aquifer storage and recovery projects.	2025	All Year Types	Not Yet Determined
Production/ASR Well Program Expansion	No		Development of up to 6 new production wells with ASR capability.	2035	Potentially, All Year Types	14,431
Ophir Water Treatment Plant	Yes	PCWA	Partnership with PCWA in the development of additional treated water capacity for purchase through existing interties.	2035	All Year Types	3,360
PCWA-Roseville Cooperative Water Reliability Project	Yes	PCWA	Partnership with PCWA to optimize and improve existing interties to increase supply transfer volumes and reliability.	2025	All Year Types	Not Yet Determined
NOTES: All values are in AF.						

6.13 Summary of Existing and Planned Sources of Water

The City's current planned sources of water can be summarized as such:

- The City is currently contracted to purchase 66,000 total AF/yr of American River water diverted from Folsom Lake with certain restrictions (see Chapter 7).
- The City intends to purchase an additional treated water supply from PCWA of 3,360 AF/yr as part of their Ophir Water Treatment Plant project.
- The City neither currently uses nor plans to use surface water that is not mentioned above.
- The City maintains groundwater wells for normal, drought year, and emergency supply. Four of the City's 6 existing active production wells possess ASR capability.
- The City does not currently use storm water as a potable water offset. The City is investigating future opportunities to use stormwater in other beneficial ways.
- The City currently utilizes and has future plans to expand recycled water usage.
- The City neither currently uses nor plans to use desalinated water.
- The City maintains direct treated water interties with four surrounding jurisdictions for use in emergency or water transfer situations.

The actual 2020 water supplies for the City are summarized in DWR Table 6-8 and the future projected water supplies for the City are summarized in DWR Table 6-9.

DWR Table 6-8

Submittal Table 6-8 Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2020	
		Actual Volume	Water Quality
Purchased or Imported Water	US Bureau of Reclamation	24,375	Drinking Water
Purchased or Imported Water	Placer County Water Agency	9,409	Drinking Water
Purchased or Imported Water	San Juan Water District	0	Drinking Water
Groundwater (not desalinated)	City of Roseville owned production wells	201	Drinking Water
Recycled Water	Recycled water produced by City of Roseville WWTPs	3,497	Recycled Water
	Total	37,482	
NOTES: All values are in AF.			

DWR Table 6-9

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
Water Supply		Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Purchased or Imported Water	USBR - CVP Contract Supply	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000
Purchased or Imported Water	PCWA - Middle Fork Project Supply	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Purchased or Imported Water	SJWD	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Other	Water Forum Limitation on American River Supply Diversion	-7,100		-7,100		-7,100		-7,100		-7,100	
Purchased or Imported Water	PCWA - Potential Future Purchase (OPHIR WTP)	0	0	0	0	3,360	3,360	3,360	3,360	3,360	3,360
Groundwater (not desalinated)	Groundwater Wells	1,560	7,920	2,720	12,570	3,350	14,430	3,350	14,430	3,350	14,430
Recycled Water	South Placer Wastewater Authority	4,791	4,791	5,269	5,269	5,643	5,643	5,958	5,958	6,383	6,383
	Total	65,311	77,991	66,869	82,309	69,283	86,103	69,598	86,418	70,023	86,843

NOTES: Under normal year operations, the City intends to manage groundwater use sustainably through the active recharge of surface water through the ASR Program. Values shown above assume a 3-month injection window and an equal volume of extraction. New ASR well infrastructure is expected to be operational by 2030, with additional wells installed by 2035.
All values are in AFY.

6.14 Climate Change Impacts to Supply

6.14.1 Local Climate Change Outlook

The City has acknowledged and incorporated many recent lessons learned from the last 10 years of climate related impacts to the reliability of its water supply. Beginning with the extended drought early in the decade, culminating with the extreme shortages experienced in 2015, Roseville has seen unprecedented curtailments of water supply and how important diversity of sources, diversion locations, and other options become when regular supply is interrupted.

It is expected that regional reductions in Sierra Nevada snowpack will continue and worsen in the coming years, creating uncertainty of surface water supplies – specifically the contract Roseville holds with USBR for 32,000 AF annually which can be curtailed down to 0% depending on each year's hydrologic outcome. Further, in drought years a lack of inflow to Folsom Reservoir can reduce water surface elevations significantly and quickly, with the possibility of exposing the intake facility at the dam.

The City's surface water supplies will be more vulnerable to declining snowpack in coming years, with potential for severe limitations in single dry years as well as periods of persistent drought. Integrating cross-seasonal groundwater management (injecting in times of excess for extraction in times of scarcity) will provide much needed resilience in the face of shifting climate conditions.

With these things in mind, the City has taken steps to operationalize its groundwater infrastructure and work toward beneficial use (injection) of excess wet season supplies in preparation for seasonal shortages in surface supply. It is important to note that Roseville is not simply planning to draw from the aquifer to offset its surface water contracts, but rather that they are making concurrent plans to recharge this aquifer and bank supply before the need arises. It is this type of forward planning that Roseville brings to the regional stage in helping the group of agencies relying on these same supply sources to move toward a more sustainable outlook. Diversity of operations and supply sources allow a more flexible approach to each year's specific hydrologic conditions and water demand.

6.14.2 Regional Climate Studies

In 2020, the American River Basin (Basin) region conducted a climate change study in partnership with local water purveyors and the USBR. The purpose of the American River Basin Study (ARBS or Study) was to develop data, tools, analyses, identify supply-demand imbalances, and climate change adaptation strategies specific to the Basin. Under the "new normal" of a changing climate, the ARBS aims to improve the resolution of regional climate change data and to develop regionally specific mitigation and adaptation strategies. As a participant of the study, and service area contained within the Study Area, the following summarizes climate change findings pertinent for the region. More detail, along with the approved study can be found at www.pcwa.net/planning/arbs.

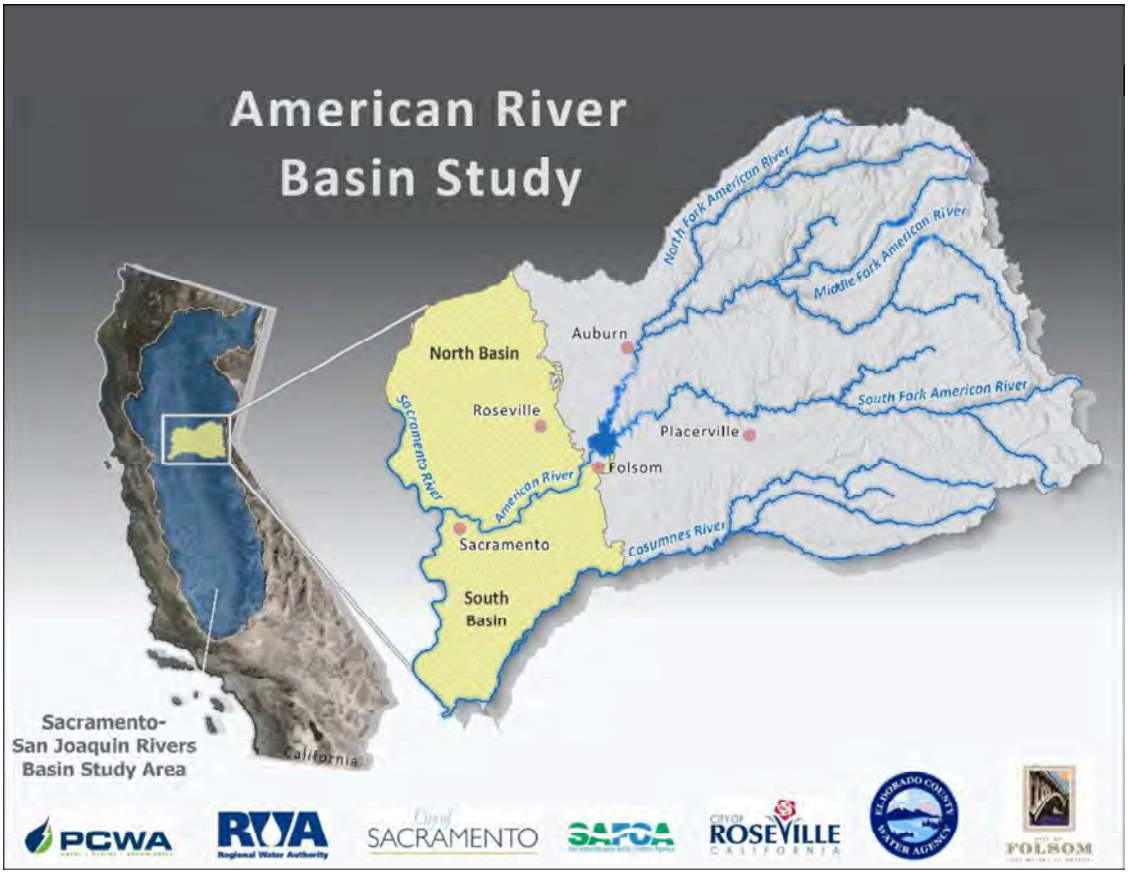


Figure 6-2 American River Basin Study Area

The Study Area is bounded by the Sierra Nevada mountain range to the east, the Feather and Sacramento rivers to the west, the Bear River to the north, and the Cosumnes River to the south (see Figure 6-2). In addition to the American River Watershed, the Study Area encompasses the North and South American Groundwater Subbasins, and Non-Federal Partners' service areas outside of the American River Watershed.

6.14.3 Projected Future Conditions

Analysis of projected future climate conditions in the American River Basin and development of climate scenarios for the ARBS were based on an ensemble of bias-corrected and spatially downscaled climate projections[1]. This ensemble has been used by the California Water Commission and DWR as the primary source of climate projection information in several recent studies, including the Water Storage Investment Program (WSIP) and California's Fourth Climate Change Assessment (Pierce et.al., 2018). Projected future climate conditions were evaluated and characterized based on the ensemble of downscaled climate projections.

[1] Climate projections were developed using Global Climate Models from the Coupled Model Intercomparison Project Phase 5 (CMIP5) and downscaled using Localized Constructed Analogs (LOCA) method projected and coupled with two future emission scenarios (RCP 4.5 and RCP 8.5) available from Dr. David Pierce at the Scripps Institution of Oceanography.

Hydrology scenarios were used to develop streamflow inputs to CalSim 3.0, which was then used to evaluate changes in water supplies, demands, and management throughout the CVP and State Water Project (SWP), including the Study Area. Demands for each water purveyor largely relied upon water purveyor's information provided in Regional Drought Contingency Plan/Regional Water Reliability Plan (RWRP) (Regional Water Authority, 2017) and 2015 UWMPs.

6.14.3.1 Temperature

Surface air temperatures are projected to increase steadily, with average summer temperatures increasing by approximately 7.2 degrees Fahrenheit (°F) by the end of the 21st century (see Figure 6-3), and winter temperatures increasing by 4.9°F. Projections of daily maximum and minimum temperatures suggest similar warming trends during all seasons, with maximum temperatures projected to increase as much as 7.3°F during the summer months.

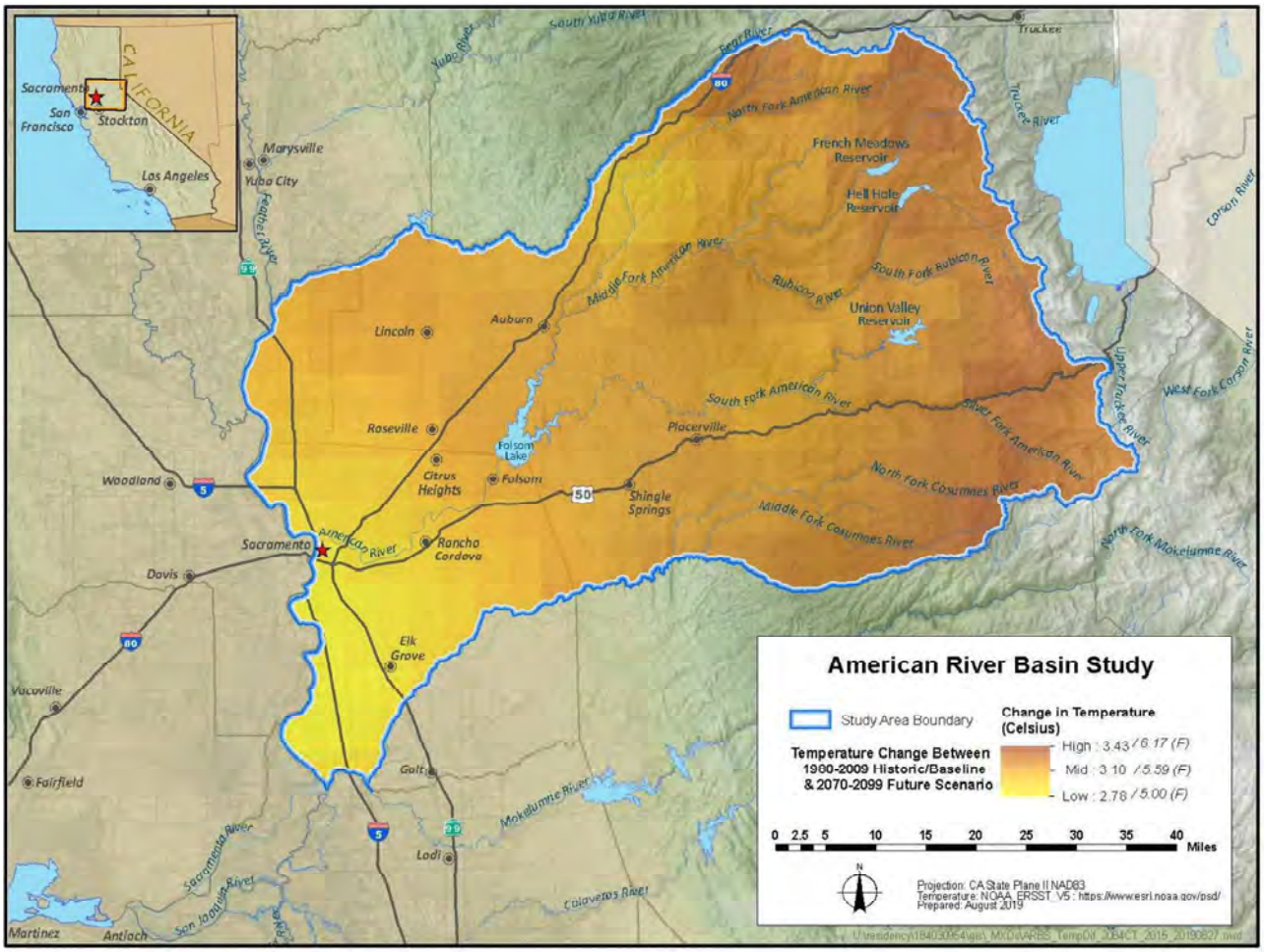


Figure 6-3 Projected Changes in July Temperature between Historical (1980-2009) and End of Century Under Central Tendency Climate Change

6.14.3.2 Precipitation

Annual precipitation projections show no significant trend in the median of change over the 21st century. Many of the available GCM projections show change in precipitation, but there is no consistency in the magnitude and

direction of projected change between models. Approximately half of the projections indicate a minor increase in annual precipitation and half indicate a minor decrease, highlighting the large uncertainty in future precipitation over this region. Although lacking clear trend in projected annual precipitation, by the end of the 21st century the average fall and spring precipitation is expected to decrease, with winter and summer precipitation increasing. Increasing variability is also projected in winter and fall precipitation. A summary of these projections is provided in COR Table 6-B.

COR Table 6-B Projected Change in Precipitation and Temperature Over the American River Basin Study Area Between 1980-2009 and 2070-2099

Season	Percent Change in Basin-Averaged Annual Mean Precipitation (%)	Change in Basin-Averaged Annual Mean Daily Air Temperature (°F)	Change in Annual Mean of Daily Maximum Air Temperature (°F)	Change in Annual Mean of Daily Minimum Air Temperature (°F)
Fall	-6.0	5.8	6.1	5.5
Winter	4.7	4.9	5.0	4.8
Spring	-11.9	5.8	6.3	5.1
Summer	10.4	7.2	7.3	7.0

6.14.3.3 Snowpack

Snow water equivalent (SWE) is a key indicator of water supplies in this region, where runoff is largely influenced by snowmelt. The increasing variability in precipitation combined with increases in surface air temperatures are key drivers in projections of a reduction in annual average SWE. Average SWE is forecasted to decrease by 50-85% across all climate scenarios and future time periods. In addition, areas that accumulate snow above Folsom Reservoir are also projected to have up to a 12-inch decrease in maximum snowpack by end of the century.

6.14.3.4 Evapotranspiration

Potential evapotranspiration (PET) serves as a key indicator of landscape water demands, including consumptive use by evaporation and transpiration from bare soil, water surfaces, native vegetation, and crops. Average annual PET is expected to increase 1.2 to 6.2 inches across all climate scenarios and future time periods. PET is strongly correlated with air temperature and thus expected to increase more under the hot scenarios (HD, HW) than under the warm scenarios (WD, WW).

6.14.3.5 Runoff

Watershed runoff is a direct indicator of local water supply available, as well as to statewide CVP-SWP system. Climate change projections indicate a pronounced shift in the distribution of runoff from May and June to earlier in the season (December to March), implying a transition in precipitation from snow to rainfall and/or earlier snowmelt and increasing the amount of runoff during the winter months. Peak runoff is expected to shift by more than a month earlier by mid to late century (Figure 6-4). Spring runoff will decrease due to reduced winter snowpack. Similar to the precipitation scenarios, there is large uncertainty in projected runoff where the 'wet' scenarios suggest an increase in annual runoff and the 'dry' scenarios suggest a decrease in annual runoff. The projected changes in basin wide runoff range from an increase of 486 thousand acre-feet (TAF) under the warm-wet scenario to a decrease of 203 TAF under the hot-dry scenario by the end of the century.

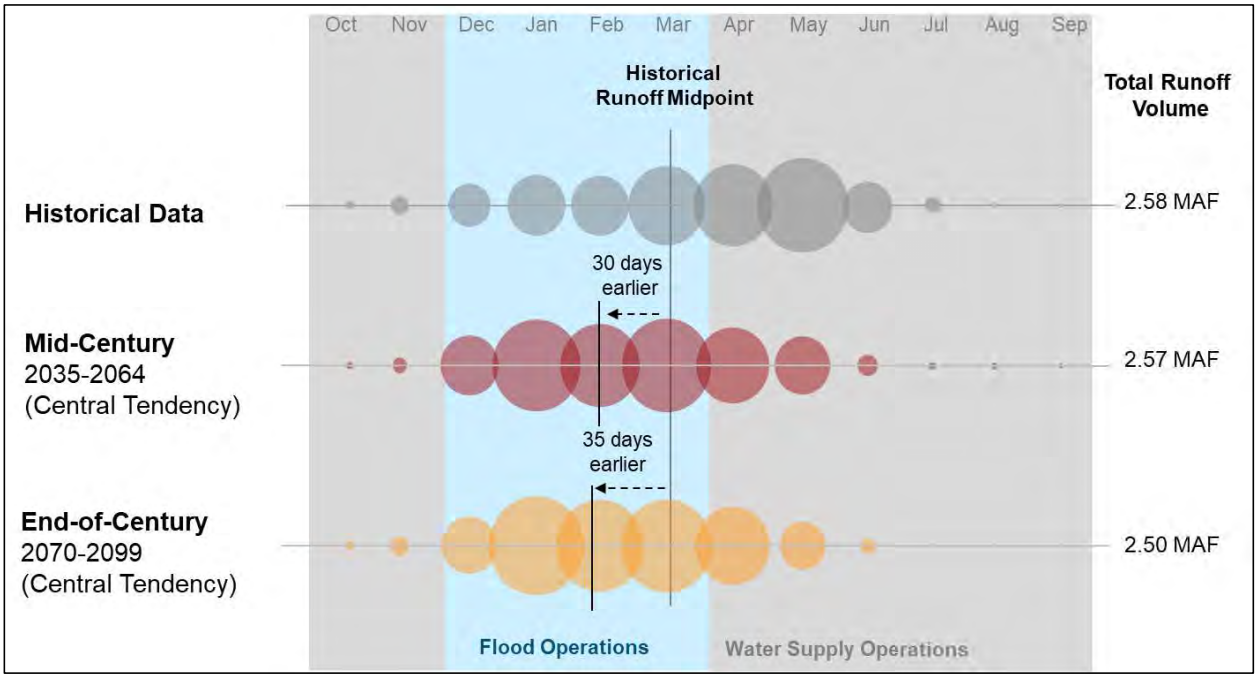


Figure 6-4: Distribution of Average Monthly Runoff for Historical Record (1922-2015) and Future Projections Under Central Tendency Climate Scenario

The change in annual climatic and hydrologic indicators between historical baseline observations (1915 to 2015) and projected future conditions for the ARBS area are listed in COR Table 6-C.

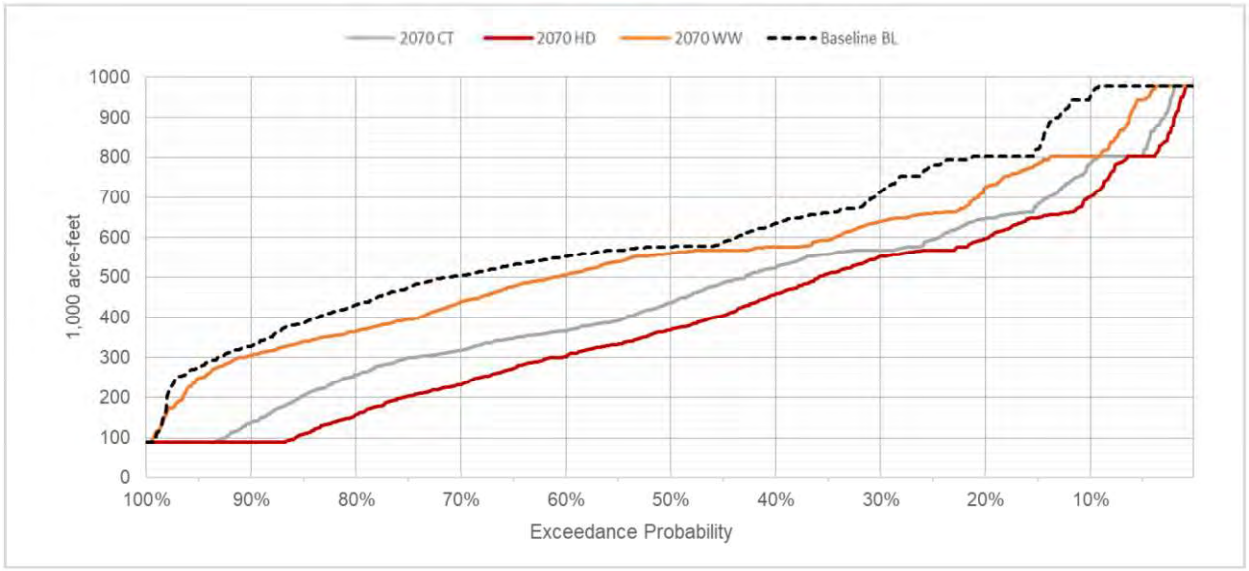
COR Table 6-C Change in Hydrologic Indicators Between Historical Observations and Projected Future Hydrology

Time Period	Climate Scenario	Precip (in)	T_{avg} (°F)	T_{max} (°F)	T_{min} (°F)	PET (in)	SWE_{avg} (in)	SWE_{max} (in)	Runoff (TAF)
1915-2015	Historical Observations	38.2	54.8	67.8	35.6	42.8	1.5	5.7	1,458
2040-2069	Warm-Wet	1.9	4	6.2	1.6	1.6	-0.7	-2.3	701
	Central Tendency	0.1	5	8.1	2.1	2.7	-0.9	-2.8	-2
	Hot-Dry	-2.8	6.2	10.4	2.7	3.7	-1.1	-3.4	-206
2055-2084	Warm-Wet	3.8	4.7	7.4	2	2	-0.8	-2.5	199
	Central Tendency	-1.1	6.3	11.1	2.6	4.1	-1.08	-3.5	-93
	Hot-Dry	-3.4	7.9	13.3	3.7	5	-1.2	-3.8	-185
2070-2099	Warm-Wet	7	5.4	8.3	2.5	1.8	-0.9	-2.9	486
	Central Tendency	-0.6	6.5	11	2.8	3.9	-1	-3.3	-54
	Hot-Dry	-4.6	8.9	15.7	4.1	6.2	-1.3	-4.3	-203

Water Supply Reliability

Changing climate conditions in the Sierra Nevada Mountains threaten the volume of water stored in the snowpack and the timing of runoff entering Folsom Reservoir. Consequently, they can also affect the critical role of Folsom Reservoir in the CVP Operations. Reliance on Folsom Reservoir is expected to increase commensurate with the

impact of sea level rise on salinity in the Delta. Modeling of these factors has illustrated that, without operational adjustments, Folsom Reservoir is projected to have lower end of conservation season (end of September) storage levels and approach "dead pool" more often under most future climate scenarios (see Figure 6-4). Similarly, increased early season runoff would increase flood risks along the Lower American River, leaving less water in the upper watershed available during water supply operations.



Key:
Baseline BL = Historic Conditions, 2070 CT = Central Tendency 2070 Climate Scenario, HD = Hot-Dry 2070 Climate Scenario, WW = Warm-Wet 2070 Climate Scenario

Figure 6-5 Exceedance Plot of Folsom Reservoir Storage (end of September) Under Future Climate Change

Under the 2070 level of development, the ARBS projects a supply-demand imbalance of 63 to 78 TAF/year in the Upper Basin (or Foothills Area) without further conservation or management actions. In the Lower Basin, groundwater extraction is expected to increase by 62 to 155 TAF/year to offset the projected imbalance, which would affect groundwater sustainability.

Based on the water supply and demand imbalance results, the region's water supply reliability has vulnerabilities. The ARBS assessed several adaptation portfolios for addressing the range of vulnerabilities and future supply-demand imbalances for the Study Area for regional benefits. Portfolios analyzed were:

1. Foundational Institutions
2. No Assurances for Long-term CVP Water Contract
3. Alder Creek Storage and Conservation Project
4. Sacramento River Diversion Project
5. Federally Recognized Groundwater Bank (North and South Basin)
6. Folsom Dam Raise with Groundwater Banking (South Basin)
7. Modified Flow Management Standard

The seven formulated adaptation portfolios were quantitatively evaluated using CalSim 3 to alleviate supply-demand imbalances and benefits to the region. The Study's intent was not focused on individual water-supplier's portfolio, but rather how the region could plan to increase regional reliability. The precise composition, scale,

operations, partnerships, funding, and governance to advance these project concepts will require further evaluations and coordination among Basin interests, including USBR, DWR, and SWRCB.

While climate change does have an impact on the basin, impacts are largely seen closer to the end of the century, and not within the timeline of the UWMP. Through proactive adaptation management actions, the Study highlights ways for the region to alleviate climate change impacts by the end of century. Therefore, in consideration of the timeline of the UWMP, the City of Roseville does not reflect any climate change impacts in supply and demand scenarios within this Plan.

6.15 Energy Intensity

A new requirement of the CWC, pursuant to 10631.2. (a), for 2020 UWMPs is that suppliers must include information that can be used to calculate energy intensity of their water service. Typically, a large portion of energy consumed in municipalities is dedicated to the conveyance, treatment, distribution, and storage of water. Maintaining water systems involves numerous pumps, motors, and other equipment which run for most or all hours of the day year-round. Because the water operations consume a significant amount of energy, these facilities can be a substantial contributor to greenhouse gas emissions in communities. Understanding how much energy is consumed at the City's various facilities is critical to ensure that the City is mindfully and efficiently utilizing energy resources.

An analysis of the energy intensity, which is the amount of energy consumed per the volume of potable water supplied, is provided in COR Table 6-D.

COR Table 6-D Energy Intensity Reporting

Start Date for Reporting Period	1/1/2020	Sum of Water Management Processes
End Date	12/31/2020	
Volume of Water Entering Process (AF)		32,300
Energy Consumed (kWh)		10,419,600
Energy Intensity (kWh/AF)		322.60
NOTES: Values include only water management processes that are under the City's operational control.		

The City treats and distributes the majority of its potable supply with the significant aid of gravity flow, from Folsom through the WTP and out into the distribution network throughout the City's service area. Data collected to support the analysis included in COR Table 6-D were primarily sourced from energy consumption billing data for the City's conveyance, treatment, distribution, and storage facilities for potable water. Where data was not available, estimates were made based upon similar facilities as well as calculations proportionate to the volume of water involved in the facility process. Some of the City's conveyance or distribution facilities do not have power sources or are owned by the adjacent utility and therefore do not represent consumption included in the calculation above.

Chapter 7 Water Service Reliability and Drought Risk Assessment

This chapter describes the long-term reliability of the City's water supply portfolio in all hydrologic year types through the year 2045. The City's existing and planned water management strategies and options for increasing the reliability of water supplies are also addressed. Shorter term reliability planning that may require immediate action, such as drought or a catastrophic supply interruption, is addressed in the Water Shortage Contingency Plan.

7.1 Constraints on Water Sources

This section addresses potential legal, environmental, water quality, and climatic effects on the reliability of water supply sources through the year 2045.

7.1.1 Legal Constraints

The City does not anticipate legal factors to affect the reliability of recycled water or purchased water supply within the planning horizon of this UWMP.

There are no existing legal constraints that limit groundwater pumping and the groundwater basin is not currently adjudicated. However, as an updated sustainable yield for the subbasin has yet to be defined under SGMA, the legal authority to enforce the sustainable yield of the subbasin has not been created, and the basin is subject to the users' cooperation in managing the basin until a formal authority is created. The City actively participates in regional discussions regarding best practices and cooperative management of water resources. These issues and concerns are being discussed in forums like the Regional Water Authority and as part of the Western Placer County Groundwater Management Plan along with sustainable groundwater management objectives and activities. The collaborative group of City of Roseville, PCWA, City of Lincoln, and California American Water is responsible for and has been identified as the responsible entity for monitoring groundwater levels meeting requirements of the 2009 SB X7-6 California State Groundwater Elevation Monitoring Program (CASGEM) program. Information gathered as part of this program was included in the groundwater model that was developed to support the ASR application with the Regional Water Quality Control Board to determine impacts of proposed extractions and injections related to groundwater levels in the region.

7.1.2 Water Quality Constraints

The City's water supply portfolio consists of high-quality surface water, recycled water, and groundwater resources. In some areas of the City, iron and manganese can be found in native groundwater at concentrations both above and below the secondary taste and odor maximum contaminant level established for these constituents. The City monitors groundwater quality closely, to ensure water provided for potable use does not exceed these standards.

7.1.3 Physical Constraints

The physical constraints of recycled water, surface water, and groundwater are discussed in the following sections.

7.1.3.1 Recycled Water

Recycled water is physically constrained by flows into the City's wastewater treatment plants. It is therefore seasonally available in higher quantities when demands are lowest during the wet season. The distribution

network of "purple pipe" is also a physical constraint for this supply source, as it only exists in the western portion of the City. Access to recycled water and its availability to offset potable needs are therefore, limited by physical access to this pipe network.

7.1.3.2 Surface Water

The City has identified its Folsom Lake intake as a likely physical constraint on current surface water supplies. All three surface water contract supplies are received through this point of diversion, making it a critical facility for the reliability of Roseville's surface water supply. If the water level of Folsom Lake were to drop close to or below the intake elevation as it nearly did in 2015, the City would not be able to divert water without additional infrastructure. The City is also able to receive supply through interties in emergency conditions; however, the WTP represents the primary diversion point. As a result of this vulnerability and lessons learned in the 2015 drought year, the City is actively exploring cooperative efforts with Folsom diversion and operation partners to duplicate or lower the intake facility to alleviate this concern. The City is likewise examining options for alternate diversion points or use of interties to increase reliability of physical water supply access.

The capacities of the Folsom Dam diversion, Roseville Water Treatment Plant, and distribution systems are sufficient to divert, treat, and convey the projected surface water demands. A 150 cubic feet per second (cfs) capacity limitations at the USBR pumping plant, which was agreed to based on recent pumping plant improvements, is sufficient to provide water to meet the City's needs.

7.1.3.3 Groundwater

The physical constraints on the current groundwater supply are the pumping capacities of existing wells. The total pumping capacities from all the six wells are about 11,050 GPM, approximately 15.9 MGD, per Chapter 3 . The City plans to install 6 additional wells by 2035 to provide additional groundwater supplies. Currently, the City plans to design all new wells with ASR capability to allow for greater groundwater banking and extraction capability throughout seasonal variations in surface water supply availability. Many of these planned well sites have been reassessed and relocated to areas of the City's surface are with more advantageous groundwater conditions as well as hydraulics with respect to the distribution network. Installation of wells higher in the hydraulic grade area of the system will allow for a greater downstream sphere of influence for this infrastructure and more flexible system operation in times of reliance on groundwater.

7.1.4 Other Constraints

Aside from legal and physical constraints, several other considerations affect the availability and reliability of Roseville's water supply portfolio. The City's purchased surface water supply is subject to reductions during dry years (seasonal and climatic shortages) pursuant to the Water Forum Agreement (WFA), the USBR Operations Criteria and Plan (OCAP), and the Central Valley Project Municipal and Industrial Water Shortage Policy (CVP M&I WSP). These agreements and programs are discussed in greater detail in the following subsections.

7.1.4.1 Sacramento Water Forum Agreement

The Sacramento Water Forum is a diverse group of business and agricultural leaders, citizen groups, and environmentalists, water managers, and local governments working together to balance two co-equal objectives:

1. **Provide a reliable and safe water supply for the Sacramento region's long-term growth and economic health.**
2. **Preserve the fishery, wildlife, recreational and aesthetic values of the Lower American River.**

The City, along with several other Sacramento-area water suppliers are signatory to the January 2000 Water Forum Agreement which includes Purveyor Specific Agreements, with the most recent revisions affected to these agreements in 2015. The Water Forum Agreement provides the framework for how water resources, including surface water and groundwater supplies would be used in the region, through the year 2030. The City's Purveyor Specific Agreement includes limitations on City surface water diversions from the American River under various hydrologic conditions. The Water Forum categorized water years into three types, all of which are defined in terms of the projected March through November unimpaired flow into Folsom Reservoir. These hydrologic year types are as follows in COR Table 7-A.

COR Table 7-A Water Forum Agreement Hydrologic Year Types

Year Type	Unimpaired Flow into Folsom Reservoir
Normal/Average or Wet Year	Greater than or equal to 950,000 AF
Drier Year	Between 400,000 and 950,000 AF
Driest/Critically Dry Year	Less than 400,000 AF

Although Roseville's water contract entitlements total 66,000 AF/yr, the City's diversions from the American River are limited by the WFA in normal/wet years, drier, and driest years. In normal/wet years, the City has agreed to limit surface water diversions from the American River to 58,900 AF/yr. In driest or critically dry years, the maximum diversion from the American River is limited to 43,800 AF/yr. In drier years, the City may divert an amount between 43,800 and 58,900 AF/yr from the American River, calculated linearly depending on the unimpaired flow into Folsom Reservoir, as shown in Figure 7-1.

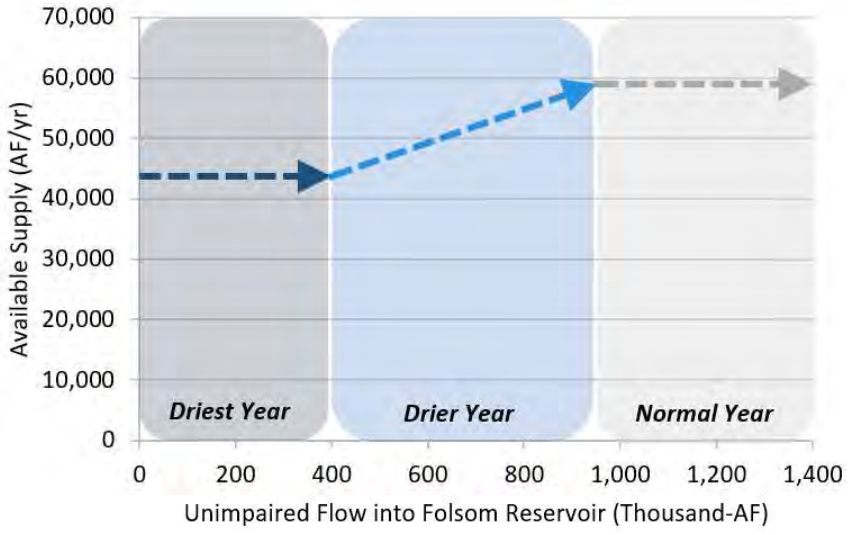


Figure 7-1 Water Forum Agreement Supply Limitations

It is important to note that during the drier and driest years, the City has an agreement with PCWA to release an additional 20,000 AF/yr of water down the American River on the City's behalf through re-operation of PCWA's American River Middle Fork Project (MFP). This 20,000 AF/yr of water is not part of the City's contracted supply of 66,000 AF/yr. The intent of the MFP re-operational releases during drier and driest years is to mitigate environmental impacts resulting from increased diversions above 1995 baseline levels.

7.1.4.2 USBR Operations Criteria and Plan

In addition to the WFA, the City's USBR water is also subject to restrictions as detailed in the 2004 Long Term Central Valley Project Operations and Criteria Plan (location on USBR's website). Chapter 5 of the OCAP entitled "Operations Forecasting" states that CVP allocations can be affected by:

- Forecasted reservoir inflows and Central Valley hydrologic water supply;
- Current amounts of storage in upstream reservoirs and in San Luis Reservoir;
- Projected water demands in the Sacramento Valley;
- Instream and Delta regulatory requirements;
- Annual management of 3406(b)(2) resources (related to fish and wildlife); and/or
- Efficient use of CVP-SWP export capacity through Joint Point of Diversion flexibility.

The OCAP includes a requirement that contractors be informed by USBR no later than February 15 of any possible deficiency in supplies that year. Since 1992, increasing constraints placed on operations by legislative and ESA requirements have made water delivery to CVP contractors more difficult, with recent drought conditions further impacting deliveries. Additionally, it is important to note that the City's USBR water deliveries may be curtailed purely based on downstream Delta conditions, irrespective of available upstream supply.

7.1.4.3 Central Valley and Industrial Water Shortage Policy

Upon a condition of shortage as determined by the OCAP, the CVP M&I WSP details the "incremental steps" by which available M&I water supply is allocated to the CVP water service contractors. From the November 2015 USBR news release, elements of the CVP M&I WSP include:

- Define water shortage terms and conditions for applicable CVP water service contractors, as appropriate.
- Determine the quantity of water made available to CVP water service contractors that, together with the M&I water service contractors' drought water conservation measures and other non-CVP water supplies, would assist the M&I water service contractors in their efforts to protect public health and safety during severe or continuing drought.
- Provide information to CVP water service contractors for their use in water supply planning and development of drought contingency plans.

The Final Environmental Impact Statement (EIS) describes the existing setting, alternatives for future operations under the CVP M&I WSP, and potential environmental impacts of each alternative. USBR selected Alternative 4, the Preferred Alternative, which comprises the Updated CVP M&I Water Shortage Policy developed by USBR with stakeholder input received during preparation of the Final EIS.

The decision will allow USBR the greatest degree of flexibility to address CVP water service contractors' needs during a Condition of Shortage while recognizing that CVP deliveries are subject to the amount of CVP water available. The Updated CVP M&I WSP also provides clarity to the terms, conditions, and procedures of the CVP M&I WSP. A copy of the November 2015 Final Record of Decision is included in Appendix J.

7.2 Water Supply Reliability Assessment

This section addresses the reliability of the City's water supply in average, single dry, and multiple dry water years. The City uses the following water year definitions from the DWR 2020 Guidebook:

COR Table 7-B Reliability Assessment Year Type Characterization

Year Type	Description
Average or Normal Year	A single year or averaged range of years that most closely represents the average water supply available to the Supplier.
Single Dry Year	The year that represents the lowest water supply available to the Supplier.
Five Consecutive Year Drought	The driest five-year historical sequence for the supplier.

The reliability of the potable and recycled water supplies is discussed in the following sections and are compared to the projected potable and recycled water demand.

7.2.1 Potable Water Supply and Demand Assessment

This section provides an assessment of the City's expected water supply and demand for Normal Year, Single Dry Year, and Five Consecutive Year Drought scenarios, based on data available at the time of publication of this UWMP, and discusses the City plans to mitigate potential supply deficits.

The City has identified the following base water years to represent the Year Types:

- **Average or Normal Year**: 2017
- **Single Dry Year**: 2015
- **Five Consecutive Year Drought**: 2011 - 2015

This City has identified these base water years based heavily on lessons learned through the droughts experienced in the last 10 years. In 2017, 100% of the typical contract supply was available, making it a good candidate to represent an average or normal year. In 2015, the City experienced a 75% curtailment of their USBR contract value – a source which had been considered highly reliable until that time. With only a 25% allotment, this represents the lowest experienced water supply level in Roseville's history. The time period between 2011 and 2015 represented multiple years of drought conditions and the lowest average available water supply experienced by the City, and therefore has been identified to represent the five consecutive year drought condition. Supply volumes for base years are provided in DWR Table 7-1.

DWR Table 7-1

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	% of Average Supply
Average Year	2017	64,279	100%
Single-Dry Year	2015	49,739	77%
Consecutive Dry Years 1st Year	2011	64,279	100%
Consecutive Dry Years 2nd Year	2012	59,430	92%
Consecutive Dry Years 3rd Year	2013	59,480	93%
Consecutive Dry Years 4th Year	2014	51,531	80%
Consecutive Dry Years 5th Year	2015	49,942	78%
NOTES: Groundwater is not utilized as a significant source of supply until a Drought Stage 3 is declared by the City. Totals include recycled water which is assumed to be available in all year types. All volumes are in AF.			

The City intends to use their groundwater supply differently in different year types. Under Normal Year conditions, the City intends to inject groundwater at an overall net benefit to the aquifer, or at most to extract groundwater up to the amount injected. In times of drought however, as in a Single Dry Year, or multi-year drought condition, the City can and will utilize their groundwater infrastructure as a larger percentage of overall supply. These assumptions and the resulting groundwater availability by year type are outlined in COR Table 7-C.

COR Table 7-C Groundwater Supply Availability by Year Type.

Groundwater Supplies and Management by Year Type					
Well Data	Operational ASR Wells	6	10	11	11
	Total Annual Extraction Capacity	17,600	28,000	32,100	32,100
	Total Annual Injection Capacity	7,000	12,100	14,900	14,900
Year Type	**Assumptions**	**2020**	**2030**	**2035**	**Buildout**
Normal	In a Normal Year, the City would only typically extract less than or equal to the volume injected. The injection window is estimated at **3 months** for the wet season when additional volume might be available, and **90% capacity** would be assumed to account for 10% down time for maintenance.	1,560	2,720	3,350	3,350
Single Dry	In a Single Dry Year, the City would expect to pump for **6 months** of the year at 9**0% capacity** to allow for 10% down time for maintenance.	7,920	12,570	14,430	14,430
Year 5 of a Multi-Year Drought	In the 5th year of a 5 -Year Drought, the City would expect to pump for **6 months** of the year at 9**0% capacity** to allow for 10% down time for maintenance.	7,920	12,570	14,430	14,430
NOTES: All values are in AF.					

The availability of total water supply from each source by hydrologic year type is outlined in COR Table 7-D.

COR Table 7-D Potable Supply Availability by Year Type

Potable Water Supply Availability by Source and Hydrologic Year Type						
Supply Source	**2020 (current)**	**2025**	**2030**	**2035**	**2040**	**2045**
NORMAL WATER YEAR						
USBR	32,000	32,000	32,000	32,000	32,000	32,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	4,000	4,000	4,000	4,000	4,000	4,000
Water Forum Limitation	-7,100	-7,100	-7,100	-7,100	-7,100	-7,100
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	60,460	60,460	61,620	65,610	65,610	65,610
SINGLE DRY YEAR						
USBR	8,000	8,000	8,000	8,000	8,000	8,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	7,920	7,920	12,570	14,431	14,431	14,431
Total	45,920	45,920	50,570	55,791	55,791	55,791
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 1						
USBR	32,000	32,000	32,000	32,000	32,000	32,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	4,000	4,000	4,000	4,000	4,000	4,000
Water Forum Limitation	-7,100	-7,100	-7,100	-7,100	-7,100	-7,100
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	60,460	60,460	61,620	65,610	65,610	65,610
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 2						
USBR	24,000	24,000	24,000	24,000	24,000	24,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Water Forum Limitation	0	0	0	0	0	0
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	55,560	55,560	56,720	60,710	60,710	60,710

FIVE CONSECUTIVE YEAR DROUGHT - YEAR 3						
USBR	24,000	24,000	24,000	24,000	24,000	24,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	55,560	55,560	56,720	60,710	60,710	60,710
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 4						
USBR	16,000	16,000	16,000	16,000	16,000	16,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	47,560	47,560	48,720	52,710	52,710	52,710
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 5						
USBR	8,000	8,000	8,000	8,000	8,000	8,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (future)	0	0	0	3,360	3,360	3,360
Groundwater	7,920	7,920	12,570	14,431	14,431	14,431
Total	45,920	45,920	50,570	55,791	55,791	55,791

NOTES: Groundwater more significantly relied on in single dry years and year 5 of a five consecutive year drought condition.
All values are in AF.

7.2.2 Comparison of Supply and Demand

A comparison of projected water supply and demand during Normal, Single Dry, and Five Consecutive Year Drought conditions are included in DWR Table 7-2, DWR Table 7-3, and DWR Table 7-4. It is important to note that in all scenarios shown in these tables, Normal Year demands are shown. As outlined in Chapter 4 , passive demand reduction savings are incorporated into the demand projections themselves; however, no specific conservation effort to reduce demands in a drought year have been shown in these tables in order to depict the most basic comparison of supply and demand in these year types. As shown, there is an adequate water supply in all normal years. In single dry years and in certain multiple dry years, water supply deficit may occur.

7.2.3 Recycled Water Supply and Demand Comparison

The City's recycled water supply is an important resource as it is considered to be 100% reliable in all water year types. Recycled water supply has been set equal to the projected recycled water demand in these analyses because showing a surplus recycled water supply would mask potential potable water shortages.

7.2.4 Total Water Supply and Demand Comparison

A comparison of projected total (potable and recycled) water supply and demand during a normal water year is included in DWR Table 7-2. As shown, there is an adequate water supply in normal years to meet demands through 2045.

DWR Table 7-2

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045
Supply totals	64,482	66,055	70,543	70,543	70,543
Demand totals	51,589	56,990	62,547	62,547	62,547
Difference	12,893	9,065	7,996	7,996	7,996
NOTES: An additional 3,360 AF of supply from the PCWA Ophir WTP is assumed to become available in all year types as of 2035. The City plans to have 4 new wells operational by 2030 with an additional 2 following by 2035, as well as the destruction of 1 existing. Supply and demand include Recycled Water. All volumes are in AF.					

A comparison of projected water supply and demand during a Single Dry Year is included in DWR Table 7-3.

DWR Table 7-3

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045
Supply totals*	49,942	55,005	60,723	60,723	60,723
Demand totals*	51,589	56,990	62,547	62,547	62,547
Difference	(1,647)	(1,985)	(1,824)	(1,824)	(1,824)
NOTES: An additional 3,360 AF of supply from the PCWA Ophir WTP is assumed to become available in all year types as of 2035. The City plans to have 4 new wells operational by 2030 with an additional 2 following by 2035, as well as the destruction of 1 existing. Supply and demand include Recycled Water. All volumes are in AF.					

A comparison of projected water supply and demand during a Five Consecutive Year Drought is included in DWR Table 7-4.

DWR Table 7-4

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025	2030	2035	2040	2045
First year	Supply totals	64,482	66,055	70,543	70,543	70,543
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	12,893	9,065	7,996	7,996	7,996
Second year	Supply totals	59,582	61,155	65,643	65,643	65,643
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	7,993	4,165	3,096	3,096	3,096
Third year	Supply totals	59,582	61,155	65,643	65,643	65,643
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	7,993	4,165	3,096	3,096	3,096
Fourth year	Supply totals	51,582	53,155	57,643	57,643	57,643
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	(7)	(3,835)	(4,904)	(4,904)	(4,904)
Fifth year	Supply totals	49,942	55,005	60,723	60,723	60,723
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	(1,647)	(1,985)	(1,824)	(1,824)	(1,824)
NOTES: An additional 3,360 AF of supply from the PCWA Ophir WTP is assumed to become available in all year types as of 2035. The City plans to have 4 new wells operational by 2030 with an additional 2 following by 2035, as well as the destruction of 1 existing. Supply and demand include Recycled Water. All volumes in AF.						

As stated in DWR Table 7-4, there is sufficient supply to meet demands in Normal Years through 2045. In Single Dry Years and some extended drought years, shortages do occur. DWR Table 7-2, DWR Table 7-3, and DWR Table 7-4 include recycled water supply and demand. The remaining deficits shown will be mitigated by potable water conservation measures implemented as part of the Water Shortage Contingency Plan.

7.2.5 Deficit Mitigation

Depending on the raw water supply available from USBR, and in accordance with the WFA, deficits in potable water supply may occur in a single dry year or the latter stages of an extended drought condition. As shown in DWR Table 7-3 and DWR Table 7-4, the greatest potential deficit between available supply and demand would occur in Year 4 of a Five Consecutive Year Drought condition.

One potential strategy to alleviate deficiencies shown above is indicated in DWR Table 7-5. In DWR Table 7-5, the potential volume of water resulting from potable water demand reductions are shown.

DWR Table 7-5

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)

	2021	2022	2023	2024	2025
Total Water Use	39,172	42,276	45,380	48,484	51,589
Total Supplies	64,279	59,430	59,480	51,531	49,942
Surplus/Shortfall w/o WSCP Action	25,107	17,153	14,100	3,047	(1,647)
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - supply augmentation benefit	0	0	0	0	0
WSCP - use reduction savings benefit	0	0	0	0	6,659
Revised Surplus/(shortfall)	25,107	17,153	14,100	3,047	5,013
Resulting % Use Reduction from WSCP action	0%	0%	0%	0%	13%

NOTES: Supply and demand totals include Recycled Water. Demand reductions actions only apply to the portion of total water use that is potable and not to the recycled water.

The City will determine the needed balance between water conservation and groundwater pumping on a case-by-case basis consistent with the City's Municipal Code. The City also continues to plan for and analyze opportunities for water supply projects or exchanges that would increase the reliability of the raw water supplies diverted from the American River.

7.3 Regional Supply and Reliability

All water consumed by the City comes from local supply sources. No water is imported from other regions, nor does the City anticipate importing water from other regions throughout the UWMP planning period. However, the City is actively engaged in multiple planning projects and coordination intended to strengthen water supply reliability throughout the Sacramento area, in addition to investing in long-term water storage projects like the future Sites Reservoir. Projects like Sites will not provide direct benefit in terms of water supply to Roseville; however, as a regional project it promises to strengthen the Northern California water portfolio as a whole, providing benefit to all who operate within this sphere. The City is a committed regional partner in working to solve supply shortage issues before they become a critical reality, with climate change and increasingly limited supply sources at the crux of the issue. The City will continue these efforts into the future and work with its partner agencies to find the best path forward.

Chapter 8 Water Shortage Contingency Plan

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a Water Shortage Contingency Plan (WSCP) be adopted by suppliers. A copy of the WSCP is provided in Appendix K.

Chapter 9 Demand Management Measures

This chapter describes the City's historical and existing water conservation program, status of implementation of Demand Management Measures (DMMs), and projected future conservation implementation. The CWC requires that the UWMP include a comprehensive description of historical, current, and projected water conservation programs.

> *CWC 10631 (e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*
>
> *(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*
>
> *(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*
>
> *(i) Water waste prevention ordinances.*
>
> *(ii) Metering.*
>
> *(iii) Conservation pricing.*
>
> *(iv) Public education and outreach.*
>
> *(v) Programs to assess and manage distribution system real loss.*
>
> *(vi) Water conservation program coordination and staffing support.*
>
> *(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

In previous UWMPs, a substantial amount of data was required to document a water supplier's progress in implementing fourteen specific DMMs. In 2014, Assembly Bill 2067 simplified, clarified, and updated reporting requirements for DMMs. Starting with the 2015 UWMP, focus has turned away from detailed descriptions of each of the fourteen DMMs and has turned to water conservation measures that are being implemented to achieve compliance with SB X7-7. For retail agencies, the number of DMMs has been reduced from fourteen to six (plus an "other" category). A narrative description of the status of the DMMs and how the DMMs will help the water supplier achieve its SBX7-7 water use targets is required. Detailed data are not required.

Members of the CUWCC may include their reporting in the UWMP, but a narrative is also required.

9.1 Demand Management Measures

The six DMMs required to be discussed in the 2020 include the following:

- Water waste prevention ordinances;
- Metering;
- Conservation pricing;
- Public Education and outreach;
- Programs to assess and manage distribution system real loss; and
- Water conservation program coordination and staffing support.

For each DMM, the current program is described, followed by a description of how the DMM was implemented over the previous five years and the planned implementation to achieve the water use targets required by SB X7-7, which is discussed in Chapter 5

9.1.1 Water Waste Prevention Ordinances

The City currently restricts water waste within its service area. Roseville Municipal Code Chapter 14.09, Water Conservation Ordinance (Appendix L), defines water waste and associated penalties of continued infractions. Per the ordinance, customers in violation are provided a series of notifications at one-week intervals: first a courtesy notice, second an administrative warning, and finally a formal citation. If the situation is not remedied by the time specified in the formal citation, additional measures can be taken to enforce compliance. These measures include fines, water restrictions, low flow devices, or discontinued service. In addition, the City may waive the courtesy notice and administrative warning in times of drought.

To enforce the Water Waste Ordinance, the City employs two 1,500 hour/year conservation workers to patrol within the service area limits. The City has also employed contract help at night to conduct water waste patrols. These patrol efforts are ramped up and down seasonally according to the intensity of landscape water usage. In addition, full-time City staff patrol for water waste as part of their normal job duties. In addition to patrols by City staff, the City has an online reporting mechanism that allows customers to report observed water waste anonymously. Customers can visit www.roseville.ca.us/waterwaste and submit an electronic form, which is then further investigated by City staff.

Implementation of this DMM is ongoing and expected to help the City achieve its water use targets by minimizing the nonessential uses of water so that the water is available to be used for human consumption, sanitation, and fire protection.

9.1.2 Metering

A meter retrofit program was developed and implemented from 2001 to 2011. Implementation of metered rates began immediately on all residential metered connections established after January 1, 2002, with the remaining retrofitted homes transitioned in large blocks as retrofits were completed. Customers were provided water use information for a period of one year before transition to volumetric billing began.

The metering DMM helps Roseville achieve its water use targets by providing accurate water use information to both the customer and the City. Higher than normal comparative usage triggers outreach to customers who may have leaks, as well as awareness of efficient water use practices. Overall, metering assists the City in managing customer water use and leak detection efforts.

9.1.3 Conservation Pricing

As a component of its meter retrofit program, the City adopted conservation pricing for water on all metered accounts from 2011 through 2015. Later, and to comply with Proposition 218 requirements, the City transitioned to a per-use, uniform billing rate structure in February 2016. A complete list of service charges, excess water use charges, and water rates are included in Roseville Municipal Code Sections 14.08.090 Service Charges for Metered Service through 14.08.100 Flat Water Rates. This information is included in Appendix M.

Implementation of this DMM is expected to help the City achieve its water use targets by ensuring water customers pay the true cost of water. The City regularly analyzes this cost of water production, capital improvement project needs, level of service requirements and other costs of operating the water system during regular rate studies. Where adjustments need be made, extensive public education efforts are undertaken to maintain transparency of utility operations and funding to support any required rate changes. Sufficient revenue will continue to be available to fund water system operations, maintenance, and water conservation programs.

9.1.4 Public Education and Outreach

The City promotes water conservation and other resource efficiencies in coordination with the Regional Water Authority (RWA), Roseville Electric, and Roseville's Public Information Department. The City distributes information through paid advertisements, television commercials, featured segments on the local government access channel, the internet (through the City's website and streaming video), the City's Utility Exploration Center, several water efficient workshops each year, movie theater ads, newsletters, bill inserts, mill messages, brochures, vehicle decals, community outreach events, community speaker bureaus, and yearly special events.

9.1.4.1 Customer Water Usage Portal

The City plans to implement a customer portal as part of the implementation of Advanced Metering Infrastructure (AMI) which is currently underway. This portal will provide residents with an ability to view their past usage and identify any changes in use patterns that may indicate leaks or opportunities for implementing cost savings by conserving water.

9.1.4.2 Utility Exploration Center

In 2008, the City's utilities jointly funded and created the Roseville Utility Exploration Center (UEC). In addition to serving as a "storefront" for the utilities, the Center is used by the City for community outreach and environmental education. Designed for an interactive experience, the UEC hosts multiple hands-on exhibits with a "learning lab" for demonstrations, presentations, and workshops. Topics include water conservation and watershed protection, energy efficiency, waste reduction, and wastewater management.

Since opening, the Utility Exploration Center has hosted over 640,000 program participants, with approximately 5,000 student (preschool through sixth grade) to the exhibit hall; partnered with cultural, recreational, and utility-related organizations to create a lively series of changing events, workshops, and activities; and connected with residents in a variety of off-site outreach activities.

The Center is housed within the Gold LEED (Leadership in Energy and Environmental Design) certified Martha Riley Library building, which was the first building in Placer County to be so honored. Future plans include the "Inspiration Garden," an outdoor learning space created in partnership with Roseville's Water Efficiency division, with a goal of encouraging more residents to adopt water-wise gardening practices. The garden is planned for completion by summer 2021. Plans are also underway to update the original visitor center exhibits. A larger outdoor project, originally called the IDEAscape, would further expand exhibits to include topics such as river-friendly landscaping and irrigation, utility systems, solar energy, and watershed protection. The project is currently on hold but is anticipated for completion by 2030.

9.1.4.3 Student Outreach

In addition to Regional Water Authority (RWA) student outreach programs, the City independently provides presentations, conservation materials, and facility tours to local schools.

9.1.5 Regional Water Authority – Outreach and Education

In addition to local public education and outreach programs, the City also participates in a regional public education and outreach program through the Regional Water Authority (RWA). RWA is a joint powers authority formed in 2001 to promote collaboration on water management and water supply reliability programs in the greater Sacramento, Placer, El Dorado, Yolo, and Sutter counties. In collaboration with 19 water provider members and other wastewater, stormwater, and energy partners, RWA formed the Water Efficiency Program (WEP) in 2001 to bring cost effectiveness through economies of scale to public education and outreach activities.

The WEP operates on an average annual budget of $530,000 and is supplemented by grant funding. Grants are an important funding resource for the Program. Since 2003, the Program has been awarded $13.2 million in grant funding for public outreach and education as well as a variety of rebate programs, fixture direct install programs, system water loss, individualized customer usage reports, large landscape budgets and more. Of those funds, $3.8 million was awarded between 2016 and 2020.

The main function of the WEP is to develop and distribute public outreach messages to customers in the region by collaborating with its water provider members. The Program distributes these messages on a regional scale through regional media and advertising buys and was honored with the United States Environmental Protection Agency WaterSense Excellence in Education and Outreach Award in 2016. From 2016-2020, the WEP created a series of public outreach campaigns. A summary of each campaign and highlighted achievements is as follows.

Following the historic 2015 California drought, the WEP launched the “Rethink Your Yard” Campaign in 2016 with a focus on prioritizing landscape watering, putting trees first and transitioning thirsty lawn and landscaping to beautiful, low water use, River-Friendly landscapes. The Program advertised the campaign through online ads, social media, commercial radio, Raley Field (local baseball stadium) and local billboards. The campaign featured local homeowners with their newly redesigned yards on billboards throughout the region.

The campaign launched in 2017 focused on encouraging customers to understand and deliver the amount of water their landscape really needs and to make permanent equipment changes to improve efficiency such as installing weather-based irrigation controllers, more efficient sprinklers and drip irrigation. The Program partnered on this messaging with local nurseries through a “Get Growing this Fall” initiative to encourage residents to plant in the fall when days are cooler and plants don’t need as much water to establish roots.

From 2018 through 2020, the regional campaign focused on tackling the landscape overwatering problem with a “Check and Save” message encouraging residents to check the soil moisture with a moisture meter before turning on sprinklers. To support this message, the Program provided free froggy moisture meters via an online request form and at events. In 2019, WEP distributed 3,000 moisture meters to customers throughout the region.

These campaigns are implemented through both paid advertising buys and earned media from public service announcements (PSAs). Every year the campaigns can be heard on local radio stations such as Capital Public Radio

and online through google, Facebook and YouTube advertisements. From 2016-2020, the WEP public outreach campaigns produced:

- Radio Advertising (2016-2020)
  3,443 radio advertisements ran
  17.2 million impressions

- Digital Advertising (Facebook, Google Display Network and Spotify) (2016-2020)
  24.3 million impressions
  262,900 clicks

- Additional advertising (billboards in 2016)
  1.8 million digital advertisements ran
  51.6 million impressions

- Public Service Announcements (Television and Radio) (2016-2020)
  20 million impressions
  $570,000 in value had they been purchased as advertising

The Program also continues messaging through its own Facebook page. From 2016-2020, the Program created about 60 Facebook posts a year featuring water saving tips and other relevant information. The WEP hosted several Facebook sweepstake contests including: Tree Hugger in 2016, where participates submitted pictures hugging a tree to raise awareness about the importance of healthy trees and the Under/Over Debate in 2020, where participates were asked to weigh in what is the proper way to hang toilet paper to raise awareness of toilet leaks. The winner of the Under/Over Debate sweepstakes received a case of toilet paper delivered via mail and gift card to a local hardware store.

The Program continues to utilize the public outreach website bewatersmart.info to reach customers throughout the region. The website contains regional and local water provider information on rebates and services, top ways to save, an interactive watering and water waste information map, a water-wise gardening database, recent press releases, the Sacramento Smart Irrigation Scheduler tool, and more. Educational information and customer services were modified to address the COVID pandemic in 2020 including online water efficiency lessons for kids, a list of nurseries that offered curbside pickup, virtual water wise house calls and numerous virtual educational customer workshops. Between 2016 and 2020, the website averaged 96,000 unique visitors per year.

For more targeted outreach, the Program distributed quarterly e-newsletters to participating residents. The e-newsletters are filled with water savings tips, upcoming events, and other interesting articles. They are usually timed around changes in the weather to help signal the need for residents to adjust their irrigation systems, such as day light savings coupled with a message to dial back sprinkler systems. The e-newsletter reaches 6,300 households.

Every year the WEP selects 3 public events to attend for the public to interact with local water efficiency staff. These events provide an opportunity for the region to communicate its messages in person. Events have included the Sacramento Home & Landscape Show at Cal Expo, Creek Week, Harvest Day, Farm-to-Fork Festival, and several Earth Day events. Additionally, RWA, in coordination with participating local water providers, hosts an annual

Mulch Mayhem event in which customers can pick up a truck load of free mulch from selected locations throughout the region. All in-person regional events were canceled in 2020 due to the COVID pandemic.

The Program is also very active in communicating to local media outlets such as the Sacramento Bee. Between 2016 and 2020, RWA issued 50 press releases on WEP activities and regionally significant news and participated in nearly 30 radio public affairs interviews. The RWA and the WEP were mentioned in dozens of news articles published by local and regional media outlets both within and outside of the Sacramento region during the same time frame.

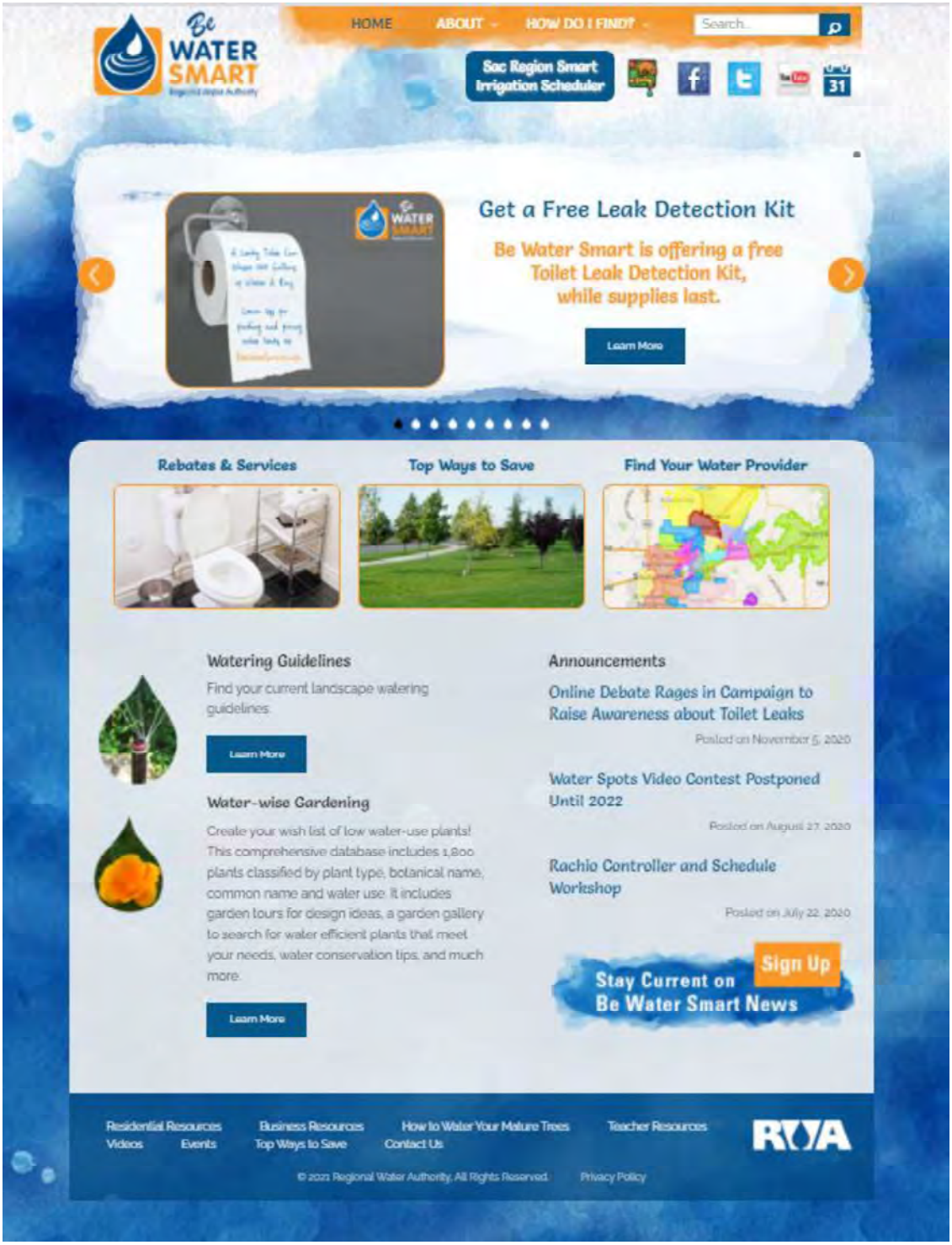
To support public outreach messaging and water savings tips, the Program also coordinated several regional rebate programs, which were partially funded by state and federal grants. A variety of rebate options were provided including toilets, clothes washers, and irrigation efficiencies (full summary in COR Table 9-A). Collectively, these rebates and installations will produce an estimated lifetime (10 years) savings of 6 billion gallons of water and 6.4 million kilowatt hours of energy.

COR Table 9-A Regional Rebates and Installations from 2016 through 2020.

Rebate/Installation Type	2016	2017	2018	2019	2020	Lifetime Water Savings per Type 2016-2020 (MG)	Lifetime Energy Savings per Type 2016-2020 (kWh)**
High Efficiency Clothes Washers Rebates	491	480	453	366	518	111.2	118,094
High Efficiency Toilets Rebates	4,494	3,124	2,255	1,868	904	512.3	544,076
Smart Irrigation Controllers Rebates	245	358	801	556	1,298	667.9	709,299
Irrigation Efficiencies Rebates*	21,271	5,879	5,548	1,724	NA	3,786.4	4,021,178
Turf Replacement Rebates (square feet)	376,613	584,535	236,064	85,375	NA	474.6	503,980
Toilet Direct Installation	1,943	4,542	968	NA	NA	237.4	252,066
Showerhead Direct Installation	1,141	2,512	704	NA	NA	222.6	236,447
Faucet Aerators Direct Installation	1,162	4,314	317	NA	NA	18.5	19,648
Urinal Direct Installation	NA	403	73	NA	NA	10.2	10,878
Total Water Savings per year/Lifetime (MG)	285.9	138.2	104.4	42.9	32.8	6,041.1	
Total Energy Savings per year/Lifetime (kWh)**	303,626	146,717	110,915	45,509	34,799		6,415,665
* Includes: pressure regulator equipment, pipe and pipe fittings, drip or low volume equipment, and sprinkler heads or nozzles.							
**Regional average of 1,062 kilowatt hours per MG							
kWh = kilowatt hours							
MG = million gallons							
NA = no funding available							
Lifetime = 10 years							

In addition to public outreach, the Program also coordinates school education activities. Since 2012, the Program has hosted the Water Spots Video Contest for high school and middle school students. The WEP provides a new contest theme each year and provides the region's teacher and students with relevant facts and images to help develop 30 second video PSAs. Students submit their videos to RWA who hosts a panel of local celebrities including Monica Woods from ABC 10 to decide on a first, second and third place winner. The top 10 scoring videos are then posted online for public voting to select a "people's choice" winner as well. Both teachers and student receive cash prizes and the winning videos are played at Raley Field during River Cats games and in select movie theaters throughout the region. The winning PSAs are incorporated into the WEP's media activities as well. Past themes include *WATER MYTHS BUSTED!, H2o Hero, and Show Off Your Water Smarts.* Between 2016 and

2019, 450 videos were submitted (average of 90 videos a year). The 2020 Water Spots Video Contest was canceled due to the COVID pandemic.



9.1.6 Programs to Assess and Manage Distribution System Real Loss

The City maintains a comprehensive water audit and leak-detection program to assess, identify, and repair potable distribution system losses.

In 2009, the City began using AWWA Water Loss software to develop an annual water loss audit. The City continues to employ this method in compliance with Senate Bill 555, validating the annual audit for accuracy prior to submission to DWR each year by the regulatory deadline of October 1. Results from the audit have helped the City identify where in the distribution process leaks are occurring. This information is coupled with detailed pipeline information stored in the City's asset management and GIS system. Audit information helps identify potentially leak prone areas of the City's distribution system for focused rehabilitation or repair projects. The City has recently implemented a proactive auditory leak detection program by City crew members in addition to the audit analyses to identify leaks. Additionally, an independent desktop analysis of potential areas of loss is planned for the coming year. Once these areas are isolated, responses include corrosion monitoring programs, service cathodic protection, relining and/or replacement. The City's asset management software is then updated with identified leaks, which in turn provides more information useful for prioritization of future rehabilitation programs. In 2020, the City began design of a project to rehabilitate 8 miles of water main in the downtown area to improve the function and longevity of the mains, reducing water loss through older pipes in this area of town.

The City also employs a third-party leak detection service on an annual basis to perform focused auditory surveys for leaks, in addition to in-house training and leak detection processes executed by City operations staff throughout their regular maintenance operations. In combination, these measures and projects employed to identify and reduce system leakage offer the City a comprehensive and proactive approach to the reduction of lost water supply.

9.1.7 Water Conservation Program Coordination Staffing Support

In addition to the employees mentioned in Section 9.1.1, the City employs other individuals as members of the City's internal water conservation program team. Member qualifications include: Certified Landscape Irrigation Auditor (CLIA) certification, Water Distribution Operator D-2 certification, and extensive irrigation system management experience.

In compliance with DWR's UWMP guidelines, the cull contact information for the City's Water Conservation Administrator is listed below:

Bobby Alvarez
Water Conservation Administrator
City of Roseville, Environmental Utilities Department
916-746-1710 (office)
BAlvarez@roseville.ca.us

9.2 Other Demand Management Measures

In addition to the six DMMs described above, the City also implements the following programs:

- Residential Water Wise House Calls

- Residential HET Replacement Program
- Residential Irrigation Rebates
- Residential Cash for Grass Rebates
- Commercial Irrigation Water "Budgets"
- Commercial Irrigation Audit
- Commercial Cash for Grass Rebates
- Commercial Custom Rebate
- Commercial Irrigation Improvements Rebates
- Commercial Food Service Water Efficiency Rebates
- Commercial Landscape Water Use Reviews
- Commercial Interior Water Use Audits
- Commercial Water Waste "Night Patrols"
- Commercial HET Replacement Program

These programs are described in Section 9.2.

9.2.1 Residential Conservation Programs

The City implements several programs to reduce the consumption of water to its residents. The activities of these various programs are described in the following subsections. Implementation of these programs is expected to help the City achieve its water use targets by reducing the amount of water consumed by its residential customers.

9.2.1.1 Water Wise House Calls

The City provides a free home water use inspection service known as the Water Wise House Call Program. Inspections are conducted by trained water conservation technicians and help identify potential water savings for the customer.

Single-family inspections are approximately one hour in length and consist of an indoor and outdoor evaluation. During the interior portion of the inspection, the technician measures flow rates of existing plumbing fixtures (offering high-efficiency alternatives if necessary), checks all fixtures and appliances for leaks, and provides information on the City's currently available rebate programs (further described in Sections 9.1.2, 9.1.3, and 9.1.4).

Following the indoor evaluation, the technician then conducts an outdoor inspection. A typical outdoor inspection tests sprinkler system efficiency, distribution uniformity, pool equipment, as well as an evaluation for leaks via pressure test. Following the sprinkler test, soil moisture probes are utilized to optimize irrigation scheduling through adjustment of the residence's irrigation controller.

Finally, water use information is reviewed, and the customer is provided with suggested corrective actions, information regarding the City's rebate programs, and educational material on how to further water conservation.

In addition to local advertising, Water Wise House Calls are actively marketed to high water use customers by the City's Water Efficiency Division. In 2020, modifications were made to this program to adhere to recommended safety procedures in consideration for the global health crisis caused by COVID-19. Adjusted Water Wise House Calls continue to be conducted in a safe manner for both residents and City employees.

9.2.1.2 Residential High Efficiency Toilet Replacement Program

The City first established a HET rebate program in 2008. Residents can receive up to $100 for replacing an older (pre-1992), non-conserving toilet with a new 1.28 gallon per flush model. Rebates are offered on a first come/first service basis to customers on an annual basis, and the program is advertised regularly on Roseville's Channel 11, bill inserts, conservation articles, newsletters, and the City's website. Customers can also obtain an application by request through the mail or at special events and City office public counters.

The City continued this rebate until 2018 when market saturation caused the water savings realized by this program to diminish significantly. This program is currently under reevaluation to determine whether the current terms and conditions bear revision to reinstate the program. Each year new opportunities are explored, and existing rebate programs evaluated for effectiveness as the City works to offer a suite of available opportunities to residents.

9.2.1.3 Residential Cash for Grass

In 2008, Roseville created a turf replacement program titled "Cash for Grass" that provides incentive for customers to replace their turf with water efficient landscaping. Turf is purchased at $1.00 per square foot up to $1,000 per residential site. To comply, participants must not only remove their turf but also install a low-volume irrigation system to irrigate their new water efficient landscape.

9.2.2 Commercial, Industrial, Institutional Conservation Programs

The City implements several programs to reduce the consumption of water to its commercial, industrial, and institutional customers. The activities of these various programs are described in the following subsections. Implementation of these programs is expected to help the City achieve its water use targets by reducing the amount of water consumed by its non-residential customers.

9.2.2.1 Irrigation Water "Budgets"

The City has developed water "budgets" for the majority of its dedicated irrigation accounts (including those owned by the City). These budgets were created using the City's geographical information system (GIS) to determine irrigated landscape area and then field verified for accuracy. The budget reports, produced monthly, show the site's actual water use compared to the estimated water use based on site demographics. If a site's water usage is significantly greater than expected, City staff may request the site's owner complete a site water audit.

9.2.2.2 Irrigation Audit

Similar to Water Wise House Calls, the City provides a free landscape audit service for irrigation customers upon request. Staff evaluates the irrigation system and makes recommendations for improvement. Rebates are available to further incentivize the customer to make improvements to their irrigation systems.

The City will continue to implement this program and will consider expansion based on the past years' participation.

9.2.2.3 Commercial Cash for Grass

Similar to the Residential Cash for Grass Program, the City offers rebates to commercial customers for replacing turf with water efficient landscaping. Commercial customers can receive $2.00 per square foot.

9.2.2.4 Commercial Irrigation Improvement Rebates

The City offers a suite of rebate opportunities for commercial irrigation customers including for conversion to drip irrigation, high efficiency nozzles, self-adjusting controllers, pressure regulators, as well as installation of irrigation submeters for a total potential rebate value of $15,000 for those who meet the established criteria for their projects. Applications for these rebates are easily accessed through the City's website with clear outlines of qualifying equipment and labor for ease of submission.

9.2.2.5 Commercial Food Service Water Efficiency Rebates

The City also offers a series of rebates available to commercial customers in the food service industry, with a "One-Stop Program" through which they can apply for applicable benefits on the purchase and replacement of cooking appliances (steamers and combination ovens), sanitation equipment (dishwashers), as well as refrigeration equipment (ice machines) with improved efficiency.

9.2.2.6 Customized Rebate Program

In addition to the above rebates, the Customized Rebate Program helps commercial, industrial, and institutional customers save money with financial incentives on capital expenditures for retrofit of existing equipment with more water-efficient technologies. This program applies to hardware upgrades including equipment and technology for space cooling, refrigeration, laundry, cleaning, and flushing. The customized rebate amount is derived by measuring current usage of the process compared to the water usage of the new retrofitted process. Water savings are estimated using the number of days operated per year and the expected life of the equipment (capped at 10 years). Total amount of saved water is rebated at $0.50 per 100 cubic feet. Rebates will be paid on a first-come, first served basis until program funds are depleted.

9.2.2.7 Commercial Interior Water Use Audit

The Commercial Interior Water Use Audit assists commercial properties in lowering water, wastewater, and energy costs. A facility review identifies equipment inefficiencies and provides a detailed report of all inefficiencies and corresponding recommendations.

9.2.2.8 Night Patrols

The City has implemented a Night Patrol program during peak water usage months that helps to identify commercial water waste after normal business hours. Patrols are typically conducted several nights per week.

9.2.2.9 Commercial High Efficiency Toilet Replacement Program

Similar to the Residential High Efficiency Toilet Replacement Program, commercial customers can receive up to $175 for replacing an older (pre-1992), non-conserving toilet with a new 1.28 gallon per flush model.

9.3 Planned Implementation to Achieve Water Use Targets

In most instances, helping customers understand the savings that can be achieved and methods available to achieve these savings is enough to motivate change. Through the above DMMs, the City can help customers

identify these savings, which in turn helps the City to achieve its water use targets. Additionally, the City will continue to work with the Parks Department, area school districts, landscape contractors, and property managers to improve water use efficiency.

9.4 Members of the California Urban Water Conservation Council

In 1991 (amended September 16, 1999), an MOU regarding urban water conservation in California was made that formalizes an agreement between DWR, water utilities, environmental organizations, and other interested groups to implement Best Management Practices (BMPs) and make a cooperative effort to reduce the consumption of California's water resources. This MOU is administered by the California Water Efficiency Partnership (CalWEP).

In 1991, Roseville became a voluntary signatory of CalWEP's MOU (formerly the California Urban Water Conservation Council or CUWCC). Since becoming a signatory to the MOU, the City has implemented and promoted its water use efficiency programs to help customers reduce water demand. The City reports to CalWEP on its coverage of the recommended BMPs on a calendar year basis.

The Urban Water Management Planning Act (Water Code Section 10631 (j)) allows for an urban retail water agency that is a signatory member of CalWEP to meet the DMM requirements by documenting that CalWEP has determined the urban water agency is complying (coverage) with all of the provisions of the MOU. Documentation of the City's compliance is provided in Appendix N.

Chapter 10 Plan Adoption and Submittal

This chapter provides information regarding the notification, public hearing, and adoption of the plan.

10.1 Inclusion of all 2020 Data

Because 2020 is the final compliance year for SB X7-7, the 2020 UWMPs must contain data through the end of 2020. If a water supplier bases its accounting on a fiscal year (July through June) the data must be through the end of the 2020 fiscal year (June 2020). If the water supplier bases its accounting on a calendar year, the data must be through the end of the 2020 calendar year (December 2020).

As indicated in Chapter 1, the City uses a calendar year for the water supply and demand accounting, and therefore this 2020 UWMP includes data through December 2020.

10.2 Notice of Public Hearing

The City provided 60-day notice of the preparation of its 2020 UWMP, and the notice of the 2020 UWMP Public Hearing to the cities and counties listed in DWR Table 10-1.

DWR Table 10-1

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
City of Roseville	☑	☑
County Name	60 Day Notice	Notice of Public Hearing
Placer County	☑	☑

Other agencies notified included the following:

- California American Water
- Citrus Heights Water District
- Placer County Water Agency
- Regional Water Authority
- San Juan Water District
- Sacramento Municipal Utilities District
- Sacramento Suburban Water District
- US Bureau of Reclamation

Public hearing notifications for adopting the Plan were published in the local newspaper (Roseville Press Tribune) and on the City's website. Copies of the published Notice of Public Hearing will be included in Appendix B.

10.3 Public Hearing and Adoption

The City has encouraged community and public interest involvement in the Plan update through the use of public meetings and web-based communication. Copies of the City's outreach efforts are included in Appendix B.

The public hearing will provide an opportunity for all City water users and the general public to become familiar with the Urban Water Management Plan as well as the Water Shortage Contingency Plan and ask questions about its contents. In addition, the hearing presents an opportunity for the public to learn about or comment on the City's continuing plans for providing a reliable, safe, high-quality water supply. Copies of the draft Urban Water Management Plan, including the Water Shortage Contingency Plan, are available for public inspection on the City's website. The public hearing will be held on June 16, 2021.

Copies of the adoption resolutions will be provided in Appendix O, in the final UWMP and WSCP.

10.4 Plan Submittal

A copy of the 2020 UWMP will be submitted to DWR within 30 days of adoption and by July 1, 2021. The adopted UWMP will be submitted electronically to DWR using the WUEdata submittal tool. A CD or hardcopy of the adopted 2020 UWMP will also be submitted to the California State Library.

No later than 30 days after adoption, a copy of the adopted 2020 UWMP, including the Water Shortage Contingency Plan, will be provided to the cities and counties to which the City provides water.

10.5 Public Availability

No later than 30 days after submittal to DWR, copies of this 2020 UWMP will be available for public review at the City's public offices. An electronic copy of this Plan will also be available for review and download on the City's website: www.roseville.ca.us/UWMP.

10.6 Public Implementation

This Plan will be the source document for any Senate Bill 610 Water Supply Assessment or Senate Bill 221 Water Supply Verifications required for any proposed projects between 2021 and 2025 that are subject to the California Environmental Quality Act (CEQA) and would demand an amount of water equivalent or greater than the amount of water by a 500-dwelling unit project. This Plan will also be the source document for water demand projections and water supply availability. Lastly, this Plan will provide guidance and direction on development of new local supplies and implementation of water conservation programs and recycled water expansion to meet the requirements of the Water Conservation Act.

10.7 Amending an Adopted UWMP

If the City amends its 2020 UWMP or the Water Shortage Contingency Plan contained therein, copies of amendments or changes to the plans will be submitted to DWR, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

10.8 California Water Code Requirements

Demonstration of compliance with all applicable requirements of the California Water Code pertaining to Urban Water Management Plan and Water Shortage Contingency Plan is provided in Appendix P. Appendix P was developed based on the UWMP Checklist provided in the Guidebook and is organized by subject.

Appendix A – Notifications to Wholesale Suppliers

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Jeremy Shepard, Director of Technical Services
Placer County Water Agency
PO Box 6570
Auburn, CA 95604-6570

RE: City of Roseville 2020 Urban Water Management Plan Demand Projections

Dear Mr. Shepard:

We sent notice earlier this year to inform you that the City of Roseville (City) Water Utility had begun preparation of the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10631, as the City is a retail water supplier receiving water from your agency, we have provided you with projected water use through 2045 in the below table.

Supply Source	2025	2030	2035	2040	2045
Placer County Water Agency Existing Contracts	30,000 AF	30,000 AF	30,000 AF	33,360 AF	33,360 AF
Placer County Water Agency Future Ophir WTP	–	–	Up to 3.6 MGD	Up to 3.6 MGD	Up to 3.6 MGD

A complete draft of the 2020 Urban Water Management Plan, which is inclusive of the newly required Water Shortage Contingency Plan, can be accessed at www.roseville.ca.us/UWMP. A public hearing of the Water Shortage Contingency Plan and Urban Water Management Plan will be held on June 16th at 6 pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

Should you wish to contact the City regarding either of the plans, you may do so by writing or emailing to the undersigned below. Thank you.

Sincerely,



Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department
TJoseph@roseville.ca.us

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Paul Helliker, General Manager
San Juan Water District
9935 Auburn-Folsom Road
Granite Bay, CA 95764

RE: City of Roseville 2020 Urban Water Management Plan Demand Projections

Dear Mr. Helliker:

We sent notice earlier this year to inform you that the City of Roseville (City) Water Utility had begun preparation of the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10631, as the City is a retail water supplier receiving water from your agency, we have provided you with projected water use through 2045 in the below table.

Supply Source	2025	2030	2035	2040	2045
San Juan Water District	4,000 AF	4,000 AF	4,000 AF	4,000 AF	4,000 AF

A complete draft of the 2020 Urban Water Management Plan, which is inclusive of the newly required Water Shortage Contingency Plan, can be accessed at www.roseville.ca.us/UWMP. A public hearing of the Water Shortage Contingency Plan and Urban Water Management Plan will be held on June 16th at 6 pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

Should you wish to contact the City regarding either of the plans, you may do so by writing or emailing to the undersigned below. Thank you.

Sincerely,



Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department
TJoseph@roseville.ca.us

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Drew Lessard, Area Manager
Central California Area Office
7794 Folsom Dam Road
Folsom, CA 95630

RE: City of Roseville 2020 Urban Water Management Plan Demand Projections

Dear Mr. Lessard:

We sent notice earlier this year to inform you that the City of Roseville (City) Water Utility had begun preparation of the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10631, as the City is a retail water supplier receiving water from your agency, we have provided you with projected water use through 2045 in the below table. The City plans to make full beneficial use of each year's allotments.

Supply Source	2025	2030	2035	2040	2045
US Bureau of Reclamation	32,000 AF	32,000 AF	32,000 AF	32,000 AF	32,000 AF

A complete draft of the 2020 Urban Water Management Plan, which is inclusive of the newly required Water Shortage Contingency Plan, can be accessed at www.roseville.ca.us/UWMP. A public hearing of the Water Shortage Contingency Plan and Urban Water Management Plan will be held on June 16th at 6 pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

Should you wish to contact the City regarding either of the plans, you may do so by writing or emailing to the undersigned below. Thank you.

Sincerely,



Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department
tjoseph@roseville.ca.us

From:	Joseph, Trevor
To:	Jeremy Shepard; Darin Reintjes
Cc:	York, Linda; Bigley, Sean
Subject:	City of Roseville 2020 Urban Water Management Plan Demand Projections
Date:	Tuesday, May 25, 2021 12:09:00 PM
Attachments:	PCWA_Technical Services Director ldy.pdf image001.png

Hi Jeremy and Darin –

Please see the attached letter as part of the Urban Water Management Plan requirements informing PCWA of our projected water use.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747



From:	Joseph, Trevor
To:	Helliker, Paul (San Juan Water District); Zlotnick, Greg (San Juan Water Distict)
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Demand Projections
Date:	Tuesday, May 25, 2021 12:10:41 PM
Attachments:	SJWD_General Manager ldy.pdf image001.png

Hi Paul and Greg –

Please see the attached letter as part of the Urban Water Management Plan requirements informing SJWD of our projected water use.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	DLessard@usbr.gov
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Demand Projections
Date:	Tuesday, May 25, 2021 12:07:37 PM
Attachments:	image001.png USBR_Area Manager ldy.pdf

Hi Drew –

Please see the attached letter as part of the Urban Water Management Plan requirements informing the USBR of our projected water use.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

Appendix B – Public and Agency Outreach

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

S. Audie Foster, General Manager
California American Water
4701 Beloit Drive
Sacramento, CA 95838

RE: City of Roseville 2020 Urban Water Management Plan

Dear S. Audie Foster:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Hilary Straus, General Manager
Citrus Heights Water District
6230 Sylvan Road
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Straus:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Dominick Casey, City Manager
City of Roseville
311 Vernon Street
Roseville, CA 95678

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Casey:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Jeremy Shepard, Director of Technical Services
Placer County Water Agency
PO Box 6570
Auburn, CA 95604-6570

RE: City of Roseville 2020 Urban Water Management Plan (UWMP)

Dear Mr. Shepard:

We have received your letter dated November 19, 2020 and at this time have no known objection to the proposed summary for the 2020 UWMP. The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Peter Kraatz, Assistant Director
Placer County Public Works Department
3901 County Center Drive, Suite 220
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Kraatz:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Lehigh Chavez, Environmental Coordinator
Placer County Community Development Resource Agency
3901 County Center Drive
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan

Dear Lehigh Chavez:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Regional Water Authority
5620 Birdcage Street, Suite 180
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan

Dear RWA Members:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Paul Helliker, General Manager
San Juan Water District
9935 Auburn-Folsom Road
Granite Bay, CA 95764

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Helliker:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process. Additionally, in accordance with California Water Code Section 10631, as we are a retail water supplier receiving water from your agency, we will provide you with projected water use for the next 20 years (up to the year 2040).

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Ansel Lundberg, Water and Power Contract Specialist
Sacramento Municipal Utility District
6201 S Street
Sacramento, CA 95817

RE: City of Roseville 2020 Urban Water Management Plan

Dear Ansel Lundberg:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Daniel York, General Manager
Sacramento Suburban Water District
3701 Marconi Avenue, Suite 100
Sacramento, CA 95821

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. York:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Drew Lessard, Area Manager
Central California Area Office
7794 Folsom Dam Road
Folsom, CA 95630

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Lessard:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process. Additionally, in accordance with California Water Code Section 10631, as we are a retail water supplier receiving water from your agency, we will provide you with projected water use for the next 20 years (up to the year 2040).

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Dominick Casey, City Manager
City of Roseville
311 Vernon Street
Roseville, CA 95678

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. Casey:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

S. Audie Foster, General Manager
California American Water
4701 Beloit Drive
Sacramento, CA 95838

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear S. Audie Foster:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Hilary Straus, General Manager
Citrus Heights Water District
6230 Sylvan Road
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. Straus:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Peter Kraatz, Assistant Director
Placer County Public Works Department
3901 County Center Drive, Suite 220
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. Kraatz:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Lehigh Chavez, Environmental Coordinator
Placer County Community Development Resource Agency
3901 County Center Drive
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Lehigh Chavez:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Regional Water Authority
5620 Birdcage Street, Suite 180
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear RWA Members:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Ansel Lundberg, Water and Power Contract Specialist
Sacramento Municipal Utility District
6201 S Street
Sacramento, CA 95817

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Ansel Lundberg:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Daniel York, General Manager
Sacramento Suburban Water District
3701 Marconi Avenue, Suite 100
Sacramento, CA 95821

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. York:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

From:	Joseph, Trevor
To:	Foster, Stephen (American Water)
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:35:03 PM
Attachments:	Cal Am General Manager ldy.pdf image001.png

Hello Stephen

Please see the attached letter as part of the Urban Water Management Plan requirements informing Cal Am of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	York, Linda
Subject:	FW: City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:41:00 PM
Attachments:	CHWD_General Manager ldy.pdf image001.png

From: Joseph, Trevor
Sent: Tuesday, May 25, 2021 12:37 PM
To: Hilary Straus <hstraus@chwd.org>
Subject: City of Roseville 2020 Urban Water Management Plan Public Hearing

Hello Hilary

Please see the attached letter as part of the Urban Water Management Plan requirements informing CHWD of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747



From:	Joseph, Trevor
To:	pkraatz@placer.ca.gov
Cc:	Bigley, Sean; York, Linda; Hanson, Christina (Placer County)
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:40:09 PM
Attachments:	Placer County Public Works_Assistant Director ldy.pdf image001.png

Hello Peter

Please see the attached letter as part of the Urban Water Management Plan requirements informing Placer County Public Works of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	cdraecs@placer.ca.gov
Cc:	Bigley, Sean; York, Linda; Hanson, Christina (Placer County)
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:43:10 PM
Attachments:	Placer County, Environmental Coordinator ldy.pdf image001.png

Hello Leigh

Please see the attached letter as part of the Urban Water Management Plan requirements informing Placer County Environmental Coordinator of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From: Cecilia Partridge
Subject: City of Roseville 2020 Urban Water Management Plan Public Hearing Notification
Date: Tuesday, May 25, 2021 2:54:37 PM
Attachments: RWA_Membership Idy.pdf

EXTERNAL: This email originated from outside of the organization. Do not click on any links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon RWA members,

Attached is a notice from the City of Roseville regarding an upcoming Public Hearing for their 2020 Urban Water Management Plan.

Any questions please feel free to contact me.

Cecilia Partridge
cpartridge@rwah2o.org
Executive Assistant
Regional Water Authority
5620 Birdcage Street, Suite 180
Citrus Heights, CA 95610
916-213-4631 cell

From:	Joseph, Trevor
To:	"Ansel Lundberg"
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:46:14 PM
Attachments:	SMUD_Water and Power Contract Specialist Idy.pdf image001.png

Hello Ansel

Please see the attached letter as part of the Urban Water Management Plan requirements informing SMUD of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	Dan York
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:45:17 PM
Attachments:	SSWD_General Manager ldy.pdf image001.png

Hello Dan

Please see the attached letter as part of the Urban Water Management Plan requirements informing Sacramento Suburban Water District of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

York, Linda

Subject: FW: Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050
Attachments: NOTICE OF PUBLIC HEARING UWMP AND WSCP.docx

From: Rachel White <rachelw@goldcountrymedia.com> on behalf of legals@goldcountrymedia.com <legals@goldcountrymedia.com>
Sent: Friday, May 21, 2021 4:01:49 PM
To: Six, Katrina <KMSix@roseville.ca.us>
Subject: RE: Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050

EXTERNAL: This email originated from outside of the organization. Do not click on any links or open attachments unless you recognize the sender and know the content is safe.

Hi, Katrina,

This order has been completed and scheduled as requested for The Roseville Press Tribune on May 28, June 4, 2021. The order is #77551.

If you have any questions on this order, please include the order number in your email to legals@goldcountrymedia.com.

Thank you for your business,

Rachel White
Legals Clerk
Gold Country Media
Direct: (916) 774-7911
Email: legals@goldcountrymedia.com

From: Six, Katrina via Legals [mailto:legals@goldcountrymedia.com]
Sent: Wednesday, May 19, 2021 12:28 PM
To: legals@goldcountrymedia.com
Subject: Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050

Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050

Katrina Six
Deputy City Clerk
City Clerk Department
o: (916) 774-5267
f: (916) 786-9175

Civic Center | 311 Vernon Street | Roseville, CA | 95678



NOTICE OF PUBLIC HEARING
2020 URBAN WATER MANAGEMENT PLAN
AND 2020 WATER SHORTAGE CONTINGENCY UPDATE
CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA

NOTICE IS HEREBY GIVEN that the City of Roseville will hold a public hearing on Wednesday, June 16, 2021 at 6:00 p.m. in the City Council Chambers at 311 Vernon Street, Roseville, California, to consider adoption of the City of Roseville 2020 Urban Water Management Plan. The public hearing will also include consideration for adoption of the 2020 Water Shortage Contingency Plan. The Water Shortage Contingency Plan is included as Chapter 8 of the 2020 Urban Water Management Plan.

The Public Review Draft of these documents is available on the City's website at http://roseville.ca.us/UWMP .

Appendix C – Land Use Element

CITY OF ROSEVILLE CALIFORNIA

II. LAND USE



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LAND USE

PURPOSE

The purpose of the Land Use Element is to set guidelines for managing land use change. Land use designations define allowable density and land uses. The Land Use Map illustrates the location of each of these uses. Goals and policies in this Element guide land use change to achieve many goals: maintaining and enhancing quality of life in neighborhoods; promoting revitalization and economic development; enhancing fiscal sustainability; and ensuring orderly and efficient long-term growth.

A community's ultimate land use distribution and development pattern are influenced by economic development and opportunities, the capacity and location of infrastructure and services, natural and environmental constraints, the periods of time when the community was founded and experienced growth, market opportunities and constraints, and social factors. The implementation of land policies interacts with these and other factors to improve social, economic, and environmental outcomes. Land

use patterns have complex relationships with other key planning considerations. For example, infrastructure capacity and placement can influence the distribution of land uses and the community's overall character. At the same time, the desired community character speaks to the distribution of land uses and the infrastructure necessary to serve these land uses.

It is the overall goal of the Land Use Element to promote a balanced land use pattern that supports innovative land use approaches and retains and enhances the distinct character and identity of Roseville.

GUIDING PRINCIPLES

The City has received input from residents and business owners through surveys, task forces, committee meetings, and other mechanisms. This input was used to develop guiding principles that create the foundation for the goals and policies of the Land Use Element. These guiding principles include:

- Promote and enhance Roseville's unique character and identity.
- Distinguish Roseville from adjacent communities through the quality of development and design and the level of public services and facilities provided.
- Protect and enhance Downtown and the City's established neighborhoods.
- Promote new development and ensure that development is an integrated and connected part of the City's land use pattern.
- Provide a variety of housing types and opportunities to serve the needs and incomes of all households.
- Create a balanced land use pattern with an appropriate mix of uses to accommodate residential, employment, service, and social needs within the community.
- Preserve open space in areas with sensitive environmental resources and provide high-quality, accessible recreational amenities.
- Ensure fiscal responsibility.
- Create a land use mix and development pattern that accommodates and promotes alternative transportation modes for ease of access and improved air quality and public health.
- Proactively manage and plan for growth.

ORGANIZATION

The Land Use Element consists of the Land Use Map and land use goals and policies. The Land Use Map visually illustrates the City's existing and planned land use mix and pattern.[1] Land use decision-making is guided by the goals and policies contained in the text of the Land Use Element, as well as the land use implementation measures outlined in the appendix to the General Plan. While the Land Use Map is an illustration of policy, it only reflects those policies that can be graphically shown. The Land Use Map and land use policies must be used in combination with each other, along with the policies from the other Elements.

[1] A copy of the Land Use Map is available through the Development Services Department - Planning Division at 311 Vernon Street or online at www.roseville.ca.us.

The Land Use Element is organized into the following six components:

1 ***Planning Area*** provides a description of the Planning Area, the Sphere of Influence, and planning subareas.

2 ***Land Use Designations*** identifies and defines the City's land use categories, incorporating general use, development, intensity, and siting and compatibility guidelines.

3 ***Development Forecast*** presents estimates of future development potential within the Planning Area.

4 ***Community Form*** provides goals and policies to define and direct the future form and development pattern of the City.

5 ***Community Design*** includes goals and policies that address aesthetics, integration of the built and natural environments, and community character.

6 ***Growth Management*** focuses on the proactive management of growth in the community, including performance standards to regulate growth and development, as well as policies addressing annexations and expansion of the City's Sphere of Influence.



It is the overall goal of the Land Use Element to promote a balanced land use pattern that supports innovative land use approaches and retains and enhances the distinct character and identity of Roseville.

PLANNING AREA

The focus of the General Plan's land use policy is on the City's "Planning Area" (see Figure II-1), which includes all planning subareas within the City limits, Sphere of Influence, and the City/County Memorandum of Understanding area, as described below.

Sphere of Influence

The City's Planning Area includes 796 acres of land that is within the City's Sphere of Influence, but outside the current City limits. The City does not have jurisdiction over projects proposed within the Sphere of Influence, but will monitor, receive notices, and provide official comments on such projects. The City will use policies of the Growth Management component of this Element to evaluate annexations to the City and expansions of the Sphere of Influence, which would be subject to approval by the Placer County Local Agency Formation Commission (LAFCO).

City/County Memorandum of Understanding Area

The City has an expanded cooperation agreement in place with Placer County, commonly referred to as the City/County Memorandum of Understanding (MOU), which provides guidelines for the City or County to follow to ensure that development within the MOU area is cooperatively planned with input from both agencies.

Planning Subareas

Within the City limits, there are 16 subareas that have been defined for planning purposes. These include the Infill Area, the North Industrial Area, and the City's 14 Specific Plan Areas:

- **Infill Area** – This area has vacant and underutilized properties where the City will encourage infill development, but overall, it is mostly built out. The Infill Area includes the historic core of the community but excludes the Downtown and Riverside Gateway Specific Plan Areas.

- **North Industrial Area** – While not subject to a specific plan, this is a recognized planning subarea of the City that provides a major opportunity for industrial and employment development serving the south Placer region. The North Industrial Area has adopted design guidelines, the North Roseville Design Guidelines, which applies to the majority of the planning area. Other portions of the North Industrial Area are regulated by the Hewlett Packard Master Plan or Campus Oaks Master Plan.

- **Southeast Roseville Specific Plan (1985)** – This mixed-use Specific Plan represents the City's first effort to use the specific plan process to master plan a new development area.

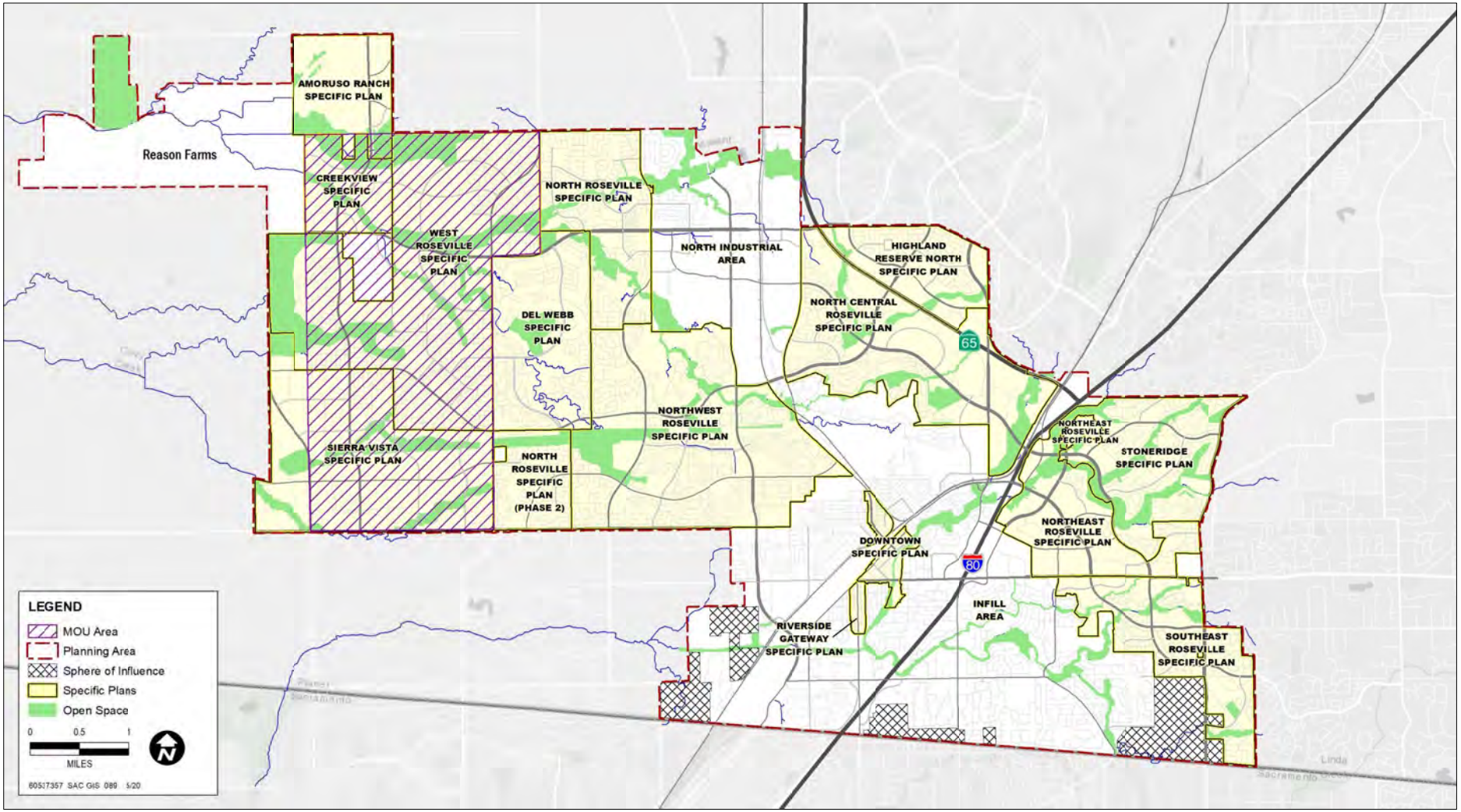
- **Northeast Roseville Specific Plan (1987)** – This Specific Plan is primarily intended for commercial and employment-generating uses but also has significant residential and open space components.

- **Northwest Roseville Specific Plan Area (1989)** – The predominant land uses in this Specific Plan Area are single- and multi-family development, but the Specific Plan also provides for commercial, office, open space, and public uses.

- **North Central Roseville Specific Plan (1990)** – This Specific Plan Area includes residential, commercial, and office uses, along with a large area for wetland preservation and creation.

- **Del Webb Specific Plan (1993)** – This Specific Plan Area is planned as an age-restricted community consisting of single-family homes focused around recreational facilities with supportive private and public uses.

Figure II-1 | Planning Areas



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- **Highland Reserve North Specific Plan (1997)** – This Specific Plan accommodates single- and multi-family residential development, along with commercial and other supportive uses.
- **North Roseville Specific Plan (1997)** – This multi-phase Specific Plan includes single- and multi-family dwelling units, commercial uses, parks and other public facilities, and open space.
- **Stoneridge Specific Plan (1998)** – This Specific Plan accommodates single- and multi-family residential development, commercial and office uses, parks and other public facilities, and open space.
- **West Roseville Specific Plan (2004)** – This Specific Plan accommodates single- and multi-family dwelling units, including age-restricted units, commercial uses, industrial development, parks and other public facilities, and open space.
- **Riverside Gateway Specific Plan (2006)** – The Riverside Gateway Specific Plan is intended to guide public improvements and facilitate commercial and residential infill development between Douglas Boulevard and Darling Way.
- **Downtown Specific Plan (2009)** – This Specific Plan encourages mixed-use infill development throughout the Historic Old Town and the Vernon Street District. The associated Downtown Code implements the Plan, physically applying the Plan's guidance to properties within the Plan Area.
- **Sierra Vista Specific Plan (2010)** – This Specific Plan accommodates single- and multi-family units, including age-restricted units, commercial development, parks and other public facilities, and open space.
- **Creekview Specific Plan (2012)** – This Specific Plan accommodates single- and multi-family dwelling units, commercial and office development, parks and other public facilities, and open space.
- **Amoruso Ranch Specific Plan (2016)** – This Specific Plan accommodates single- and multi-family dwelling units, commercial development, parks and other public facilities, and open space.

Roseville's Specific Plans play an important role in guiding development and conservation. In many areas of the City, the Specific Plans are the primary mechanism for implementing the goals and policies of the General Plan. It is the City's policy to plan for new development and/or reinvestment efforts through the Specific Plan process.

The Specific Plans establish detailed policies and implementation programs for portions of the City, consistent with the goals and policies established in the General Plan. Specific Plan land use designations are reflected on the General Plan Land Use Map, although Specific Plans may also use new land use categories that are more specific or tailored to a particular situation. The City's Specific Plans are consistent with, and are hereby incorporated by this reference, as a component of the Land Use Element of the General Plan. Copies of all of the City's Specific Plans may be obtained through the Development Services Department in the Civic Center at 311 Vernon Street or online at: www.roseville.ca.us.

LAND USE DESIGNATIONS

The City's land use designations define allowable land use, and serve as a guide for zoning, Specific Plans, and other land use regulations. Each land use designation has density and intensity guidelines (Table II-3 and II-4), which are used for planning of facilities (e.g. roadway, utilities, schools, parks, etc.) that support the various land uses, as directed by goals and policies in other Elements. The Land Use Map (Figure II-2) illustrates the location of the City's land use designations. The City's land use designations include:

Residential

- Low-Density Residential (0.5 – 6.9 Dwelling Units/Acre)
- Medium-Density Residential (7.0 – 12.9 Dwelling Units/Acre)
- High-Density Residential (13.0 Dwelling Units/Acre or greater)

Commercial

- Neighborhood Commercial
- Community Commercial
- Regional Commercial

Office

- Business Professional

Industrial

- Light Industrial
- Tech/Business Park
- General Industrial
- Transfer Station

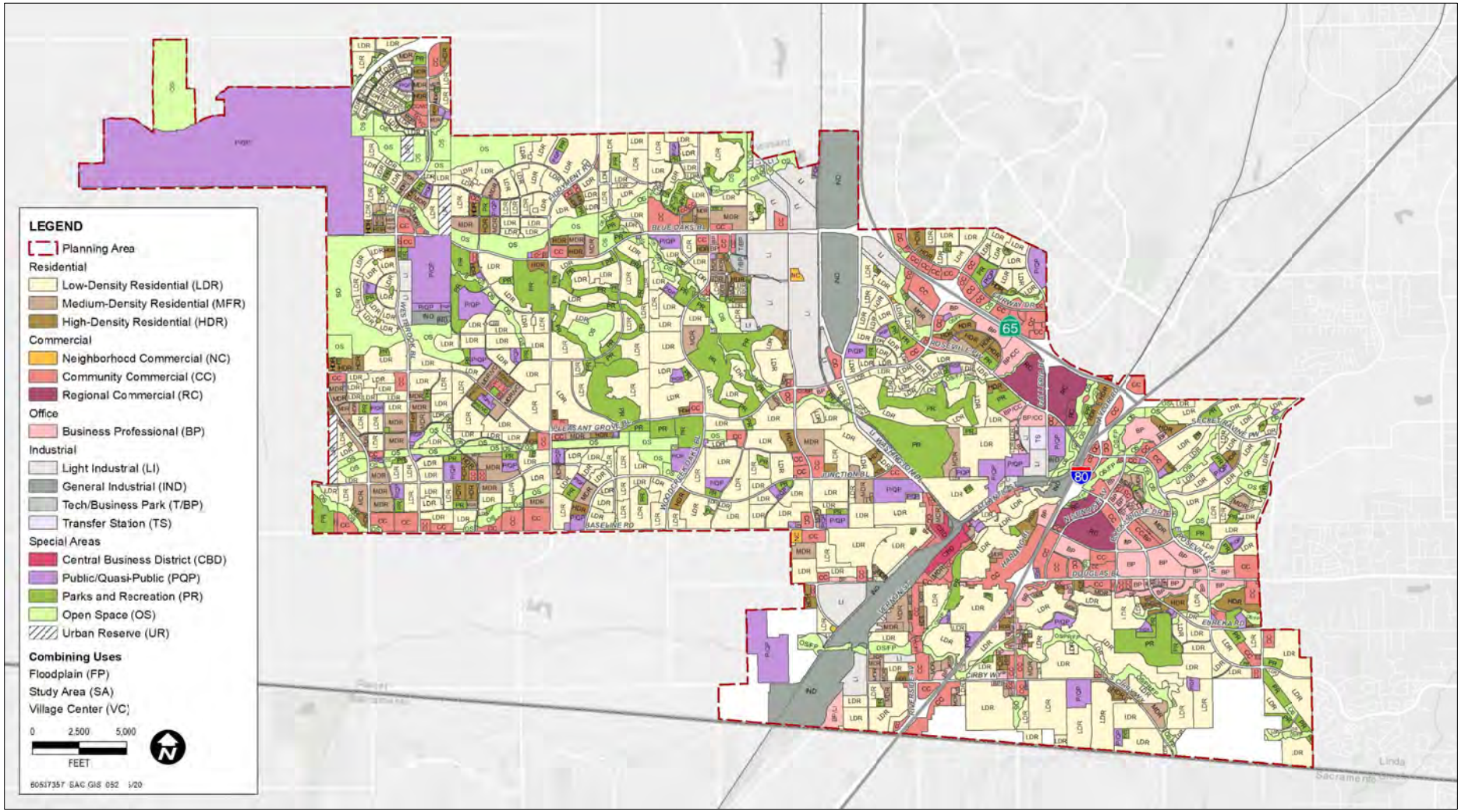
Special Areas

- Central Business District
- Public/Quasi-Public
- Parks and Recreation
- Open Space
- Urban Reserve

Combining Designations

- Floodplain
- Study Area
- Village Center

Figure II-2 | Land Use Map



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Compared to zoning, the City's land use designations define allowable land use broadly, in part to provide the flexibility necessary to achieve the General Plan's policies related to pedestrian orientation and convenience and facilitate mixed-use, infill development. For example, in addition to primary uses, there are permitted secondary uses associated with each land use designation that allow for a more diverse land use mix. The Zoning Ordinance, Specific Plans, and Community Design Guidelines provide more specific standards to ensure compatibility among adjacent land uses. The extent of the secondary uses permitted and conditions related to their use will be as specified in the overlying zoning, Specific Plan, and/or other master plan.

Typically, a single land use designation is applied to a given area. However, to promote mixed-use development, the City may use two or more designations for certain areas that include complementary land uses. Because the Land Use Map provides a guide for future development, it is possible that more than one zoning district may be consistent with any one land use designation.



The City's land use designations define allowable land use broadly, in part to provide the flexibility necessary to achieve the General Plan's policies related to pedestrian orientation and convenience and facilitate mixed-use, infill development.

Use Types, Density, Intensity, and Compatibility

Land use designations contain development guidelines to be applied to each use. These include density guidelines for residential uses, intensity guidelines for non-residential uses, and, where appropriate, land use compatibility guidelines. Tables II-1 and II-2 summarize density and intensity guidelines. Tables II-3 through II-8 describe the purpose, allowable uses, and development guidelines for land use designations. Table II-9 is a compatibility matrix for all land use designations. Table II-10 illustrates the relationship between land use designations and implementing zoning districts.

Table II-1 | Residential Land Use Characteristics

Land Use Category	Dwelling Units Per Acre	Estimated Population Per Gross Acre[1]
Low-Density Residential	0.5 TO 6.9	1.45-20.01
Medium-Density Residential	7.0 TO 12.9	20.3-37.41
High-Density Residential	13.0 +	27.3+

[1] Assumes 2.1 persons per multi-family unit and 2.9 persons per single-family unit based on the American Community Survey (2013 - 2017). The estimated population per gross acre is only an estimate and does not represent City policy.

Table II-2 | Non-Residential Land Use Characteristics

Land Use Category	Floor Area Ratio*	Typical Acreage	Typical Square Footage
Neighborhood Commercial	20% TO 40%	Less than 5	< 50,000
Community Commercial	20% TO 40%	5 to 25	50,000 TO 250,000
Regional Commercial	20% TO 40%	>25	>250,000
Business Professional	20% TO 40%	Varies	Varies
Light Industrial	20% TO 50%	Varies	Varies
Tech/Business Park	20% TO 50%	Varies	Varies
General Industrial	20% TO 50%	Varies	Varies
Transfer Station	Varies	Varies	Varies
Central Business District	Up to 300%	Varies	Varies
Public/Quasi-Public	Varies	Varies	Varies

* Floor Area Ratios (FARs) are intended as guidelines and not as absolute restriction

RESIDENTIAL LAND USES

The residential designations include areas designated for a broad array of housing types with different densities. Each residential designation includes a purpose statement, primary and secondary uses, and development guidelines for each designation.

The Low-, Medium-, and High-Density land use designations are based on the number of allowable dwelling units per gross developable acre. A gross developable acre is defined as the land designated as residential use excluding overhead power lines and their easements, areas within the designated 100-year floodplain, and for the Low- and Medium-Density land use designations, any right-of-way and landscape corridors associated with collector and arterial roadways.

Each residential land use designation is indicated on the Land Use Map as an abbreviation (e.g., LDR) and will be followed by a number, indicating the number of dwelling units per gross developable area (e.g., LDR-6.0). Roseville generally uses the Specific Plan or master planning process to establish land use designations. Minimum and maximum densities for each residential land use designation are included within the development guidelines listed for each designation.

Each residential designation includes both primary and secondary land uses. As expected, the primary land uses are residential in each of these designations, but also include public parks, resource preservation and open space areas, and landscape corridors and other public utility easements. Secondary uses include those uses such as schools, places of worship, private recreation, limited office, and childcare facilities – uses that are normally associated with residential areas and are of such a limited size that a separate or distinct land use designation (e.g., public facility or commercial) is not always warranted.

Table II-3 outlines the purpose, allowable uses, and development guidelines for the residential land designations.

NON-RESIDENTIAL LAND USES

The non-residential designations include areas designated for commercial, office, industrial uses, special areas, and combining districts. Like the residential designations, each non-residential designation includes a purpose statement, primary and secondary uses, and development guidelines for each designation.

Intensity development guidelines for non-residential development are expressed as floor area ratios (FARs). This is a ratio of the total floor area (including all floors and not just the "footprint" of a building) divided by the total lot or parcel area. The City expresses this ratio as a percentage. Typical commercial FARs range from 20 to 50 percent, but may be as high as 300 percent (i.e. a three-story building covering 100 percent of the lot area) in locations such as downtown Roseville.

Intensity and compatibility guidelines for the commercial, office, and industrial land use designations are guidelines and not absolute restrictions. Factors such as General Plan policies, intensity of use, anticipated traffic levels, and availability of public facilities and infrastructure will be assessed as part of the development review or Specific Plan process to determine the appropriate level of floor area to land area ratio.

Unlike the specific secondary uses listed in the residential designations, which are intended to be subordinate and may be permitted only to support neighborhood convenience, the relationship of secondary uses in non-residential areas differ. It is the intention of the non-residential land use designations to permit secondary land uses that support and complement primary uses. These secondary land uses do not need to be subordinate. The size of these areas would typically be limited and would, therefore, not warrant a separate land use designation for the secondary land use. Tables II-4, II-5, and II-6 outline the purpose, allowable uses, and development guidelines for the non-residential land designations.

SPECIAL LAND USE DESIGNATIONS

In addition to the residential, commercial, office, and industrial land use designations, the City has also established Special Land Use Designations for Central Business Districts, Parks and Recreation, Open Space, public uses, and Urban Reserve Areas. Table II-7 outlines the purpose, allowable uses, and development guidelines for the Special Land Use Designations.

COMBINING DESIGNATIONS

These designations are only applied in combination with another land use designation and modify the uses and development guidelines of that designation. Table II-8 outlines the purpose, allowable uses, and development guidelines for the Special Land Use Designations.

Table II-3 | Residential Land Use Designations

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Low-Density Residential (LDR)	Applies to lands where single-family dwelling units, which comprise the majority of Roseville's housing supply, are located. Assigned to lands with the flexibility to accommodate development constraints (e.g., slopes, trees, etc.). Typically, low-density residential lands should require minimal grading or disturbance of natural features. Avoidance of land use limitations (topography, vegetation, easements, etc.) can be achieved by designing larger or smaller lots or by clustering and attaching units.	Attached and detached single-family residences, public parks, resource preservation and open space areas, landscape corridors, and other public utility easements.	Secondary uses include accessory dwelling units, public and private schools, religious assembly, private recreation, and limited office, commercial childcare facilities, and neighborhood retail and services.	0.5 to 6.9 dwelling units per gross developable acre. Lot sizes average 6,000 to 7,500 square feet but may be larger or smaller.
Medium-Density Residential (MDR)	Applies to lands characterized by small-lot single-family detached dwelling units and attached patio homes, halfplexes, duplexes, townhouses, condominiums, and mobile home parks. Should accommodate a variety of housing types and designs. Often located as a transition between higher-intensity land uses and low-density residential uses.	Attached and detached single-family, halfplexes, duplexes and multi-family residences; and public parks, resource preservation and open space areas, landscape corridors and other public utility easements.	Secondary uses include accessory dwelling units, public and private schools, religious assembly, private recreation, and limited office, commercial childcare facilities, and neighborhood retail and services.	7.0 to 12.9 dwelling units per gross developable acre.
High-Density Residential (HDR)	Provides for apartments or condominiums with multiple-story structures containing multiple attached dwelling units. The broad range of densities in this category will yield a variety of design options. May be combined with commercial uses to form a mixed-use development where higher densities could be desirable and beneficial.	Multiple-family dwellings in attached units and public parks, resource preservation and open space areas, landscape corridors, and other public utility easements.	Secondary uses include public and private schools, religious assembly, private recreation, and limited office, commercial childcare facilities, and neighborhood retail and services.	13.0 and above dwelling units per gross developable acre. Should be applied to lands adjacent to bicycle and transit corridors, and in close proximity to services.

Table II-4 | Non-Residential Land Use Designations: Commercial

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Neighborhood Commercial (NC)	Provides basic commercial retail and services for the convenience of surrounding neighborhoods within walking distance of major residential areas.	A limited range of goods and services intended for the convenience of the residents in the immediate neighborhood and compatible with adjacent land uses.	Medical offices, veterinary clinics, other professional offices and commercial child care facilities.	Goods and services may be provided in stand-alone buildings or in small centers, typically on parcels less than five (5) acres in size with a floor area ratio between 20% and 40%. Developments will have a pedestrian scale and orientation and provide convenient pedestrian and bicycle access to reduce the need for an automobile trip. Should be adjacent to collector and/or arterial streets, and residential neighborhoods.
Community Commercial (CC)	Provides a broader range of goods and services to an expanded service area.	Retail stores and businesses selling a full range of goods and services including auto sales and repair, and commercial child care facilities.	Professional offices uses, including medical offices and clinics.	Due to the larger service area, the acreages are larger than in the neighborhood commercial land use category. Typically, the acreages range from 5 to 25 acres, the square footage ranges from 50,000 to 250,000 square feet, and the floor area ratio ranges from 20% to 40%. Should be located at intersections of, or adjacent to arterials.
Regional Commercial (RC)	Accommodates the larger shopping centers and commercial activities where uses provide goods and services to a citywide and regional service area.	Major department and discount stores, auto malls, hotels and motels, and commercial recreation or entertainment.	Office and financial institutions.	Typically, Regional Commercial developments would encompass more than 25 acres. Should be located adjacent to and with immediate access to major transit linkages, arterials, regional roadways, and highways. Sites should possess good automobile and truck access. Shopping centers in the regional commercial land use would typically exceed 250,000 square feet with a floor area ratio between 20% and 40%.

Table II-5 | Non-Residential Land Use Designations: Office

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Business Professional (BP)	Provides areas for small and large office uses, including uses supportive of offices.	Administrative, professional, government, and medical offices, and research and development (not including any manufacturing or assembly). Hospitals, clinics, and general medical may also be permitted.	Limited service commercial uses (e.g., banks, restaurants, commercial day care centers, travel agencies, florists, etc.) are encouraged where they would minimize the need for vehicle travel for convenience trips but only as secondary uses in proximity to large office parks and complexes. In association with clinics and hospitals, general medical, pharmacies and other medical related retail may be permitted.	Offices developed in stand-alone buildings or in a business park or campus setting. The business professional land use designation may be applied to lands that are adjacent to regional and community commercial designated lands. May also be used as a buffer between residential areas and arterials, community commercial, and light industrial. Floor area ratios should range between 20% and 40%.

Table II-6 | Non-Residential Land Use Designations: Industrial

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Light Industrial (LI)	Applies to lands reserved for office, industrial, and research and development uses that generate very limited noise, vibration, odor, dust, smoke, light, or other pollutants, and are either integrated or compatible with surrounding uses.	Research and development (which may include manufacturing and assembly), electronics assembly, warehousing, intensive commercial uses (e.g., auto body repair, landscaping material sales, retail and wholesale lumberyards), and associated administrative offices.	Limited service commercial uses (e.g., banks, restaurants, commercial day care centers, travel agencies, florist, etc.) are encouraged where they would minimize the need for vehicle travel for convenience trips, but only as secondary uses. Service uses with large space requirements, such as health clubs, religious assembly, dance and gymnastic studios, and off-peak public assembly uses may also be permitted.	Floor area ratios range from 20% to 50%. Should be located adjacent to major roadways with convenient truck access to accommodate the needs of the businesses that require this land use.

Table II-6 | Non-Residential Land Use Designations: Industrial (Cont.)

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Tech/Business Park (T/BP)	A variant of the LI designation and is envisioned as more of a campus type use. The land use designation provides for a mix of uses that are compatible with and act as a transition between the light industrial use types and commercial and residential uses.	Allowed use types include professional offices, light manufacturing, research services, and light wholesale and distribution.	Limited service commercial uses (e.g., banks, restaurants, commercial day care centers, travel agencies, florist, etc.) are encouraged where they would minimize the need for vehicle travel for convenience trips but only as secondary uses. Service uses with large space requirements such as health clubs, religious assembly, dance and gymnastic studios, and off-peak public assembly uses may also be permitted.	Floor area ratios range from 20% to 50%.
General Industrial (IND)	Provides areas for industrial uses that tend to generate noise, vibration, odor, dust, smoke, light, and an aesthetic appearance not compatible with residential and other sensitive receptors. The intent of this category is to provide a place for industrial uses within the City that is properly buffered from other uses.	A wide range of activities, including manufacturing, wholesale distribution, large storage areas and other industrial uses, are permitted.	Incidental retail and service commercial uses associated with large employment areas and industrial parks.	Areas developed under this designation should be located with direct access to a major or minor arterial or both, freeways, or rail lines. Floor area ratios range from 20% to 50%.

Table II-6 | Non-Residential Land Use Designations: Industrial (Cont.)

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Transfer Station (TS)	Reserves and protects industrial areas that may be suitable for a solid waste transfer station.	Intermediate waste handling facilities where solid waste is transferred from hauling vehicles to a transfer vehicle where the waste or portion thereof undergoes processing, recycling, or further handling before transport to a disposal site, waste processing facility, or other facility.	None.	Only be applied where all of the following is satisfied: • All adjacent land use designations are General Industrial or Light Industrial; • All areas within 200 feet of the transfer station facility property shall be zoned such that the transfer station facility use is protected from incompatible adjacent uses; • The area has access from major arterials capable of providing access for transfer vehicles and the public; and • The use of the area as a transfer station facility is consistent with the existing or planned character of the area. Transfer stations shall be designed and maintained to, at a minimum, include enclosed processing areas, paved access, fenced and screened storage areas for recycled goods, dust mitigation, and be in compliance with other City, county, state, and federal standards.

Table II-7 | Special Land Use Designations

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Central Business District (CBD)	Accommodates significantly greater intensities and traditional mixed retail, office, and apartment uses. Limited in its application to Downtown Roseville but may be applied to areas of greater urban intensity.	A mix of retail and office uses, including municipal offices, public assembly, theaters, and restaurants.	Medium-density and high-density residential uses.	Floor area ratios may be as high as 300% (three times the site area).
Park and Recreation (P/R)	Accommodates public parks and public and private recreation facilities.	Public park and recreation facilities, including ball diamonds and fields, golf courses, pools, bike trails and community buildings; and private recreation uses when they include outdoor facilities, such as golf course, tennis courts, and similar uses.	Libraries, child/elder care facilities, resource mitigation, and drainage detention.	For public recreation, the Parks and Recreation Element contains policies and standards that establish locational criteria, acreage requirements, and the types of improvements planned for each of the City parks.
Open Space (OS)	Preserves and protects public and private lands that are significant due to wildlife habitat, natural features, or flood hazard. Within new development areas, the 100-year floodplain will be designated as Open Space. Sensitive or unique natural features, including, but not limited to, wetlands, vernal pools, and oak woodlands are also to be designated as Open Space as part of specific plans and other major development review processes.	Preserved natural lands, passive recreation and minor recreation facilities (picnic tables, restrooms), walking and bike trails, and resource interpretive facilities.	Resource mitigation and drainage detention.	All permitted uses shall be compatible with the preservation and protection of open space values (habitat and visual) and shall comply with the policies and standards contained in the Open Space and Conservation Element.
Public/Quasi-Public (P/QP)	Establishes areas for education, religious assembly, governmental offices, municipal corporation yards, and water treatment plants.	Municipal, governmental or public facilities, places of worship, and related uses.	None.	This land use designation shall apply to all municipal facilities and may also be applied to quasi-public facilities where the size of such facilities warrants an individual land use designation.

Table II-7 | Special Land Use Designations (Cont.)

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Urban Reserve (UR)	Applies to those lands that are anticipated to receive urban land entitlements, but at the present time, are constrained by growth management policies, availability of services or other limitations.	Agriculture, open space, passive recreation and resource protection.	Caretakers' residence.	A caretaker's residence may be established at a density of 1 unit per 300 acres. Prior to the allocation of any urban land use entitlements, the applicable constraints must be resolved, consistent with the policies contained in the Growth Management component of this Element.

Table II-8 | Combining Designations

Designation	Purpose	Permitted Uses and Guidelines
Floodplain (FP)	Identifies lands that are within the regulatory floodplain boundaries as defined in the Safety Element. Development is strictly regulated by the City. In areas with existing development, the floodplain designation is an overlay or a combining land use. As part of a specific plan, the land use designation may be combined with an open space or parks designation, if found consistent with the policies of the Safety Element.	Uses are limited to those that minimize flooding impacts on upstream and downstream areas and are consistent with both the policies of the Safety Element and the underlying land use designation.
Study Area (SA)	Identifies future General Plan or neighborhood study areas. This combining designation may be applied to any area, in which the City believes that additional land use analysis and amendment of the General Plan may be desirable to resolve specific neighborhood or land use issues.	Concurrent with a Land Use Map amendment to apply this combining designation, the City shall also adopt an ordinance regulating interim land use development. Such regulations shall relate to the land use issue that requires such regulations and shall include an expiration date.
Village Center (VC)	Allows for a mix and density of land uses common to a traditional downtown, urban setting. Allows for flexibility and deviation from the development guidelines and permitted uses contained in the primary land use designation for which it is combined.	Use of this combining designation requires comprehensive land use planning through approval of a Specific Plan. The permitted uses, development guidelines, and extent of deviation are to be defined in the Specific Plan.

Table II-9 | Compatibility of Adjacent Land Use Designations as Applied on the General Plan Land Use Map

	LDR	MDR	HDR	NC	CC	RC	BP	LI	IND	T/BP	CBD	P/QP	P/R	OS	UR	VC
LDR	■	■	▒	▒	▒	□	▒	▒	□	□	▒	▒	■	■	▒	▒
MDR	■	■	■	▒	▒	□	▒	▒	□	▒	▒	▒	■	■	▒	▒
HDR	▒	■	■	▒	▒	▒	▒	▒	□	■	■	▒	■	■	▒	▒
NC	▒	▒	▒	■	■	▒	■	■	▒	■	■	■	▒	▒	▒	▒
CC	▒	▒	▒	■	■	■	■	■	▒	■	■	■	▒	▒	▒	▒
RC	□	□	▒	▒	■	■	■	■	▒	■	▒	▒	▒	▒	▒	▒
BP	▒	▒	▒	■	■	■	■	■	▒	■	■	▒	■	■	▒	▒
LI	▒	▒	▒	■	■	■	■	■	■	■	▒	▒	▒	▒	▒	▒
IND	□	□	□	▒	▒	▒	▒	■	■	▒	□	▒	□	▒	▒	▒
T/BP	▒	▒	■	■	■	■	■	■	■	■	■	■	▒	▒	■	□
CBD	▒	▒	■	■	■	▒	■	▒	□	■	■	■	■	■	▒	▒
P/QP	▒	▒	▒	■	■	▒	▒	▒	▒	■	■	▒	■	■	▒	▒
P/R	■	■	■	▒	▒	▒	■	▒	□	■	■	▒	■	■	▒	▒
OS	■	■	■	▒	▒	▒	■	▒	▒	▒	▒	■	▒	■	▒	▒
UR	▒	▒	▒	▒	▒	▒	▒	▒	▒	■	▒	▒	▒	▒	■	■
VC	▒	▒	▒	▒	▒	▒	▒	▒	▒	■	▒	▒	▒	▒	■	■

■ Compatible
▒ Conditionally Compatible
□ Not Compatible

BP = Business Professional
CBD = Central Business District
CC = Community Commercial
HDR = High Density Residential
IND = General Industrial
LDR = Low Density Residential
LI = Light Industrial
MDR = Medium Density Residential
NC = Neighborhood Commercial
OS = Open Space
P/QP = Public/Quasi Public
P/R = Park and Recreation
RC = Regional Commercial
T/BP = Tech/Business Park
UR = Urban Reserve
VC = Village Center

Note: or purposes of this table, “adjacent” includes land uses separated by collectors and local streets but does not include land uses separated by major arterials or highways or by a buffer greater than 50 feet defined as open space, parks, paseos, or landscape setbacks, provided the adjacent use is not heavy industrial or manufacturing.

Table II-10 | Land Use Designations, Special Areas, and Combining Designations and Implementing Zones

LAND USE DESIGNATION	IMPLEMENTING ZONES
Low-Density Residential (LDR)	R1, R2, RS, RMU, PD
Medium-Density Residential (MDR)	R2, R3, RS, RMU, PD
High-Density Residential (HDR)	R3, RM, PD
Neighborhood Commercial (NC)	NC, PD
Community Commercial (CC)	NC, CC, PD, GC, HC, CMU
Regional Commercial (RC)	CC, RC, GC, PD
Business Professional (BP)	BP, PD
Light Industrial (LI)	M1, MP, MMU, PD, CMU
General Industrial (IND)	M1, M2, MMU, MP, PD, CMU
Central Business District (CBD)	HD, CBD, R3, RMU, P/QP, CMU, BP, NC, PR, OS, PD
Public/Quasi-Public (P/QP)	P/QP, PR, OS, UR, PD
Parks and Recreation (P/R)	PR, P/QP, OS, UR
Open Space (OS)	OS, P/QP, PR, UR
Urban Reserve (UR)	OS, P/QP, PD, UR, PR
Tech/Business Park (T/BP)	BP, MMU, CMU, MP, M1
Village Center (VC)	R1, R2, R3, RS, CC, CMU, PD, NC

Note: Land use designation implementation is not necessarily limited to these zones, especially when combined with an RS or PD zone. Additional zones may be consistent for transitional or interim land uses consistent with General Plan policies. Mixed land use designations may require a variety of land use designations, overlay and/or a PD zone.

Implementing Zones Legend
BP = Business Professional; CBD = Central Business District; CC = Community Commercial; CMU = Commercial Mixed Use; GC = General Commercial; HC = Highway Commercial; HD = Old Town Historic District; M1 = Light Industrial; M2 = General Industrial; MMU = Industrial Mixed Use; MP = Industrial/Business Park; NC = Neighborhood Commercial; OS = Open Space; P/QP = Public/Quasi-Public; PD = Planned Development; PR = Park and Recreation; R1 = Single-Family Residential; R2 = Two-Family Residential; R3 = Multi-Family Housing; RC = Regional Commercial; RMU = Residential Mixed Use; RS = Small Lot Residential; UR = Urban Reserve.

DEVELOPMENT FORECAST

The City can influence the pace of development and the number of dwelling units, building square footage, jobs, population, and other characteristics of development through General Plan policy and implementing actions. The pace and nature of buildout of the General Plan is also dependent on factors outside of the City's control, including, but not limited to:

- Global, national, state, and regional economic conditions
- Federal budget and regulatory actions
- State budget allocations, relevant policy direction, and regulatory actions
- Perceptions about the quality of life in the region
- Housing costs, demographic trends, and community character
- Job and educational opportunities
- Infrastructure, resource, and land availability and cost

While it is difficult to accurately predict the amount and pace of long-term development, it is important for long-range plans to provide such estimates. The location, timing, and financing for infrastructure and public facilities depend on these forecasts. They also allow communities to assess land availability for different housing types and inform updates to plans that are needed as demand and capacity for different housing types change over time. Estimates of development capacity also allow the City to assess whether it can accommodate existing and future needs for non-residential development.[2] Development forecasts are used in the City's environmental impact analysis and inform mitigation measures that are needed to reduce or avoid such impacts.

With buildout of the General Plan, the City is estimated to have a total population of approximately 198,000, with approximately 75,200 dwelling units, 60 million square feet of non-residential building square footage, and between 120,000 and 150,000 local jobs (Table II-11).

The estimates of future population, housing units, local jobs, and square footage of development are not City policy. These assumptions are derived strictly for the purposes of analysis. The General Plan does not specify a maximum growth rate. Certain areas designated for urban use may or may not be developed between the present and 2035. Some areas may be developed at the upper end of the density ranges, while other areas may develop at the lower end. It is likely that, over time, the underlying factors driving these development forecasts will change. The City may update land use change assumptions from time to time, either in the context of a General Plan amendment or update, or as a separate exercise for planning purposes.

The City may also update the General Plan, Specific Plans, or implementing documents for policy purposes based, in part, on development forecasts and changes to these development forecasts in the future. For example, the Land Use Element contains policies that are intended to promote a beneficial jobs/housing balance. The right balance is related to the number of residents that commute, the transportation mode used for that commute, and the commute distance and time required. The relationship between jobs and housing affects and is affected by local employment opportunities, household incomes, housing prices, and non-residential lease rates and land costs. The City could

[2] This includes an assessment of the capacity for both "basic" and "non-basic" activities and services. While there is some overlap, in general, basic activities serve an export market, and are the driver of economic growth, while non-basic activities serve the local market.

consider plan amendments to the General Plan or Specific Plans to ensure an adequate supply of land for housing and economic development purposes.

Table II-11 | Existing and Future Development

Development Factor	2016	2035
Dwelling Units	52,900	75,200
Population	135,800	198,000
Non-Residential Square Footage	33,000,000	60,000,000
Jobs	82,000	120,000 to 150,000
Jobs to Dwelling Units	1.55	1.6 to 2

Notes: The population estimate assumes 2.1 persons per multi-family unit and 2.9 persons per single-family unit based on the American Community Survey (2013 - 2017), 1.8 persons per household for age-restricted dwelling units based on the 2010 Census, and 350 square feet for each resident for congregate care/assisted living facilities. The 2016 jobs estimate is from the Sacramento Area Council of Governments (SACOG) 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy Appendix C – Land Use Forecast. The future non-residential square footage was estimated by the City of Roseville in 2019 and does not include square footage devoted to fairgrounds, schools, or structures within golf courses, parks, or cemeteries. The estimate for local jobs in 2035 is derived using existing jobs-to-housing, jobs-to-population, and employment per square footage ratios applied to 2035 estimates for dwelling units, population, and non-residential square footage.

Achieving the City's planning objectives requires more than the right ratio between housing and local jobs. This is not just a mathematical exercise, but rather, requires both a quantitative and qualitative analysis of commute behavior, employment opportunities by occupation and wage, housing need and income type, and the rate of both job and housing growth in a regional context. Similarly, while the relationship between jobs and housing is important to monitor, Roseville also strives to be a complete community with neighborhoods and districts that offer a diverse array of housing, commercial and public services, recreational and cultural opportunities, and multiple transportation options to reach daily destinations.

COMMUNITY FORM

The Community Form component is intended to go a step beyond the identification of land uses and the rules and regulations for their development. Goals and policies related to community form address the physical characteristics that lend shape, appearance, and identity to a community. A community's character is tied to expressions of familiar physical characteristics - landmarks, streets, buildings, parks, and natural features that create a unique identity. Roseville's policies are intended to influence the shape, form, and appearance of both new development and reinvestment in existing districts and neighborhoods, so that development appropriately reflects the vision and goals of residents and decision makers.

Community form has been the focus of regional long-range planning efforts, particularly since the adoption of the Sacramento Region Blueprint by the Sacramento Area Council of Governments (SACOG) Board of Directors in 2004. The Blueprint Principles focus on high-quality design for compact development that provides walkable communities; compact development that helps preserve open space, allow multi-modal transportation access, and facilitate more efficient infrastructure provision; reinvestment to allow better use of existing infrastructure; mixed-use development that provides for more vibrant neighborhoods; and open space that is incorporated into development and conserved on the fringes of the developed region for agriculture and habitat. These Blueprint Principles are broad and are expected to be applied differently in different parts of the Sacramento region. In 2005, the City went through a process to identify how these Principles, including the following Roseville Blueprint Implementation Strategies, which are embodied in the Community Form and Community Design components of this Element, should be applied locally.[3]

- **Transportation Choices:** Provide a variety of transportation choices. Development should be designed to encourage people to walk, ride bicycles, ride the bus, ride transit and heavy rail, or carpool. Land use concepts are intended to encourage the use of these modes of travel and reduce congestion.

- **Mixed Land Use:** Provide a variety of services in proximity to residential uses to reduce the reliance on automobile travel and give residents transit options… A mix of land uses can be provided within the same building and/or project. There are many examples of this type of development: housing near employment centers; a building with ground-floor retail with housing such as apartments or condominiums above; etc.

- **Compact Development:** Take advantage of compact building design. Creating environments that are more compactly built and that use space in an efficient but aesthetic manner can encourage more walking, biking, and public transit use, and shorten auto trips.

- **Housing Choices:** Create a range of housing opportunities and choices. Providing a variety of places where people can live such as apartments, condominiums, townhouses, and single-family detached homes on varying lot sizes is important in serving all aspects of the community including families, singles, seniors, and people with special needs. This issue is of special concern for residents with very low-, low-, and moderate-incomes (often our teachers, entry-level public safety personnel, and other public employees and professionals) as well as retail employees, service workers, and others for whom finding housing close to work is challenging, especially as land values increase. By providing a mix of housing options, residents will have more choices.

- **Use Existing Assets:** Use of existing assets to strengthen and direct development toward existing development areas. Ongoing public and private investment in the Downtown and historic core is critical to maintaining and enhancing the economic vitality of Roseville. Development of infill or vacant lands, intensification of underutilized parcels, or redevelopment can make better use of existing public

[3] Please see *Smart Choices for Roseville's Future: Implementation Strategies to Achieve Blueprint Project Objectives* (May 2005) for more details.

infrastructure. This can include rehabilitation and reuse of buildings, introduction of mixed-use opportunities, and joint use of existing public facilities, such as parking garages.

- **Natural Resource Conservation:** Natural resource conservation of open space and agricultural land. Encourage the incorporation of public-use open space (such as parks, town squares, trails, greenbelts, paseos, and preserves) within development projects and protect wildlife and plant habitat through open space preservation, agricultural preservation, and promotion of environment-friendly practices, such as energy efficient design, water conservation, and stormwater management. In addition to conserving resources and protecting species, natural resource conservation improves the overall quality of life by providing places for everyone to enjoy the outdoors with family outings and by creating a sense of open space throughout the community.

- **Quality Design:** Foster distinctive, attractive communities with a strong sense of place and use land efficiently. The design details of any land use development, such as the relationship to the street, setbacks, placement of garages, sidewalks, landscaping, the aesthetics of building design, and the design of the public right-of-way (sidewalks, connected streets and paths, bike lanes, and the width of streets), are all factors that can influence the attractiveness of living in a compact development. Design also facilitates the ease of walking and biking to work or neighborhood services. Good site and architectural design are important factors in creating a sense of community and a sense of place.

The Community Form component addresses the following topics:

- ***General*** policies that identify the desired quality of design and public services, along with the connectedness of all neighborhoods and commercial districts of the City.

- ***Development Patterns, Transportation, and Air Quality/Greenhouse Gas Emissions*** provide guidance for land use patterns that allow residents a range of viable transportation options, including walking, bicycling, transit, and vehicular travel.

- ***Downtown and Neighborhoods*** indicates the City's priority in retaining, enhancing, and preserving its historic business district and existing neighborhoods and the development of new areas that provide neighborhood services.

- ***Relationship of New Development*** emphasizes the importance of ensuring that the forms of new development cohere with those of the existing community, and that all portions of the City are linked and compatible with one another.

- ***Jobs/Housing and Economic Development*** establishes policies that support the fiscal viability of the City, focusing on jobs and housing for residents and a prosperous business climate.

- ***Community Involvement and Inter-jurisdictional Cooperation*** addresses the need for community and regional involvement on major development applications, City studies, and regional issues such as air quality, solid waste and transportation. Community involvement will be broad and inclusive and continue to engage the Roseville Coalition of Neighborhood Associations.

GOALS AND POLICIES

COMMUNITY FORM: GENERAL

Goal LU1 **Define Roseville's overall identity and character by the following attributes:**

a. Distinction from other communities through the quality of development and the high level of services provided to citizens.

b. **A commitment to preserving its small-town attributes and cultural heritage and a dedication to promoting a strong sense of community, while preserving individual neighborhoods and promoting a prosperous business community.**

c. **Continuing to be a family-oriented community that offers opportunities to pursue various lifestyles.**

d. **Residential development that includes clusters of high to low densities balanced with large expanses of open space.**

e. **Ensuring high standards of public safety.**

Policy LU1.1 *Ensure high-quality development in new and existing development areas, as defined through specific plans, the development review process, and the Community Design Guidelines.*

Policy LU1.2 *Through both public and private efforts, develop clearly defined entries at major entrances into the City through the use of open space, landscaping, signage, and other distinctive elements as a way of defining the City's boundaries and identity.*

Policy LU1.3 *Continue to provide a full range of public services and maintain high levels of service for public facilities, services, transportation, open space, and parks and recreation.*

Policy LU1.4 *Promote a diversity of residential living options (e.g. density ranges, housing types, affordability ranges), while ensuring community compatibility and well-designed residential development.*

Policy LU1.5 *Promote land use patterns that result in the efficient use of urban lands and preservation of open space, as specified in the Open Space and Conservation Element.*

Policy LU1.6 *Through development approvals and City programs (e.g., revitalization, Capital Improvement Program, parks and recreation programs, etc.), ensure that all portions of the community are linked and integrated.*

Policy LU1.7 *Promote land use patterns that result in the dispersion of secondary or satellite services including libraries, schools, parks, public meeting places, and commercial uses throughout the community through the establishment of neighborhood centers.*

COMMUNITY FORM: DEVELOPMENT PATTERNS, TRANSPORTATION, AND AIR QUALITY/GREENHOUSE GAS EMISSIONS

Goal LU2 **Achieve a community form that supports convenient and safe pedestrian, bicycle, and transit access.**

Policy LU2.1 *Promote development patterns that support a variety of transportation modes and accommodate pedestrian mobility.*

Policy LU2.2 *Allow mixed-use development that integrates residential and non-residential land uses, so that residents may easily walk or bike to shopping, services, employment, and leisure activities.*

Policy LU2.3 *Concentrate higher-intensity uses and appropriate support uses in Pedestrian Districts and within close proximity of transit and bikeway corridors, as identified in the Transit Master Plans and Bicycle Master Plan. Public uses, such as parks, plazas, public buildings, community centers, schools, and/or libraries, should be easily accessible to the public.*

Policy LU2.4 *Promote and encourage the location of employee services, such as child care, restaurants, banking facilities, convenience markets, and other daily needs within major employment centers for the purpose of reducing mid-day vehicle trips.*

Policy LU2.5 *Where feasible, improve existing developed areas to create better pedestrian, bicycle, and transit accessibility.*

Policy LU2.6 *Require proposed neighborhood-serving uses (e.g. neighborhood commercial uses, day care, parks, schools, and other community facilities and services) to be physically linked with adjacent residential neighborhoods through multi-modal transportation connections.*

COMMUNITY FORM: DOWNTOWN AND REVITALIZATION

Goal LU3.1 In partnership with private interests, the City of Roseville will continue to promote a vibrant town center offering government services, social and cultural activities, and commercial opportunities in Downtown Roseville. Roseville will also encourage the creation of additional social, cultural and commercial satellite opportunities throughout the community.

Goal LU3.2 Through the designation of special study areas and revitalization efforts, the City of Roseville will preserve, revitalize, and enhance its business districts, existing neighborhoods, and mixed-use corridors.

Policy LU3.1 *Create and maintain a strong and identifiable Downtown that offers the surrounding community a cluster of municipal offices and services, commercial, retail, and office uses, higher education opportunities, and higher-density residential uses, consistent with the Downtown Specific Plan.*

Policy LU3.2 *Facilitate population and economic growth in areas having the potential for revitalization*

Policy LU3.3 *Direct resources to facilitate revitalization of Downtown, neighborhoods in the Infill Area, and mixed-use corridors.*

Policy LU3.4 *Encourage infill development and reinvestment that:*

- *Upgrades the quality and enhances the character of existing areas;*
- *Enhances the mix of land uses in proximity to one another so that more households can access services, recreation, and jobs without the use of a car;*
- *Facilitates pedestrian activity and public transit use;*
- *Efficiently utilizes and does not overburden existing services and infrastructure; and*

- *Results in land use patterns and densities that provide the opportunity for the construction of a variety of housing types that are affordable to all income groups.*

Policy LU3.5 *Promote active citizen involvement in defining, maintaining, and improving the character and identity of existing neighborhoods, including consideration of cultural and artistic enhancements.*

Policy LU3.6 *Support the maintenance and rehabilitation of existing residential units within established neighborhoods.*

Policy LU3.7 *Identify locations where special study is necessary to develop strategies for preserving, enhancing, and revitalizing existing developed areas.*

COMMUNITY FORM: NEW DEVELOPMENT

Goal LU4 Design new development to be integrated, connected, and related to existing development areas within the City.

Policy LU4.1 *Require new development areas and associated community-wide facilities (open space resources, parks, libraries, etc.) to be linked and oriented to existing developed areas of the community through road networks, public transit systems, open space systems, bikeway and pedestrian systems, and other physical connections.*

Policy LU4.2 *Encourage a development pattern that is contiguous with existing developed areas of the City.*

COMMUNITY FORM: JOBS/HOUSING AND ECONOMIC DEVELOPMENT

Goal LU5.1 Roseville will strive to be a complete community with a mix of land uses, housing types, and job opportunities that meet the diverse needs of its existing and future residents and businesses.

Goal LU5.2 Roseville will promote and encourage the availability of a variety of goods and services and retain a positive business climate in the City.

Policy LU5.1 *Implement a land use mix and pattern of development that provides linkages between residents' jobs and local employment-generating uses, facilitates a match between the number and type of local jobs and the local labor force, and maintains the fiscal viability of the City.*

Policy LU5.2 *Support density bonuses in the construction of affordable housing, in accordance with the Density Bonus Ordinance and the Housing Element, to promote affordable housing options in areas particularly in areas where with few such housing opportunities and where employment centers exist or are planned.*

Policy LU5.3 *Consider the fiscal impacts to the City from projects proposing a General Plan land use change.*

Policy LU5.4 *The City may approve a project that is identified as having a negative fiscal impact on the City if overriding findings are made that the project benefits outweigh its impacts. Such benefits may relate to the provision of affordable housing, significant open space or recreation facilities, job creation, infill development near transit service, or other public benefits.*

Policy LU5.5 *Uphold the City's Affordable Housing Goal by requiring an affordable housing target for projects seeking a General Plan Amendment, Specific Plan Amendment, and/or rezoning to a residential designation proposing 25 or more new dwelling units. For these projects, the target is for a minimum of 10% of all new housing units to cost no more than 30% of the total monthly income of very low-, low-income, and moderate-income households (the City also uses the term "middle" in certain Specific Plans to refer to moderate-income households earning no more than 100% of the Area Median Income- AMI). The breakdown of the affordable units will be, at a minimum, 40% for rental to very low- and 40% for rental to low-income households. The remaining 20% may be reserved for moderate-income purchase (which will be priced to be affordable to households earning 95% of the Area Median Income) or may be distributed equally among the rental obligations, as approved by the City. Variations in affordable housing ratios may be approved through a Development Agreement where the following criteria are met:*

- *A need has been identified for a specific affordable housing type (very low-, low- or moderate-income) and the project meets this need;*
- *The project does not rely on or obtain City subsidies; and*
- *Units proposed within these criteria would allow for individuals to stay within their units as their future income grows.*

Policy LU5.6 *Maintain land use patterns, intensities, and densities that ensure an adequate supply of land for office, commercial, industrial, and other employment-generating development.*

Policy LU5.7 *Support activities that attract employment uses to the City, as identified in the Economic Development Strategy.*

COMMUNITY FORM: COMMUNITY INVOLVEMENT AND INTER-JURISDICTIONAL COOPERATION

Goal LU6.1 Roseville recognizes its role within the Sacramento and Placer County region and is dedicated to exploring regional solutions to regional issues.

Goal LU6.2 Provide inclusive community engagement opportunities for individuals and community groups to produce timely and meaningful input leading to proactive, consensus-driven actions by the City and its partners.

Policy LU6.1 *Encourage active involvement by individuals and citizens in the planning process through ongoing public participation opportunities and informational programs.*

Policy LU6.2 *For major development proposals (e.g. major General Plan amendments, adoption of specific plans and amendments), encourage and provide public participation opportunities at early stages in the process.*

Policy LU6.3 *Coordinate and take a lead role, where feasible, with local, state, federal, and other agencies on regional issues of importance, including but not limited to air quality, climate change mitigation and resiliency, transportation, water supply, sewage treatment, solid waste disposal and recycling, flood control, hazardous waste management, resource protection, and transit.*

Policy LU6.4 *To the extent feasible, coordinate land use planning and public improvements with neighboring jurisdictions.*

Policy LU6.5 *Encourage early consultation with adjacent jurisdictions and refer development proposals that may have an impact to these jurisdictions to the respective agencies for their review and comment. Respond and comment on development proposals in other jurisdictions that may have an impact on Roseville to minimize such impacts and ensure consistency and compatibility with existing and planned development in the City.*

COMMUNITY DESIGN

Design influences the aesthetics, character, desirability, and function of a community. Roseville, through its development review process, promotes high-quality design that balances aesthetic and functional considerations; integrates the natural and built environments; and creates inviting, convenient, safe, and comfortable human-scale connections between different land uses.

The emphasis of the Community Design component of this Element is on presenting a design framework that reflects the City's goal of high-quality, community-wide design. To assist in achieving this goal, the City has developed policies that address aesthetics and function, the integration of the built and the natural environments, art in public places, and community character. The application of these design principles will help to establish an aesthetically pleasing city and a distinct community identity.

The goals and policies in this Element will be implemented through the application of the City's Community Design Guidelines. The Guidelines provide detailed standards that establish common design elements and concepts to be used in the design and review of new development proposals in Roseville. The intent of the Guidelines is to ensure consistent quality, while supporting flexibility and the ability to provide unique solutions that fulfill the intent of the Guidelines through alternative means. The City anticipates that the Community Design Guidelines will need to be updated periodically to implement the General Plan's direction in a dynamic regulatory and economic environment. The design concepts contained in this Element, and further refined by the Community Design Guidelines, indicate Roseville's desire to create a City that has a distinct character notable for its high-quality design.

GOALS AND POLICIES

COMMUNITY DESIGN

Goal LU7.1 **Achieve a consistent level of high-quality aesthetic and functional design through the development of, and adherence to superior design concepts and principles, as defined in the Community Design Guidelines.**

Goal LU7.2 **Encourage, promote, and support the maintenance and expansion of a wide range of programs that serve to increase public understanding, appreciation, and enjoyment of cultural and artistic forms, and the display of artistic expression in public spaces to contribute to the cultural experience and the sense of place and community.**

Goal LU7.3 **Encourage the planning and building of a city that sensitively integrates open space and natural resources, and promotes compatibility within and between the natural and the urban environments.**

Goal LU7.4 Emphasize the preservation and enhancement of historically and culturally significant buildings, native oak trees, woodlands, and other significant features, as a primary element in defining Roseville's community character.

Policy LU7.1 *Through the design review process, apply design standards that promote the use of high-quality building materials, architectural and site designs, landscaping signage, and amenities.*

Policy LU7.2 *Continue to develop and apply design standards that result in efficient site and building designs, pedestrian-friendly projects that stimulate the use of alternative modes of transportation, and compatibility between adjacent developments.*

Policy LU7.3 *Encourage designs that strike a balance between the incorporation of aesthetic and development requirements, and the economic considerations associated with development.*

Policy LU7.4 *Promote flexibility in the design review process to achieve design objectives, and encourage projects with innovative, unique, and creative architectural style and design.*

Policy LU7.5 *Encourage, promote, and support art in public spaces and programs to enhance the design of the City.*

Policy LU7.6 *Encourage project designs that place a high priority and value on open space, and the preservation, enhancement and incorporation of natural resources and other features including consideration of topography, vegetation, wetlands, and water courses.*

Policy LU7.7 *Encourage and promote the preservation of historic and/or unique, culturally and architecturally significant buildings, features, and important visual resources.*

Policy LU7.8. *The location and preservation of native oak trees and oak woodlands shall be a primary factor in determining site design, building location, grading, construction and landscaping, and in establishing the character of projects through their use as a unifying element in both new and existing development.*

Policy LU7.9 *Control artificial lighting to avoid spill-over lighting onto adjacent properties. Use anti-reflective architectural materials and coatings to prevent glare.*

GROWTH MANAGEMENT

In general, growth management can be defined as certain actions taken by local government to influence the location, composition, rate, or total amount of development in a community. The City manages growth to help coordinate development opportunities and constraints, as dictated by the physical, social, and economic characteristics of the areas planned for development, for the City as a whole.

The City recognizes two primary candidates for growth potential. The first is within existing developed parts of the City's corporate boundaries through reinvestment in the community. The second is either inside or outside City limits through new development of "greenfield" areas (non-urbanized or vacant land). "Greenfield" development has been the focus of the City's growth management efforts, but as the City matures and approaches buildout, infill development and reinvestment have an increasing role in meeting the City's needs for housing and economic development.

Inherent in the term "growth management" is the assumption that there will be growth. With growth, there are many potential tangible and intangible benefits, as well as impacts. The right type of growth can be beneficial to the community's economy and quality of life through additional employment opportunities, housing availability, improved delivery and variety of services, opportunity for greater access to destinations without the use of a car, enhanced efficiency of public service provision and fiscal sustainability, and increased commercial, social and cultural opportunities. At the same time, if growth is not well planned and managed, it can have negative impacts on the community. These may include increased reliance on the automobile for reaching destinations, public health effects related to air pollutant emissions, increased costs of construction and maintenance for public infrastructure, impacts to environmental resources, loss of community character, loss of the sense of safety and security, and other adverse effects.

Growth Management Principles

The challenge is to accommodate and manage growth that balances the positive and negative impacts in a fashion that results in an overall benefit to the community. This is best accomplished proactively. To this end, the overarching principles that guide the City's approach to managing growth include:

- Maintain quality of life through a balance of land uses;
- Maintain the City's fiscal health in the long term;
- Continue to add and enhance the value of the built environment;
- Maintain and further define the City's physical form through creation of an open space transition area along the western interface with County lands.

In the recent past, the City has used the Specific Plan process, with appropriate updates to the General Plan, to manage and direct growth in a way that is relatively more comprehensive, compared to a project-by-project approach. This approach allows the City to plan for and finance necessary infrastructure and facilities, address area-wide development opportunities and constraints, and identify key growth management issues that may not be apparent in the context of individual project analysis.

Growth Management Visioning Committee

In 2004, the City Council appointed a 20-member Growth Management Visioning Committee. The Committee was charged with reviewing growth management policies and developing a vision and policy recommendations to guide the City's long-range physical development. The Committee's Vision includes 11 characteristics that define the preferred future:

- A Distinct Community Identity;
- Well-Planned Neighborhoods and Communities;
- A Vibrant Downtown;
- A Balance Between New Growth and Revitalization;
- Abundant Parks and Open Space;
- A Diverse Range of Housing Types;
- Mobility and Transportation Choices;
- Economic Vitality;
- Convenient Access to Higher Education;
- Sustainable Environmental Resources and Infrastructure;
- Innovative Design and Land Use Planning; and,
- On-going Partnerships with Neighboring Communities.

The Committee recommended three additional policy concepts: Maintain Roseville's Identity and Character; Promote Stakeholder Involvement and Ensure Accountability; and Work Aggressively to Address Traffic Generated Outside of Roseville. Further, the Committee recommended that the following Policy Concepts be used to evaluate and influence potential growth that could affect the City within its current boundaries, within its Sphere of Influence, and in unincorporated land where the development will impact the City:

- Maintain an Open Space Transition Buffer;
- Ensure Fiscal Sustainability;
- Encourage High-Quality Infrastructure, Programs, and Services;
- Promote Comprehensive Large-Scale Planning;
- Use Performance-Based Standards to Manage Growth;
- Ensure Community Benefit;
- Maintain Roseville's Identify and Character;
- Promote Stakeholder Involvement and Ensure Accountability; and,
- Work Aggressively to Address Traffic Impacts Generated Outside of Roseville.

Guiding Principles for Growth

The City Council adopted a set of 13 Guiding Principles for new development areas in May of 2001. The intent of the Guiding Principles is to supplement General Plan policies by creating guidelines for new development proposals for areas located outside of City limits. They are intended to articulate the City's expectations relating to any potential development proposals and are to be applied as performance

measures for annexation proposals. These principles are contained as policies of this Growth Management component.

The Growth Management component focuses on the development of performance standards rather than artificial timelines or growth rates for future development. This approach has resulted in goals and policies that emphasize performance (e.g., maintaining levels of service, providing adequate park acreage, financing needed school facilities, etc.) rather than on specific dates, growth rates, or build-out of existing plans. The performance standards provide the criteria for planning and managing growth by requiring the mitigation of growth impacts and the provision of both tangible and intangible benefits to the community.

GOALS AND POLICIES

GROWTH MANAGEMENT - GENERAL

Goal LU8.1 **Proactively manage and plan for growth.**

Goal LU8.2 **Encourage a pattern of development that promotes the efficient and timely provision of urban infrastructure and services, and that preserves valuable natural and environmental resources.**

Goal LU8.3 **Growth shall mitigate its impacts through consistency with the General Plan goals and policies and shall provide a positive benefit to the community.**

Goal LU8.4 **Continue a comprehensive, logical planning process, rather than an incremental, piecemeal approach.**

Goal LU8.5 **Encourage public participation in the development and monitoring of growth management policies and programs.**

Goal LU8.6 **Manage and evaluate growth in a regional context, not in isolation.**

Goal LU8.7 **Potential population growth in Roseville must be based on the long-term carrying capacities and limits of the roadway system, sewer and water treatment facilities, and electrical utility service, as defined in the Circulation Element and the Public Facilities Element.**

Goal LU8.8 **Growth and development must occur at a rate corresponding to the availability of desired facilities' capacity.**

Goal LU8.9 **Growth should be managed to minimize negative impacts to existing businesses and residents within the City.**

Goal LU8.12 **Use growth management as a tool to maintain the City's identity, community form, reputation in the region, to maintain high levels of service for residents, and to influence projects outside the City's boundaries that have the potential to affect the quality of life and/or services that are provided to residents.**

Policy LU8.1 *Growth must provide a strong diversified economic base and a balance between employment and affordable housing.*

Policy LU8.2 *Growth should occur on the basis that projected revenue should be sufficient to meet public costs.*

Policy LU8.3 *Growth shall be managed to ensure that adequate public facilities and services, as defined in the Public Facilities Element, are planned and provided, and public health, safety, and welfare is protected.*

Policy LU8.4 *The City shall accommodate projected population and employment growth in areas where the appropriate level of public infrastructure and services are planned or will be made available concurrent with development.*

Policy LU8.5 *The City shall use the specific plan process to ensure a comprehensive, logical growth process for new development areas (e.g., annexations) or any areas where significant land use changes are considered.*

Policy LU8.6 *The City shall oppose urban density residential, commercial, or industrial development in unincorporated areas unless adequate public facilities and services can be provided and mechanisms to ensure their availability and provision are secured during the land use entitlement process. It is the City's preference that urban development occur within incorporated areas.*

Policy LU8.7 *The City will manage growth in such a way to ensure that significant open space areas will be preserved.*

Policy LU8.8 *Retain and enhance Roseville's identity and character to ensure that Roseville, even as it grows, remains consistent with the Growth Management Visioning Committee's Vision Statement.*

Policy LU8.9 *Work aggressively to address traffic generated outside of Roseville by working in collaboration with neighboring jurisdictions, regional, state, and federal entities to ensure that traffic through Roseville is mitigated by regional solutions. The City will encourage changes in land use mix and community design that promote walking, biking, and transit.*

Policy LU8.10 *In addition to being consistent with the other goals and policies of the General Plan, Specific Plans shall comply with the following:*

a. *Provide a public focal point, community, and/or theme feature. These features shall be specific to each area and be designed to promote and enhance community character. A special feature may include, but is not limited to, a community plaza, central park, or some other type of gathering area; outdoor amphitheater; community garden; regional park with special facilities; sports complex; or cultural facilities.*

b. *Provide entryways at entrances to the City in accordance with the Community Design Guidelines. Where possible, the entryways shall take advantage of and incorporate existing natural resources into the entry treatment. The Specific Plans shall identify the location and treatment of the entryways, and shall consider the use of open space, oak regeneration areas, signage, and/or special landscaping to create a visual edge or buffer that provides a strong definition to entryways into the City.*

c. *The Specific Plan areas shall be planned and oriented to be an integral part of the City consistent with the policies of the Community Form component of this Element.*

d. *Develop design guidelines, specifying screening and a transition between public utilities (e.g. substations, pump stations) and other uses, in conjunction with the public utility departments and agencies. In addition, development along power line and*

pipeline easements shall incorporate design treatment to ensure compatibility and safety. Design guidelines and treatment may include minimum setbacks, building and landscape design standards, and possible limitations on certain types of uses and activities.

e. *Preserve natural resource areas where they exist, and where feasible, along new roadways. Such roadways may create a public boundary between the resource area and other uses. The Specific Plans shall identify locations and standards for the preservation of natural resources along roadways, and shall identify sources of financing for such road segments.*

GROWTH MANAGEMENT – NEW GROWTH AREAS

Goal LU9.10 Growth should be planned in a way that addresses the appropriate interface between City and County lands.

Goal LU9.11 New growth should be designed to meet the Guiding Principles for Growth.

Goal LU9.13 New development shall be consistent with the City's desire to establish an edge along the western boundary of the City that fosters: a physical separation from County lands through a system of connected open space; a well-defined sense of entry to City from the west; opportunities for habitat preservation and recreation; and view preservation corridors that provide an aesthetic and recreational resource for residents.

Policy LU9.1 *The City may consider modification to the General Plan for new growth where adequate public services and facilities and preservation and conservation of natural resources can be provided in conjunction with the following:*

a. *Additional land to accommodate demand for housing or employment uses*

b. *Projects that will provide community benefits, including, but not limited to the provision of public transit services*

c. *Ensure that growth provides benefits to the community as a whole and weigh community benefits against public costs*

Policy LU9.2 *Prior to the consideration of any General Plan amendment to modify land use designations or expand the City's boundaries or Sphere of Influence, the City shall complete or cause to be completed the following City-wide studies/plans:*

a. *Long-range transit plan*

b. *Fiscal studies*

c. *Public facilities and services capacity study*

d. *Transportation system capacity study*

e. *Utility capacity and supply (i.e., water, sewer, drainage, and electric)*

The studies shall define overall holding capacities and identify additional performance standards that will need to be met to ensure the achievement of the goals and policies of the General Plan.

Policy LU9.3 *The City shall require the submittal of a specific plan for the consideration of new development areas or any areas where a significant modification to the General Plan land use allocation is proposed. The specific plan process shall, at a minimum, include the following:*

a. *General Plan Amendment*

b. *Development Agreement*

c. *Zoning Entitlements*

d. *Environmental Impact Report*

e. *Phasing, Financing, Capital Improvements Plan*

f. *Fiscal Impact Analysis*

Policy LU9.4 *Specific plans will be evaluated based on the following minimum criteria:*

a. *Government Code requirements for specific plans*

b. *Demonstrated consistency with General Plan goals and policies*

c. *Demonstrated consistency with the identified City-wide studies and holding capacity analyses*

d. *Justification for proposed specific plan boundaries*

e. *Community benefit (e.g., affordable housing, significant open space or recreation facilities, job creation, infill development near transit service).*

f. *Ability to substantially mitigate impacts*

g. *Impact on the City's growth pattern*

Each specific plan proposal shall include, with its initial submittal, a full analysis of how the plan complies with, and relates to the above factors.

Policy LU9.5 *Apply the City's adopted Guiding Principles for Growth to any new development proposed in and out of City's corporate boundaries that is not already part of an adopted Specific Plan or within the Infill Area:*

1. *Any new development proposal shall, on a stand-alone basis, have an overall net neutral or positive fiscal impact on the City's General Fund Services.*

2. *Any new development proposal shall include logical growth/plan boundaries.*

3. *Any new development proposal shall not create a direct or indirect conflict with the ongoing operations of the Pleasant Grove or Dry Creek Wastewater Treatment Plant operations or any City-owned power generation facilities.*

4. *Any new development proposal shall maintain the integrity of existing neighborhoods and create a sense of place in new neighborhoods.*

5. *Any new development proposal shall include a plan to ensure full funding and maintenance of improvements and services at no cost to existing residents (including increased utility rates). A proposal shall not burden, increase the cost of, or diminish the supply or reliability of public services.*

6. *Any new development proposal shall aid in regional transportation solutions and in right-of-way preservation.*

7. *Any new development proposal that does not have a sufficient supply of surface water shall secure additional supplies above what the City currently has available. New development proposals shall also provide the funding necessary to incorporate the new source of supply into the City's water supply portfolio (surface water, groundwater and recycled water); and new development proposals shall include measures to reduce water demand by implementing the use of conservation best management practices, recycled water, and other off-sets.*

8. *Any new development proposal shall consider development potential within the entire City/County Memorandum of Understanding Area in the design and sizing of infrastructure improvements.*

9. *Any new development proposal shall aid in resolution of regional storm water retention.*

10. *Any new development proposal shall incorporate mechanisms to ensure schools, and, if necessary, new schools, are available to serve residents anticipated for new development and that new development does not adversely affect existing schools.*

11. *Any new development proposal shall include a significant interconnected public open space component/conservation plan consistent with the City of Roseville/U.S. Fish and Wildlife Service Memorandum of Understanding.*

12. *Any new development proposal shall include a public participation component to keep the public informed and solicit feedback throughout the specific plan process.*

13. *Any new development proposal shall provide a community benefit to the City and residents.*

Policy LU9.6 *As new development is proposed in or outside the City's Sphere of Influence, project proponents shall provide a transitional area between City and County lands, through a system of managed interconnecting open space or other buffers, such as separation by arterial roadways.*

Policy LU9.7 *Monitor and participate in development proposals and/or General Plan updates in Placer County to ensure that potential impacts to City residents are minimized, with respect to traffic, service levels, and other quality of life matters.*

Policy LU9.8 *New development proposals to the north and west of the City limits shall meet the objectives and terms of the Memorandum of Understanding between the City of Roseville and the County of Placer.*

Policy LU9.9 *Development proposed on the western edge of the City shall provide a distinctive open space transition to create a physical and visual buffer between the City and County that ensures that the identity and uniqueness of the City and County will be maintained.*

Policy LU9.10 *Consistent with the County/City Memorandum of Understanding, the City shall continue to support and endorse the maintenance of the one-mile buffer zone around landfill operations, as set forth in Policy No. 4.G.11 of the Placer County General Plan. The buffer zone should, consistent with relevant performance criteria, be sufficient to maintain the long-term viability of the landfill, while at the same time protecting City residences from nuisances.*

Policy LU9.11 *Promote stakeholder involvement and ensure accountability between property owners, Placer County, and surrounding jurisdictions on defining and shaping the vision for growth to the west and north of the City.*

GROWTH MANAGEMENT - ANNEXATIONS AND SPHERE OF INFLUENCE

Goal LU10 Evaluate Sphere of Influence amendments and annexations that promote efficient use of land and public service provision and advance General Plan goals.

Policy LU10.1 *The City may initiate studies to investigate the potential of (1) annexing areas within its Sphere of Influence; and (2) expanding its Sphere of Influence boundaries. The studies should be focused on those areas that may affect General Plan goals and policies and would be logically served and planned by the City. The studies shall include the identification, availability, and funding of public services, as well as the costs and impacts to the City and other service providers. Issues to be analyzed include, but are not limited to present and planned land uses, water, sewer, electric, library, parks, schools, circulation, and affordable housing. Based on these studies and resident and property owner input, the City may take steps to annex or expand its Sphere of Influence.*

Policy LU10.2 *The City may consider annexations that:*

- *Are contiguous with City boundaries and provide for a logical expansion of the City;*
- *Create clear and reasonable boundaries;*
- *Are beneficial from a fiscal standpoint to the City and its residents;*
- *Are consistent with state law and Placer County Local Agency Formation Commission (LAFCO) standards and criteria;*
- *Ensure the preservation of open space and agriculture lands; and,*
- *Are consistent with the General Plan.*

Policy LU10.3 *The City may consider expanding its Sphere of Influence to incorporate areas that, in the future, should be logically planned and serviced by Roseville. The City shall consider the following factors, as identified by LAFCO, when making determinations involving Sphere of Influence boundaries:*

- *Present and planned land uses in the area;*
- *Present and probable need for public facilities and services in the area;*
- *Present capacity of public facilities and adequacy of public services;*
- *Existence of any social or economic communities of interest in the area; and,*
- *Open space and agricultural lands.*

Appendix D – AWWA Water Loss Audits

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

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Water Audit Report for: City of Roseville (3110008)
Reporting Year: 2019 1/2019 - 12/2019

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	7	28,372.970	acre-ft/yr	7		3.744	acre-ft/yr
Water imported:	5	1,264.500	acre-ft/yr	2			acre-ft/yr
Water exported:	3	1,336.300	acre-ft/yr	1			acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 28,297.426 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	6	26,276.770	acre-ft/yr			
Billed unmetered:	10	132.020	acre-ft/yr			
Unbilled metered:	8	0.080	acre-ft/yr			
Unbilled unmetered:	8	23.320	acre-ft/yr		23.320	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: ? 26,432.190 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 1,865.236 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		70.744	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	4	265.423	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	65.692	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 401.858 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 1,463.378 acre-ft/yr

WATER LOSSES: 1,865.236 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 1,888.636 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	633.4	miles
Number of active AND inactive service connections:	9	45,395	
Service connection density:		72	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	6	83.2	psi

COST DATA

Total annual cost of operating water system:	10	$14,408,821	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$1.30	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$208.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 70 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
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Water Audit Report for: City of Roseville (3110008)
Reporting Year: 2018 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

			Pcnt:	Value:	
Volume from own sources:	7	28,312.300 acre-ft/yr	8	1.810	acre-ft/yr
Water imported:	5	1,106.030 acre-ft/yr	1		acre-ft/yr
Water exported:	3	1,123.700 acre-ft/yr	1		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 28,292.820 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	5	26,007.220 acre-ft/yr			
Billed unmetered:	10	74.700 acre-ft/yr			
Unbilled metered:	8	47.560 acre-ft/yr			
Unbilled unmetered:	8	22.394 acre-ft/yr		22.394	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 26,151.874 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 2,140.946 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		70.732 acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	263.180 acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	65.018 acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 398.930 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 1,742.016 acre-ft/yr

WATER LOSSES: 2,140.946 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 2,210.900 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	627.5	miles
Number of active AND inactive service connections:	9	44,467	
Service connection density:		71	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 6 82.1 psi

COST DATA

Total annual cost of operating water system:	10	$14,859,449	$/Year
Customer retail unit cost (applied to Apparent Losses):	9	$1.17	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	5	$179.67	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 68 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

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Water Audit Report for: City of Roseville (3110008)
Reporting Year: 2017 1/2017 - 12/2017

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

				Pcnt:	Value:	
Volume from own sources:	7	28,449.624	acre-ft/yr	8	-143.610	acre-ft/yr
Water imported:	5	964.400	acre-ft/yr	1		acre-ft/yr
Water exported:	3	1,207.900	acre-ft/yr	1		acre-ft/yr
WATER SUPPLIED:		**28,349.734**	acre-ft/yr			

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	5	25,483.030	acre-ft/yr			
Billed unmetered:	10	159.840	acre-ft/yr			
Unbilled metered:	n/a		acre-ft/yr			
Unbilled unmetered:	8	23.920	acre-ft/yr		23.920	acre-ft/yr
AUTHORIZED CONSUMPTION:		**25,666.790**	acre-ft/yr			

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

2,682.944 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		70.874	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	257.404	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	63.708	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **391.986** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **2,290.957** acre-ft/yr

WATER LOSSES: **2,682.944** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **2,706.864** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	615.0	miles
Number of active AND inactive service connections:	9	43,618	
Service connection density:		71	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	5	83.6	psi

COST DATA

Total annual cost of operating water system:	10	$14,825,646	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$1.18	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$112.40	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

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Reporting Worksheet

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Water Audit Report for: City of Roseville
Reporting Year: 2016 1/2016 - 12/2016

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All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	7	25,813.000	acre-ft/yr	3			acre-ft/yr
Water imported:	3	915.250	acre-ft/yr	1			acre-ft/yr
Water exported:	3	911.700	acre-ft/yr	1			acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 25,816.550 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	5	22,956.000	acre-ft/yr			
Billed unmetered:	9	212.000	acre-ft/yr			
Unbilled metered:	8	296.200	acre-ft/yr			
Unbilled unmetered:	7	21.880	acre-ft/yr		21.880	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: 23,486.080 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 2,330.470 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		64.541	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	234.871	acre-ft/yr	1.00%	acre-ft/yr
Systematic data handling errors:	5	57.390	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 356.802 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 1,973.668 acre-ft/yr

WATER LOSSES: 2,330.470 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 2,648.550 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	600.0	miles
Number of active AND inactive service connections:	8	42,655	
Service connection density:		71	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 6 86.2 psi

COST DATA

Total annual cost of operating water system:	10	$9,313,891	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$1.54	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$109.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

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Water Audit Report for: City of Roseville
Reporting Year: 2015 1/2015 - 12/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

					Pcnt:	Value:	
Volume from own sources:	7	22,991.000	acre-ft/yr				acre-ft/yr
Water imported:	9	853.500	acre-ft/yr				acre-ft/yr
Water exported:	9	781.900	acre-ft/yr				acre-ft/yr
WATER SUPPLIED:		**23,062.600**	acre-ft/yr				

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	7	20,499.000	acre-ft/yr			
Billed unmetered:	9	222.000	acre-ft/yr			
Unbilled metered:	8	182.000	acre-ft/yr			
Unbilled unmetered:	7	32.080	acre-ft/yr	1.25%	32.080	acre-ft/yr
AUTHORIZED CONSUMPTION:		**20,935.080**	acre-ft/yr			

Use buttons to select percentage of water supplied OR value

				Pcnt:	Value:	
WATER LOSSES (Water Supplied - Authorized Consumption)		**2,127.520**	acre-ft/yr			
Apparent Losses						
Unauthorized consumption:		57.657	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	5	208.899	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	51.248	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses:		**317.803**	acre-ft/yr
Real Losses (Current Annual Real Losses or CARL)			
Real Losses = Water Losses - Apparent Losses:		**1,809.717**	acre-ft/yr
WATER LOSSES:		**2,127.520**	acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER:		**2,341.600**	acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	583.0	miles	
Number of active AND inactive service connections:	8	41,832		
Service connection density:		72	conn./mile main	
Are customer meters typically located at the curbstop or property line?		No		
Average length of customer service line:	10	1.5	ft	(length of service line, beyond the property boundary, that is the responsibility of the utility)
Average operating pressure:	8	78.0	psi	

COST DATA

Total annual cost of operating water system:	8	$5,579,612	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$0.72	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	8	$242.69	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 72 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

Appendix E – Proposed Water Loss Standards

Proposed Water Loss Performance Standards

Note: The State Water Board has proposed combined standards for water districts that generally report per other water use efficiency requirements in a combined manner for certain water systems.

Sample combination of standards for water systems reporting in different metrics:

Suppliers with all water systems reporting in gallons per connection per day: Standard in in gallons per connection per day

$$\frac{\text{Standard for system 1} \times \text{Number of connections for system 1} + \text{Standard for system 2} \times \text{Number of connections for system 2}}{\text{Sum total of number of connections for system 1 and system 2}}$$

Suppliers with all water systems reporting in gallons per mile per day: Standard in gallons per mile per day

$$\frac{\text{Standard for system 1} \times \text{Length of mains for system 1} + \text{Standard for system 2} \times \text{Length of mains for system 2}}{\text{Sum total of length of mains for system 1 and system 2}}$$

Suppliers with water systems reporting in a combination of gallons per mile per day and gallons per connection per day:

Standard in gallons per connection per day

$$\frac{\text{Standard for system 1} \times \text{Number of connections for system 1} + \text{Standard for system 2} \times \text{Length of mains for system 2}}{\text{Sum total of number of connections for system 1 and system 2}}$$

Calculated baseline and proposed water loss performance standards

Note: The standards that are combined for certain water districts are in orange text, while the individual system data informing the respective combined standard is in *italics* and grey text in the rows above the standard.

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Adelanto City Of	49.1	N/A	18.5	N/A
Alameda County Water District	21.5	N/A	17.7	N/A
Alco Water Service	15.1	N/A	15.1	N/A
Alhambra City Of	8.6	N/A	8.6	N/A
Amador Water Agency	66.3	N/A	21.0	N/A
American Canyon City Of	30.8	N/A	17.7	N/A
Anaheim City Of	23.5	N/A	19.5	N/A
Anderson City Of	53.4	N/A	16.5	N/A
Antioch City Of	11.9	N/A	11.9	N/A
Apple Valley Ranchos Water Company	23.3	N/A	23.3	N/A
Arcadia City Of	32.1	N/A	18.2	N/A
Arcata City Of	48.7	N/A	20.1	N/A
Arroyo Grande City Of	7.7	N/A	7.7	N/A
Arvin Community Service District	67.9	N/A	14.4	N/A
Atascadero Mutual Water Company	35.9	N/A	35.9	N/A
Atwater City Of	308.8	N/A	11.4	N/A
Azusa Lightand Water	78.5	N/A	13.8	N/A
Bakersfield City Of	19.3	N/A	19.3	N/A
Bakman Water Company	85.3	N/A	15.1	N/A
Banning City Of	63.1	N/A	31.4	N/A
Bear Valley Community Services District	N/A	191.7	N/A	191.7
Beaumont-Cherry Valley Water District	41.0	N/A	20.9	N/A
Bella Vista Water District	N/A	1710.6	N/A	670.4
Bellflower-Somerset Mutual Water Company	12.4	N/A	12.4	N/A
Benicia City Of	46.1	N/A	19.4	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Beverly Hills City Of	30.0	N/A	16.9	N/A
Big Bear Community Services District	12.8	N/A	12.8	N/A
Big Bear Lake City Of	9.5	N/A	9.5	N/A
Blythe City Of	80.3	N/A	15.0	N/A
Brawley City Of	54.8	N/A	12.7	N/A
Brea City Of	15.2	N/A	15.2	N/A
Brentwood City Of	30.5	N/A	14.7	N/A
Buena Park City Of	35.8	N/A	16.4	N/A
Burbank City Of	13.4	N/A	13.4	N/A
Burlingame City Of	19.5	N/A	19.5	N/A
Calaveras County Water District-Ebbetts Pass	*84.8*	*N/A*	*20.9*	*N/A*
Calaveras County Water District-Jenny Lind	*155.9*	*N/A*	*21.3*	*N/A*
Calaveras County Water District	112.6	N/A	21.1	N/A
Calexico City Of	4.2	N/A	4.2	N/A
California American Water Company-Los Angeles Division-Baldwin Hills	*24.6*	*N/A*	*17.5*	*N/A*
California American Water Company-Los Angeles Division-Duarte	*85.9*	*N/A*	*18.5*	*N/A*
California American Water Company-Los Angeles Division-San Marino	*27.4*	*N/A*	*18.1*	*N/A*
California American Water Company-Los Angeles Division	42.3		18.1	
California American Water Company-Monterey District	6.4	N/A	6.4	N/A
California American Water Company-Sacramento District-Antelope	*19.4*	*N/A*	*14.9*	*N/A*
California American Water Company-Sacramento District-Lincoln Oaks	*5.6*	*N/A*	*5.6*	*N/A*

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
California American Water Company-Sacramento District-Parkway	*25.3*	*N/A*	*14.2*	*N/A*
California American Water Company-Sacramento District-Rosemont	*29.4*	*N/A*	*17.8*	*N/A*
California American Water Company-Sacramento District	20.4		13.2	
California American Water Company-San Diego District	25.6	N/A	15.6	N/A
California American Water Company-Ventura District	33.5	N/A	24.5	N/A
California City	N/A	1641.2	N/A	460.4
California Water Service Company Bakersfield-Bakersfield	*74.6*	*N/A*	*17.2*	*N/A*
California Water Service Company Bakersfield-North Garden	*65.7*	*N/A*	*18.5*	*N/A*
California Water Service Company Bakersfield	73.7		17.3	
California Water Service Company Bear Gulch	13.9	N/A	13.9	N/A
California Water Service Company Chico District	28.6	N/A	18.7	N/A
California Water Service Company Dominguez	23.8	N/A	18.4	N/A
California Water Service Company East Los Angeles	4.0	N/A	4.0	N/A
California Water Service Company Hermosa-Redondo	12.4	N/A	12.4	N/A
California Water Service Company Livermore	17.2	N/A	17.2	N/A
California Water Service Company Los Altos-Suburban	24.5	N/A	17.8	N/A
California Water Service Company Marysville	40.6	N/A	15.2	N/A
California Water Service Company Mid Peninsula-San Carlos	*6.2*	*N/A*	*6.2*	*N/A*
California Water Service Company Mid Peninsula-San Mateo	*20.6*	*N/A*	*16.1*	*N/A*
California Water Service Company Mid Peninsula	16.6		13.4	

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
California Water Service Company Oroville	27.4	N/A	18.4	N/A
California Water Service Company Palos Verdes	32.6	N/A	24.0	N/A
California Water Service Company Salinas District	9.2	N/A	9.2	N/A
California Water Service Company Selma	35.1	N/A	14.0	N/A
California Water Service Company South San Francisco	0.6	N/A	0.6	N/A
California Water Service Company Stockton	20.6	N/A	13.5	N/A
California Water Service Company Visalia	10.1	N/A	10.1	N/A
California Water Service Company Westlake	31.7	N/A	24.6	N/A
Camarillo City Of	3.4	N/A	3.4	N/A
Cambria Community Service District	15.5	N/A	15.5	N/A
Camrosa Water District	35.9	N/A	18.8	N/A
Carlsbad Municipal Water District	21.5	N/A	21.5	N/A
Carmichael Water District	36.3	N/A	15.5	N/A
Carpinteria Valley Water District	23.0	N/A	23.0	N/A
Castaic Lake Water Agency Santa Clarita Water Division	47.0	N/A	25.5	N/A
Ceres City Of	14.6	N/A	11.3	N/A
Cerritos City Of	19.9	N/A	19.9	N/A
Chino City Of	37.3	N/A	17.8	N/A
Chino Hills City Of	6.2	N/A	6.2	N/A
Citrus Heights Water District	15.3	N/A	15.3	N/A
Cloverdale City of	30.9	N/A	12.6	N/A
Clovis City Of	7.4	N/A	7.4	N/A
Coachella City Of	31.9	N/A	18.7	N/A
Coachella Valley Water District	43.3	N/A	24.1	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Coalinga City Of	41.0	N/A	20.6	N/A
Coastside County Water District	18.5	N/A	18.5	N/A
Colton City Of	65.5	N/A	16.7	N/A
Contra Costa Water District	21.8	N/A	18.5	N/A
Corcoran City Of	N/A	2415.1	N/A	444.7
Corona City Of	16.1	N/A	16.1	N/A
Covina City Of	30.2	N/A	22.3	N/A
Covina Irrigating Company	37.7	N/A	22.2	N/A
Crescent City	80.2	N/A	21.6	N/A
Crescenta Valley Community Water District	22.4	N/A	22.4	N/A
Crestline Village Water District	4.3	N/A	4.3	N/A
Cucamonga Valley Water District	28.6	N/A	21.2	N/A
Cupertino City Of	25.6	N/A	25.6	N/A
Daly City	12.3	N/A	12.3	N/A
Davis City Of	37.3	N/A	11.1	N/A
Del Oro Water Company	22.0	N/A	22.0	N/A
Delano City Of	56.6	N/A	14.1	N/A
Desert Water Agency	87.1	N/A	21.2	N/A
Diablo Water District	15.5	N/A	15.5	N/A
Dinuba City Of	32.9	N/A	11.6	N/A
Discovery Bay Community Services District	14.0	N/A	14.0	N/A
Downey City Of	27.4	N/A	14.9	N/A
Dublin San Ramon Services District	7.3	N/A	7.3	N/A
East Bay Municipal Utility District	45.6	N/A	21.7	N/A
East Niles Community Services District	47.1	N/A	14.6	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
East Orange County Water District	25.8	N/A	25.8	N/A
East Palo Alto City Of	25.1	N/A	14.2	N/A
East Valley Water District	37.3	N/A	19.8	N/A
Eastern Municipal Water District	28.1	N/A	20.7	N/A
El Centro City Of	128.0	N/A	13.7	N/A
El Dorado Irrigation District	83.2	N/A	42.2	N/A
El Monte City Of	49.9	N/A	13.5	N/A
El Segundo City Of	37.6	N/A	15.4	N/A
El Toro Water District	24.2	N/A	24.2	N/A
Elk Grove Water District	15.9	N/A	15.9	N/A
Elsinore Valley Municipal Water District	20.1	N/A	20.1	N/A
Escondido City Of	22.2	N/A	22.2	N/A
Estero Municipal Improvement District	31.4	N/A	14.1	N/A
Eureka City Of	23.2	N/A	15.0	N/A
Exeter City Of	41.0	N/A	12.6	N/A
Fair Oaks Water District	23.3	N/A	19.6	N/A
Fairfield City Of	73.7	N/A	15.0	N/A
Fallbrook Public Utilities District	62.5	N/A	44.8	N/A
Folsom City Of	133.3	N/A	16.9	N/A
Fortuna City Of	45.4	N/A	26.1	N/A
Fountain Valley City Of	11.9	N/A	11.9	N/A
Fresno City Of	47.7	N/A	13.6	N/A
Fruitridge Vista Water Company	71.4	N/A	10.8	N/A
Fullerton City Of	18.4	N/A	18.4	N/A
Galt City Of	24.4	N/A	11.5	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Garden Grove City Of	22.9	N/A	11.9	N/A
Georgetown Divide Public Utility District	N/A	787.5	N/A	787.5
Gilroy City Of	33.4	N/A	17.0	N/A
Glendale City Of	18.2	N/A	18.2	N/A
Glendora City Of	68.5	N/A	19.8	N/A
Golden State Water Company-Artesia	23.3	N/A	13.3	N/A
Golden State Water Company-Barstow	51.0	N/A	26.0	N/A
Golden State Water Company-Bay Point	24.2	N/A	17.8	N/A
Golden State Water Company-Bell-Bell Gardens	21.7	N/A	13.5	N/A
Golden State Water Company-Claremont	46.9	N/A	23.5	N/A
Golden State Water Company-Cordova	67.3	N/A	12.1	N/A
Golden State Water Company-Culver City	15.2	N/A	15.2	N/A
Golden State Water Company-Florence Graham	25.2	N/A	13.1	N/A
Golden State Water Company-Norwalk	16.3	N/A	13.7	N/A
Golden State Water Company-Orcutt	49.5	N/A	16.7	N/A
Golden State Water Company-Placentia	27.3	N/A	22.5	N/A
Golden State Water Company-San Dimas	16.7	N/A	16.7	N/A
Golden State Water Company-Simi Valley	12.2	N/A	12.2	N/A
Golden State Water Company-South Arcadia	15.2	N/A	15.2	N/A
Golden State Water Company-South San Gabriel	41.7	N/A	13.3	N/A
Golden State Water Company-Southwest	14.7	N/A	14.7	N/A
Golden State Water Company-West Orange	19.5	N/A	19.5	N/A
Goleta Water District	24.3	N/A	24.3	N/A
Great Oaks Water Company Incorporated	22.5	N/A	14.4	N/A
Greenfield City Of	37.3	N/A	13.8	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Groveland Community Services District	14.5	N/A	14.5	N/A
Hawthorne City Of	14.1	N/A	14.1	N/A
Hayward City Of	20.5	N/A	20.5	N/A
Healdsburg City Of	10.4	N/A	10.4	N/A
Helix Water District	18.4	N/A	18.4	N/A
Hemet City Of	5.8	N/A	5.8	N/A
Hesperia Water District	19.2	N/A	19.2	N/A
Hi Desert Water District	23.5	N/A	23.5	N/A
Hillsborough Town Of	26.6	N/A	26.6	N/A
Hollister City Of	30.4	N/A	15.6	N/A
Humboldt Community Services District	59.1	N/A	14.0	N/A
Huntington Beach City Of	14.8	N/A	14.8	N/A
Huntington Park City Of	18.8	N/A	12.4	N/A
Imperial City Of	45.6	N/A	14.8	N/A
Indian Wells Valley Water District	38.7	N/A	16.5	N/A
Indio City Of	30.5	N/A	17.6	N/A
Inglewood City Of	12.6	N/A	12.6	N/A
Irvine Ranch Water District	14.9	N/A	14.9	N/A
Joshua Basin Water District	N/A	507.0	N/A	507.0
Jurupa Community Service District	33.0	N/A	24.8	N/A
Kerman City Of	32.4	N/A	11.2	N/A
Kingsburg City Of	505.3	N/A	12.1	N/A
La Habra City Of	28.0	N/A	20.1	N/A
La Palma City Of	37.2	N/A	15.0	N/A
La Verne City Of	34.2	N/A	18.9	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Laguna Beach County Water District	24.4	N/A	17.5	N/A
Lake Arrowhead Community Services District	20.7	N/A	20.7	N/A
Lake Hemet Municipal Water District	32.2	N/A	19.9	N/A
Lakeside Water District	19.8	N/A	19.8	N/A
Lakewood City Of	12.9	N/A	12.9	N/A
Lamont Public Utility District	79.7	N/A	12.9	N/A
Las Virgenes Municipal Water District	25.1	N/A	25.1	N/A
Lathrop City Of	18.6	N/A	13.3	N/A
Liberty Utilities(Park Water)Corp-Bell Norwalk	*5.8*	*N/A*	*5.8*	*N/A*
Liberty Utilities(Park Water)Corp-Compton Willow	*11.2*	*N/A*	*11.2*	*N/A*
Liberty Utilities(Park Water)Corp-Lynwood	*N/A*	*50.2*	*N/A*	*50.2*
Liberty Utilities (Park Water) Corp			6.5	
Lincoln Avenue Water Company	21.4	N/A	21.4	N/A
Lincoln City Of	35.2	N/A	23.6	N/A
Linda County Water District	88.1	N/A	14.0	N/A
Livermore City Of	27.8	N/A	16.8	N/A
Livingston City Of	67.4	N/A	11.4	N/A
Lodi City Of	10.6	N/A	10.6	N/A
Loma Linda City Of	62.3	N/A	16.8	N/A
Lomita City Of	17.7	N/A	12.8	N/A
Lompoc City Of	15.9	N/A	15.9	N/A
Long Beach City Of	7.0	N/A	7.0	N/A
Los Angeles City Department Of Water And Power	36.9	N/A	33.0	N/A
Los Angeles County Waterworks District29-Malibu&Marina Del Rey	26.7	N/A	26.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Los Angeles County Waterworks District40-Antelope Valley	23.3	N/A	20.5	N/A
Los Banos City Of	83.6	N/A	11.5	N/A
Lynwood City Of	22.3	N/A	12.3	N/A
Madera City Of	3.5	N/A	3.5	N/A
Mammoth Community Water District	26.6	N/A	26.6	N/A
Manhattan Beach City Of	3.6	N/A	3.6	N/A
Manteca City Of	22.3	N/A	12.6	N/A
Marin Municipal Water District	24.5	N/A	24.5	N/A
Marina Coast Water District	30.6	N/A	17.4	N/A
Martinez City Of	57.5	N/A	20.3	N/A
Mc Kinleyville Community Services District	19.5	N/A	15.5	N/A
Menlo Park City Of	59.2	N/A	19.3	N/A
Merced City Of	41.9	N/A	11.4	N/A
Mesa Water District	18.0	N/A	18.0	N/A
Mid-Peninsula Water District	14.8	N/A	14.8	N/A
Millbrae City Of	28.4	N/A	17.8	N/A
Milpitas City Of	35.0	N/A	23.5	N/A
Mission Springs Water District	48.1	N/A	19.2	N/A
Modesto City Of	80.9	N/A	14.7	N/A
Monrovia City Of	17.9	N/A	17.9	N/A
Monte Vista Water District	67.3	N/A	21.1	N/A
Montebello Land And Water Company	38.9	N/A	15.3	N/A
Montecito Water District	33.7	N/A	33.7	N/A
Monterey Park City Of	23.6	N/A	18.4	N/A
Morgan Hill City Of	30.4	N/A	17.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Morro Bay City Of	2.1	N/A	2.1	N/A
Moulton Niguel Water District	24.7	N/A	24.7	N/A
Mountain House Community Services District	44.9	N/A	14.8	N/A
Mountain View City Of	18.9	N/A	16.4	N/A
Myoma Dunes Mutual Water Company	47.6	N/A	19.8	N/A
Napa City Of	24.9	N/A	16.2	N/A
Nevada Irrigation District-E George	*58.7*	*N/A*	*28.4*	*N/A*
Nevada Irrigation District-Lake Wildwood	*13.5*	*N/A*	*13.5*	*N/A*
Nevada Irrigation District-Loma Rica	*28.1*	*N/A*	*28.1*	*N/A*
Nevada Irrigation District	37.8	N/A	24.9	N/A
Newhall County Water District	36.2	N/A	27.5	N/A
Newman Cityof	61.7	N/A	11.0	N/A
Newport Beach City Of	26.2	N/A	18.4	N/A
Nipomo Community Service District	N/A	755.7	N/A	755.7
Norco City Of	29.3	N/A	24.9	N/A
North Coast County Water District	13.0	N/A	13.0	N/A
North Marin Water District	8.5	N/A	8.5	N/A
North Tahoe Public Utilities District	64.5	N/A	26.9	N/A
Norwalk City Of	0.4	N/A	0.4	N/A
Oakdale City Of	34.6	N/A	11.0	N/A
Oceanside City Of	15.8	N/A	15.8	N/A
Oildale Mutual Water Company	12.2	N/A	12.2	N/A
Olivehurst Public Utilities District	*48.2*	*N/A*	*13.8*	*N/A*
Olivehurst Public Utilities District-Plumas Lake	*51.7*	*N/A*	*13.5*	*N/A*
Olivehurst Public Utilities District	49.4	N/A	13.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Olivenhain Municipal Water District	36.2	N/A	36.2	N/A
Ontario City Of	23.0	N/A	23.0	N/A
Orange City Of	31.1	N/A	21.6	N/A
Orangevale Water Company	29.6	N/A	16.4	N/A
Orchard Dale Water District	32.3	N/A	13.7	N/A
Otay Water District	15.9	N/A	15.9	N/A
Oxnard City Of	31.3	N/A	17.0	N/A
Padre Dam Municipal Water District	6.6	N/A	6.6	N/A
Palmdale Water District	44.7	N/A	19.8	N/A
Palo Alto City Of	13.4	N/A	13.4	N/A
Paradise Irrigation District	20.9	N/A	20.9	N/A
Paramount City Of	68.5	N/A	18.9	N/A
Pasadena City Of	31.8	N/A	19.0	N/A
Paso Robles City Of	11.0	N/A	11.0	N/A
Patterson City Of	69.4	N/A	12.6	N/A
Petaluma City Of	23.7	N/A	13.4	N/A
Phelan Pinon Hills Community Services District	N/A	819.7	N/A	819.7
Pico Rivera City Of	10.0	N/A	10.0	N/A
Pico Water District	10.3	N/A	10.3	N/A
Pismo Beach City Of	11.8	N/A	11.8	N/A
Pittsburg City Of	24.9	N/A	15.4	N/A
Placer County Water Agency-Auburn Bowman	*56.9*	*N/A*	*19.9*	*N/A*
Placer County Water Agency-Foothill	*47.0*	*N/A*	*20.2*	*N/A*
Placer County Water Agency	49.5	N/A	20.1	N/A
Pleasanton City Of	49.2	N/A	18.9	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Pomona City Of	25.6	N/A	21.2	N/A
Port Hueneme City Of	8.6	N/A	8.6	N/A
Porterville City Of	47.2	N/A	14.6	N/A
Poway City Of	37.4	N/A	31.8	N/A
Quartz Hill Water District	19.3	N/A	19.3	N/A
Rainbow Municipal Water District	N/A	718.5	N/A	718.5
Ramona Municipal Water District	18.4	N/A	18.4	N/A
Rancho California Water District	41.1	N/A	36.6	N/A
Red Bluff City Of	14.3	N/A	14.3	N/A
Redding City Of	57.1	N/A	23.0	N/A
Redlands City Of	46.8	N/A	24.7	N/A
Redwood City	23.6	N/A	14.5	N/A
Reedley City Of	155.1	N/A	11.9	N/A
Rialto City Of	21.2	N/A	21.2	N/A
Rincon Del Diablo Municipal Water District	31.7	N/A	31.7	N/A
Rio Linda-Elverta Community Water District	37.6	N/A	12.3	N/A
Rio Vista City Of	22.3	N/A	15.0	N/A
Riverbank City Of	19.3	N/A	12.9	N/A
Riverside City Of	54.8	N/A	24.0	N/A
Riverside Highland Water Company	10.5	N/A	10.5	N/A
Rohnert Park City Of	27.0	N/A	13.3	N/A
Rosamond Community Service District	27.2	N/A	22.1	N/A
Roseville City Of	41.0	N/A	22.3	N/A
Rowland Water District	18.6	N/A	18.6	N/A
Rubidoux Community Service District	55.8	N/A	20.5	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Rubio Canyon Land And Water Association	22.4	N/A	18.6	N/A
Sacramento City Of	38.2	N/A	12.0	N/A
Sacramento County Water Agency	54.2	N/A	15.6	N/A
Sacramento Suburban Water District	22.1	N/A	15.1	N/A
San Bernardino City Of	47.6	N/A	21.8	N/A
San Bernardino County Service Area64Spring Valley Lake	69.9	N/A	17.1	N/A
San Bernardino County Service Area70J Oak Hills	N/A	1040.5	N/A	767.2
San Bruno City Of	17.7	N/A	17.7	N/A
San Buenaventura City Of(Ventura)	19.9	N/A	19.9	N/A
San Clemente City Of	36.4	N/A	17.9	N/A
San Diego City Of	31.7	N/A	25.1	N/A
San Dieguito Water District	23.5	N/A	21.0	N/A
San Fernando City Of	28.7	N/A	17.2	N/A
San Francisco Public Utilities Commision	24.9	N/A	18.3	N/A
San Gabriel County Water District	24.5	N/A	18.0	N/A
San Gabriel Valley Water Company	21.2	N/A	18.5	N/A
San Gabriel Valley Water Company Fontana Division	40.4	N/A	21.1	N/A
San Jacinto City Of	39.7	N/A	20.1	N/A
San Jose City Of	38.0	N/A	23.0	N/A
San Jose Water Company	24.0	N/A	18.8	N/A
San Juan Capistrano City Of	13.1	N/A	13.1	N/A
San Juan Water District	77.1	N/A	19.4	N/A
San Lorenzo Valley Water District	49.2	N/A	23.6	N/A
San Luis Obispo City Of	27.3	N/A	17.6	N/A
Santa Ana City Of	13.8	N/A	13.8	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Santa Barbara City Of	27.4	N/A	27.4	N/A
Santa Clara City Of	25.6	N/A	15.4	N/A
Santa Cruz City Of	18.5	N/A	18.5	N/A
Santa Fe Irrigation District	53.2	N/A	22.9	N/A
Santa Fe Springs City Of	31.0	N/A	17.8	N/A
Santa Margarita Water District	16.2	N/A	16.2	N/A
Santa Maria City Of	11.2	N/A	11.2	N/A
Santa Monica City Of	2.2	N/A	2.2	N/A
Santa Paula City Of	10.8	N/A	10.8	N/A
Santa Rosa City Of	16.3	N/A	16.3	N/A
Scotts Valley Water District	19.9	N/A	19.9	N/A
Seal Beach City Of	26.3	N/A	15.4	N/A
Shafter City Of	62.2	N/A	14.8	N/A
Shasta Lake City Of	24.0	N/A	24.0	N/A
Sierra Madre City Of	76.3	N/A	27.2	N/A
Signal Hill City Of	18.6	N/A	18.6	N/A
Soledad City Of	17.6	N/A	10.7	N/A
Sonoma City Of	22.8	N/A	16.6	N/A
Soquel Creek Water District	13.3	N/A	13.3	N/A
South Coast Water District	8.1	N/A	8.1	N/A
South Feather Waterand Power	57.0	N/A	30.4	N/A
South Gate City Of	11.2	N/A	11.2	N/A
South Pasadena City Of	30.1	N/A	18.6	N/A
South Tahoe Public Utility District	71.5	N/A	23.0	N/A
Stockton City Of	35.5	N/A	14.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Suburban Water Systems-San Jose Hills	16.8	N/A	16.8	N/A
Suburban Water Systems-Whittier-La Mirada	22.7	N/A	18.4	N/A
Suisun-Solano Water Authority	47.1	N/A	12.3	N/A
Sunny Slope Water Company	27.2	N/A	16.2	N/A
Sunnyslope Community Water District	14.8	N/A	14.8	N/A
Sunnyvale City Of	20.6	N/A	17.1	N/A
Susanville City Of	59.5	N/A	19.5	N/A
Sweetwater Authority	15.4	N/A	15.4	N/A
Sweetwater Springs Water District	29.4	N/A	19.6	N/A
Tehachapi City Of	46.1	N/A	19.5	N/A
Thousand Oaks City Of	14.1	N/A	14.1	N/A
Torrance City Of	6.7	N/A	6.7	N/A
Trabuco Canyon Water District	20.2	N/A	20.2	N/A
Tracy City Of	39.3	N/A	15.4	N/A
Triunfo Sanitation District-Oak Park Water Service	1.6	N/A	1.6	N/A
Truckee-Donner Public Utilities District	63.1	N/A	23.1	N/A
Tulare City Of	18.8	N/A	11.2	N/A
Tuolumne Utilities District-Sonora Jamestown	*75.7*	*N/A*	*25.6*	*N/A*
Tuolumne Utilities District-Upper Basin	*31.6*	*N/A*	*21.7*	*N/A*
Tuolumne Utilties District	56.1	N/A	23.8	N/A
Turlock City Of	58.0	N/A	13.2	N/A
Tustin City Of	37.4	N/A	11.3	N/A
Twentynine Palms Water District	31.3	N/A	27.0	N/A
Ukiah City Of	38.3	N/A	21.2	N/A
Upland City Of	25.2	N/A	25.2	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Vacaville City Of	28.3	N/A	19.5	N/A
Valencia Water Company	30.2	N/A	26.6	N/A
Vallecitos Water District	35.1	N/A	35.1	N/A
Vallejo City Of	57.9	N/A	14.9	N/A
Valley Center Municipal Water District	N/A	834.6	N/A	834.6
Valley County Water District	12.8	N/A	12.8	N/A
Valley Of The Moon Water District	29.0	N/A	15.2	N/A
Valley Water Company	13.4	N/A	13.4	N/A
Vaughn Water Company	31.2	N/A	12.8	N/A
Ventura County Waterworks District No01-Moorpark	35.5	N/A	21.7	N/A
Ventura County Waterworks District No08-Simi Valley	13.4	N/A	13.4	N/A
Vernon City Of	N/A	5234.6	N/A	630.2
Victorville Water District	53.6	N/A	26.5	N/A
Vista Irrigation District	23.8	N/A	23.8	N/A
Walnut Valley Water District	28.3	N/A	28.3	N/A
Wasco City Of	15.3	N/A	12.4	N/A
Watsonville City Of	20.2	N/A	15.0	N/A
West Kern Water District	N/A	5110.3	N/A	506.2
West Sacramento City Of	236.0	N/A	12.8	N/A
West Valley Water District	62.5	N/A	18.1	N/A
Westborough Water District	8.1	N/A	8.1	N/A
Western Municipal Water District Of Riverside	64.6	N/A	32.5	N/A
Westminster City Of	14.5	N/A	14.5	N/A
Whittier City Of	20.0	N/A	15.1	N/A
Windsor Town Of	28.2	N/A	23.9	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Woodland City Of	25.7	N/A	13.5	N/A
Yorba Linda Water District	40.5	N/A	20.9	N/A
Yreka City Of	68.6	N/A	28.3	N/A
Yuba City	35.8	N/A	13.6	N/A
Yucaipa Valley Water District	46.3	N/A	12.0	N/A

Baseline inputs from water loss audits to draft economic model

Note: The data for water systems that are combined into one standard are identified in *italics.*

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Adelanto City Of	450.3	130.6	8194.3	903.9	73.0
Alameda County Water District	2046.7	920.8	85131.3	606.2	72.8
Alco Water Service	146.2	89.2	8638.3	219.8	67.4
Alhambra City Of	179.5	167.5	18588.0	478.9	60.0
Amador Water Agency	142.2	51.3	1914.0	108.7	70.0
American Canyon City Of	192.7	103.4	5584.0	705.7	68.0
Anaheim City Of	1677.7	799.1	63805.3	643.1	77.0
Anderson City Of	203.1	40.0	3396.0	66.1	70.9
Antioch City Of	431.5	370.7	32401.0	777.2	68.2
Apple Valley Ranchos Water Company	550.3	476.2	21051.0	112.9	93.4
Arcadia City Of	502.4	164.6	13978.7	104.3	77.0
Arcata City Of	349.6	90.6	6414.7	274.2	80.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Arroyo Grande City Of	55.8	88.7	6453.3	1501.9	65.0
Arvin Community Service District	307.9	61.3	4046.3	393.5	60.0
Atascadero Mutual Water Company	430.8	246.0	10700.0	175.0	103.0
Atwater City Of	2592.7	97.6	7495.0	112.4	50.0
Azusa Lightand Water	2068.7	305.2	23526.0	301.8	59.7
Bakersfield City Of	1005.4	569.3	46460.7	176.6	70.0
Bakman Water Company	246.5	73.2	2578.5	318.2	52.5
Banning City Of	760.6	168.2	10756.0	190.8	109.3
Bear Valley Community Services District	38.6	180.0	3602.0	524.0	90.0
Beaumont-Cherry Valley Water District	828.9	376.7	18042.0	462.3	75.0
Bella Vista Water District	463.7	242.0	6328.7	176.3	72.0
Bellflower-Somerset Mutual Water Company	98.4	66.0	7053.0	56.1	56.7
Benicia City Of	504.6	114.6	9763.0	230.9	81.0
Beverly Hills City Of	374.5	171.0	11141.0	1205.8	68.2
Big Bear Community Services District	87.5	82.1	6102.0	377.4	85.0
Big Bear Lake City Of	160.7	165.4	15029.7	257.4	86.3
Blythe City Of	305.8	51.4	3400.0	91.6	62.0
Brawley City Of	459.7	100.0	7487.0	50.9	55.0
Brea City Of	231.7	222.1	13573.0	937.8	75.0
Brentwood City Of	810.2	326.7	23700.7	1130.7	62.2
Buena Park City Of	765.6	236.2	19107.0	619.8	70.0
Burbank City Of	401.2	286.0	26661.0	738.5	115.0
Burlingame City Of	201.0	115.8	9200.7	1745.8	85.0
Calaveras County Water District-Ebbetts Pass	*557.4*	*155.6*	*5869.0*	*238.8*	*70.0*
Calaveras County Water District-Jenny Lind	*656.6*	*103.6*	*3759.0*	*209.4*	*70.0*
Calexico City Of	39.9	55.2	8550.0	244.4	50.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
California American Water Company-Los Angeles Division-Baldwin Hills	*180.3*	*69.8*	*6556.3*	*806.3*	*75.8*
California American Water Company-Los Angeles Division-Duarte	*753.7*	*98.8*	*7832.0*	*315.6*	*76.8*
California American Water Company-Los Angeles Division-San Marino	*462.3*	*181.0*	*15085.3*	*366.8*	*76.2*
California American Water Company-Monterey District	279.8	561.4	39097.7	435.1	89.3
California American Water Company-Sacramento District-Antelope	*228.5*	*95.8*	*10496.5*	*277.0*	*68.0*
California American Water Company-Sacramento District-Lincoln Oaks	*91.3*	*143.5*	*14606.0*	*240.2*	*64.5*
California American Water Company-Sacramento District-Parkway	*423.3*	*167.3*	*14912.0*	*167.0*	*63.0*
California American Water Company-Sacramento District-Rosemont	*550.4*	*187.9*	*16725.0*	*169.9*	*76.3*
California American Water Company-San Diego District	629.0	180.8	21939.7	1810.3	71.8
California American Water Company-Ventura District	776.7	256.5	20706.3	1491.7	95.9
California City	576.9	313.8	4858.0	1387.4	65.0
California Water Service Company Bakersfield-Bakersfield	*5510.4*	*856.8*	*65962.7*	*288.6*	*68.3*
California Water Service Company Bakersfield-North Garden	*505.2*	*122.2*	*6859.7*	*288.6*	*71.0*
California Water Service Company Bear Gulch	300.7	347.2	19263.3	1683.7	81.0
California Water Service Company Chico District	934.9	406.0	29204.3	98.9	76.0
California Water Service Company Dominguez	918.6	389.6	34439.7	1380.6	78.0
California Water Service Company East Los Angeles	121.6	277.8	27131.0	574.2	79.0
California Water Service Company Hermosa-Redondo	377.1	217.7	27242.7	1234.7	68.0
California Water Service Company Livermore	365.2	230.4	18935.7	963.9	66.3

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
California Water Service Company Los Altos-Suburban	527.7	300.8	19236.3	1142.6	71.0
California Water Service Company Marysville	178.7	55.9	3929.3	77.2	63.7
California Water Service Company Mid Peninsula-San Carlos	*70.7*	*115.5*	*10139.0*	*1961.3*	*80.0*
California Water Service Company Mid Peninsula-San Mateo	*611.6*	*259.1*	*26497.7*	*1961.3*	*72.0*
California Water Service Company Oroville	117.6	62.4	3834.7	193.6	72.3
California Water Service Company Palos Verdes	887.3	347.3	24292.3	1404.7	91.7
California Water Service Company Salinas District	257.8	279.2	25083.7	138.2	76.0
California Water Service Company Selma	258.8	91.8	6591.3	115.4	59.4
California Water Service Company South San Francisco	11.0	169.0	17224.3	1608.5	76.0
California Water Service Company Stockton	1043.7	562.1	45194.3	684.0	55.0
California Water Service Company Visalia	500.9	588.9	44466.7	66.9	62.7
California Water Service Company Westlake	253.5	118.3	7141.0	1488.2	90.0
Camarillo City Of	51.8	203.0	13706.0	915.8	76.0
Cambria Community Service District	70.1	66.7	4032.0	583.8	85.0
Camrosa Water District	329.7	211.1	8204.7	898.0	65.0
Carlsbad Municipal Water District	777.3	453.7	32204.7	1214.4	81.0
Carmichael Water District	479.5	154.0	11789.7	257.1	66.0
Carpinteria Valley Water District	116.3	88.4	4504.7	386.7	89.0
Castaic Lake Water Agency Santa Clarita Water Division	1633.9	355.0	31054.3	553.3	100.6
Ceres City Of	202.0	154.0	12360.0	66.3	50.0
Cerritos City Of	349.2	186.4	15638.0	439.5	82.5
Chino City Of	843.9	267.0	20204.7	623.0	73.8
Chino Hills City Of	151.4	280.5	21946.3	913.9	80.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Citrus Heights Water District	346.0	271.0	20232.3	250.4	88.3
Cloverdale Cityof	114.6	32.3	3314.3	218.0	57.8
Clovis City Of	289.5	518.0	34901.7	313.4	63.5
Coachella City Of	297.0	121.6	8319.0	117.4	75.0
Coachella Valley Water District	5049.6	1716.7	104047.7	234.8	83.3
Coalinga City Of	177.5	98.5	3861.7	416.0	70.0
Coastside County Water District	158.2	88.9	7624.7	1486.6	78.1
Colton City Of	748.2	165.9	10202.0	160.6	66.7
Contra Costa Water District	1526.0	818.1	62501.3	215.7	73.0
Corcoran City Of	351.7	130.0	3772.0	198.6	50.0
Corona City Of	795.4	802.6	44012.0	609.8	93.6
Covina City Of	292.7	112.7	8650.3	786.0	88.5
Covina Irrigating Company	365.6	111.0	8647.0	794.0	88.4
Crescent City	397.1	104.2	4420.3	89.3	74.2
Crescenta Valley Community Water District	210.7	170.9	8386.3	687.7	93.4
Crestline Village Water District	24.5	72.8	5076.0	1150.0	99.8
Cucamonga Valley Water District	1562.0	710.0	48694.7	487.7	80.0
Cupertino City Of	122.6	59.9	4279.3	1357.8	104.1
Daly City	319.8	198.0	23122.7	1675.7	70.7
Davis City Of	714.0	192.0	17101.7	248.4	50.0
Del Oro Water Company	118.7	64.8	4820.7	470.5	84.2
Delano City Of	595.0	131.0	9390.0	159.9	59.7
Desert Water Agency	2388.3	416.6	24469.0	235.9	79.9
Diablo Water District	207.2	190.0	11903.3	657.4	70.0
Dinuba City Of	221.5	72.5	6016.3	145.9	51.7
Discovery Bay Community Services District	93.4	48.0	5944.3	150.4	60.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Downey City Of	717.1	276.0	23325.0	366.6	65.0
Dublin San Ramon Services District	195.3	319.0	23724.0	1420.3	80.9
East Bay Municipal Utility District	19584.5	4205.9	383229.0	78.2	82.6
East Niles Community Services District	423.5	127.6	8020.3	475.7	60.0
East Orange County Water District	35.2	23.7	1215.0	620.5	101.0
East Palo Alto City Of	115.3	38.6	4102.0	1786.1	65.0
East Valley Water District	974.7	316.6	23319.7	145.9	80.0
Eastern Municipal Water District	5037.5	2390.4	160146.7	871.1	74.7
El Centro City Of	1419.3	120.0	9899.0	76.5	60.0
El Dorado Irrigation District	3863.1	1185.2	41445.3	92.1	109.3
El Monte City Of	209.1	43.0	3738.3	168.9	60.0
El Segundo City Of	217.0	57.5	5152.0	1318.0	67.5
El Toro Water District	272.5	180.2	10044.3	946.0	86.9
Elk Grove Water District	141.9	102.9	7957.0	186.2	61.3
Elsinore Valley Municipal Water District	1019.4	722.7	45313.3	1048.0	84.0
Escondido City Of	665.1	430.7	26710.3	1288.3	96.1
Estero Municipal Improvement District	263.9	120.6	7512.7	1860.5	58.0
Eureka City Of	261.1	160.9	10028.7	1072.5	61.2
Exeter City Of	153.1	43.0	3331.0	537.6	55.0
Fair Oaks Water District	363.1	181.0	13938.7	234.4	80.0
Fairfield City Of	2549.9	370.7	30901.3	113.4	65.0
Fallbrook Public Utilities District	648.0	271.8	9251.3	1139.7	116.6
Folsom City Of	3155.1	335.2	21138.5	112.1	68.0
Fortuna City Of	231.2	65.4	4544.7	216.8	97.3
Fountain Valley City Of	228.0	217.0	17178.0	605.7	70.0
Fresno City Of	7775.7	1839.8	145578.7	168.5	51.1

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Fruitridge Vista Water Company	386.4	52.0	4830.0	100.6	49.0
Fullerton City Of	656.5	431.3	31894.0	791.6	76.9
Galt City Of	206.6	100.7	7565.0	116.8	50.0
Garden Grove City Of	863.0	440.0	33702.0	656.3	52.0
Georgetown Divide Public Utility District	145.7	165.2	3883.7	93.3	93.0
Gilroy City Of	552.7	209.3	14768.7	626.8	70.0
Glendale City Of	696.4	400.0	34101.0	1212.2	94.3
Glendora City Of	1034.0	225.7	13485.0	383.6	76.0
Golden State Water Company-Artesia	282.4	101.2	10824.7	486.9	61.4
Golden State Water Company-Barstow	527.4	187.3	9232.3	124.0	89.0
Golden State Water Company-Bay Point	138.1	52.1	5105.7	1217.7	77.7
Golden State Water Company-Bell-Bell Gardens	181.3	75.0	7449.7	490.1	61.5
Golden State Water Company-Claremont	595.0	162.8	11328.7	868.6	89.9
Golden State Water Company-Cordova	1144.9	202.7	15185.7	98.4	52.4
Golden State Water Company-Culver City	165.0	109.9	9719.7	1363.8	76.1
Golden State Water Company-Florence Graham	275.7	94.1	9774.7	462.3	60.0
Golden State Water Company-Norwalk	174.0	91.0	9507.3	642.0	62.8
Golden State Water Company-Orcutt	639.7	145.3	11544.0	211.0	70.7
Golden State Water Company-Placentia	400.3	144.3	13075.7	689.2	92.0
Golden State Water Company-San Dimas	302.8	204.7	16219.7	866.5	82.0
Golden State Water Company-Simi Valley	184.7	146.1	13543.0	1289.8	74.6
Golden State Water Company-South Arcadia	127.7	66.3	7493.0	457.8	65.4
Golden State Water Company-South San Gabriel	232.8	40.0	4979.7	364.7	62.8
Golden State Water Company-Southwest	874.7	519.0	52959.0	1119.7	74.3
Golden State Water Company-West Orange	611.0	260.4	27917.3	585.1	79.0
Goleta Water District	457.9	254.7	16842.0	1078.3	83.1

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Great Oaks Water Company Incorporated	537.1	211.4	21345.7	851.5	65.0
Greenfield City Of	155.8	35.3	3729.7	136.0	63.0
Groveland Community Services District	52.9	71.0	3262.0	887.3	110.0
Hawthorne City Of	102.2	60.8	6477.0	1046.2	58.3
Hayward City Of	838.8	387.0	36459.7	1823.2	94.1
Healdsburg City Of	54.6	59.5	4706.0	152.3	65.0
Helix Water District	1208.9	744.5	58661.3	1046.5	90.0
Hemet City Of	60.5	132.3	9304.0	240.9	80.0
Hesperia Water District	576.8	589.0	26813.0	645.6	85.0
Hi Desert Water District	280.1	308.9	10635.7	172.3	82.0
Hillsborough Town Of	127.8	100.1	4294.0	3069.4	85.0
Hollister City Of	223.8	93.5	6572.5	363.5	65.0
Humboldt Community Services District	525.5	105.6	7932.0	684.3	60.0
Huntington Beach City Of	902.1	607.2	54440.0	665.2	63.3
Huntington Park City Of	118.7	59.8	5649.7	791.1	56.0
Imperial City Of	282.5	63.0	5532.0	388.7	65.0
Indian Wells Valley Water District	534.8	263.9	12351.3	85.8	61.7
Indio City Of	790.0	344.7	23130.0	175.4	71.3
Inglewood City Of	223.9	156.0	15869.3	1441.9	85.0
Irvine Ranch Water District	1976.2	1886.1	118025.0	1330.3	84.1
Joshua Basin Water District	148.7	261.8	5831.0	1039.7	84.0
Jurupa Community Service District	1164.4	481.6	31509.3	838.5	92.5
Kerman City Of	134.8	59.6	3711.0	104.0	47.0
Kingsburg City Of	2082.3	61.0	3679.0	63.5	50.0
La Habra City Of	411.3	165.0	13121.0	676.1	82.0
La Palma City Of	183.6	39.4	4408.0	506.9	68.7

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
La Verne City Of	339.2	178.0	8854.5	1021.2	70.0
Laguna Beach County Water District	237.3	135.0	8670.0	984.7	70.0
Lake Arrowhead Community Services District	194.2	127.7	8356.7	501.5	88.0
Lake Hemet Municipal Water District	516.2	250.0	14332.0	991.5	75.7
Lakeside Water District	157.0	127.0	7080.7	1461.0	90.0
Lakewood City Of	290.1	180.0	20137.0	291.3	57.0
Lamont Public Utility District	281.3	28.5	3152.0	81.5	60.0
Las Virgenes Municipal Water District	599.0	402.9	21318.3	1001.2	121.8
Lathrop City Of	136.1	112.6	6524.0	95.0	54.0
Liberty Utilities(Park Water)Corp-Bell Norwalk	*109.8*	*205.2*	*16895.0*	*785.8*	*75.8*
Liberty Utilities(Park Water)Corp-Compton Willow	*87.6*	*148.8*	*6959.0*	*785.8*	*87.5*
Liberty Utilities(Park Water)Corp-Lynwood	*9.1*	*162.3*	*4520.0*	*785.8*	*68.4*
Lincoln Avenue Water Company	107.6	58.0	4483.3	439.3	92.0
Lincoln City Of	724.9	244.3	18384.0	904.3	92.0
Linda County Water District	454.2	61.3	4603.7	93.8	60.0
Livermore City Of	320.1	160.3	10285.3	1166.0	67.9
Livingston City Of	248.6	36.0	3293.3	128.2	51.7
Lodi City Of	277.5	243.0	23262.7	179.8	57.5
Loma Linda City Of	379.1	77.4	5435.3	642.3	69.3
Lomita City Of	85.5	43.2	4323.0	1129.8	58.3
Lompoc City Of	178.8	140.0	10016.7	369.6	110.0
Long Beach City Of	737.3	923.0	93928.3	1014.7	67.0
Los Angeles City Department Of Water And Power	30602.8	7384.8	740490.7	936.3	109.0
Los Angeles County Waterworks District29-Malibu&Marina Del Rey	229.0	218.1	7646.0	1401.8	79.3
Los Angeles County Waterworks District40-Antelope Valley	1498.7	1008.0	57449.4	385.5	71.3

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Los Banos City Of	1137.8	175.0	12149.0	93.8	49.4
Lynwood City Of	227.7	95.0	9097.3	1222.2	56.0
Madera City Of	55.8	204.0	14232.0		54.0
Mammoth Community Water District	111.0	66.0	3730.0	129.2	110.0
Manhattan Beach City Of	55.4	106.1	13631.0	1432.6	65.0
Manteca City Of	553.5	285.5	22156.3	156.2	55.0
Marin Municipal Water District	1726.2	869.9	62958.3	335.5	109.3
Marina Coast Water District	255.9	203.0	7474.3	158.1	60.0
Martinez City Of	653.4	139.1	10139.7	195.8	81.2
Mc Kinleyville Community Services District	137.3	87.8	6300.3	710.4	65.0
Menlo Park City Of	299.7	57.7	4520.3	2069.3	79.3
Merced City Of	1011.8	280.0	21545.0	90.6	50.0
Mesa Water District	501.5	328.4	24919.0	728.2	80.0
Mid-Peninsula Water District	132.6	102.3	7988.3	1583.5	102.0
Millbrae City Of	208.8	76.0	6552.7	1970.6	75.8
Milpitas City Of	646.6	194.7	16511.3	695.3	93.8
Mission Springs Water District	708.1	354.1	13138.0	488.3	65.0
Modesto City Of	6525.6	868.0	72015.0	280.4	60.0
Monrovia City Of	194.2	108.6	9678.7	214.9	99.3
Monte Vista Water District	939.9	201.9	12476.3	878.6	80.8
Montebello Land And Water Company	173.8	46.0	3988.3	558.7	66.9
Montecito Water District	175.2	116.5	4643.7	814.9	111.2
Monterey Park City Of	357.2	134.0	13491.0	50.2	80.0
Morgan Hill City Of	478.9	197.2	14060.7	531.5	72.4
Morro Bay City Of	12.7	73.7	5486.0	2573.6	65.0
Moulton Niguel Water District	1483.5	676.3	53674.0	929.5	98.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Mountain House Community Services District	256.2	57.2	5094.0	228.7	65.3
Mountain View City Of	390.3	185.3	18390.0	641.8	72.7
Myoma Dunes Mutual Water Company	134.8	33.8	2525.5	111.4	80.0
Napa City Of	717.4	360.2	25723.0	488.8	67.3
Nevada Irrigation District-E George	*411.8*	*150.7*	*6261.3*	*74.7*	*90.4*
Nevada Irrigation District-Lake Wildwood	*50.3*	*44.8*	*3327.7*	*79.5*	*84.9*
Nevada Irrigation District-Loma Rica	*164.6*	*118.8*	*5224.7*	*87.6*	*88.3*
Newhall County Water District	156.7	65.9	3866.0	273.7	97.1
Newman Cityof	242.6	28.0	3513.0	124.9	52.3
Newport Beach City Of	782.2	302.2	26638.7	1176.7	78.0
Nipomo Community Service District	156.6	185.0	4685.7	173.0	68.0
Norco City Of	249.4	104.7	7586.0	787.7	95.0
North Coast County Water District	175.5	132.6	12091.0	1739.3	83.0
North Marin Water District	196.9	316.6	20768.7	878.5	62.5
North Tahoe Public Utilities District	236.3	46.0	3270.3	157.6	100.0
Norwalk City Of	2.5	57.6	5371.5	955.0	67.5
Oakdale City Of	314.9	75.0	8114.3	123.4	51.0
Oceanside City Of	787.6	591.0	44425.0	1543.7	72.3
Oildale Mutual Water Company	154.3	148.4	11308.3	132.5	60.0
Olivehurst Public Utilities District	*242.8*	*56.5*	*4498.0*	*214.1*	*60.0*
Olivehurst Public Utilities District-Plumas Lake	*129.7*	*25.1*	*2238.5*	*164.9*	*60.0*
Olivenhain Municipal Water District	916.4	466.2	22617.3	1128.4	115.0
Ontario City Of	912.6	595.3	35480.7	346.3	85.0
Orange City Of	1266.2	462.0	36402.0	780.8	86.8
Orangevale Water Company	188.9	82.5	5705.0	167.5	67.5
Orchard Dale Water District	153.8	43.0	4257.0	603.4	62.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Otay Water District	893.5	733.0	50287.7	1756.0	116.6
Oxnard City Of	1481.3	581.4	42312.0	1112.5	67.0
Padre Dam Municipal Water District	177.1	410.0	24072.7	1871.4	107.7
Palmdale Water District	1373.7	433.0	27439.0	278.6	77.2
Palo Alto City Of	395.3	238.5	26404.0	1810.8	71.0
Paradise Irrigation District	201.9	177.9	8640.5	53.1	91.0
Paramount City Of	567.1	161.7	7391.3	441.0	68.3
Pasadena City Of	1357.3	531.5	38048.3	1041.0	73.4
Paso Robles City Of	137.8	228.8	11174.0	569.4	74.2
Patterson City Of	506.2	49.0	6507.7	78.3	60.0
Petaluma City Of	536.6	245.5	20172.7	1056.9	59.0
Phelan Pinon Hills Community Services District	317.7	346.0	7010.0	647.6	100.4
Pico Rivera City Of	107.6	98.0	9562.5	292.7	70.0
Pico Water District	62.5	68.0	5428.7	339.9	66.0
Pismo Beach City Of	62.9	50.0	4759.7	1550.0	72.9
Pittsburg City Of	527.9	254.3	18891.0	806.3	65.0
Placer County Water Agency-Auburn Bowman	*598.1*	*156.1*	*9390.0*	*265.0*	*76.7*
Placer County Water Agency-Foothill	*1481.7*	*413.4*	*28147.0*	*265.0*	*79.7*
Pleasanton City Of	1220.4	329.0	22126.3	858.9	75.3
Pomona City Of	919.8	488.0	32110.0	986.7	82.2
Port Hueneme City Of	56.6	47.3	5838.7	783.2	45.0
Porterville City Of	862.9	260.8	16326.0	182.0	60.0
Poway City Of	584.1	285.5	13949.0	1482.0	102.7
Quartz Hill Water District	126.2	96.9	5824.3	410.3	73.8
Rainbow Municipal Water District	257.5	320.0	8040.0	1312.7	158.0
Ramona Municipal Water District	198.4	226.3	9612.3	1300.0	155.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Rancho California Water District	2057.3	940.8	44734.7	1271.7	110.5
Red Bluff City Of	77.9	81.0	4865.0		63.0
Redding City Of	1872.8	558.5	29263.5	261.7	80.0
Redlands City Of	1100.8	406.2	21017.0	235.3	87.0
Redwood City	650.1	264.6	24605.7	1948.9	64.7
Reedley City Of	1099.4	92.2	6329.0	132.1	50.7
Rialto City Of	280.7	197.3	11833.3	141.1	71.7
Rincon Del Diablo Municipal Water District	255.9	119.0	7218.0	1870.9	106.7
Rio Linda-Elverta Community Water District	195.0	61.9	4631.7	122.7	53.3
Rio Vista City Of	117.6	46.0	4706.0	161.7	67.5
Riverbank City Of	158.6	66.0	7323.3	82.8	60.0
Riverside City Of	4327.2	985.9	70478.3	98.7	89.0
Riverside Highland Water Company	54.1	77.7	4584.3	112.2	72.0
Rohnert Park City Of	280.3	116.1	9283.7	458.2	58.0
Rosamond Community Service District	153.0	97.3	5030.0	958.2	80.0
Roseville City Of	2002.2	614.2	43580.0	133.7	84.0
Rowland Water District	287.6	207.0	13771.7	1037.3	85.5
Rubidoux Community Service District	393.1	71.6	6284.0	91.9	85.0
Rubio Canyon Land And Water Association	78.6	60.0	3129.3	378.1	70.0
Sacramento City Of	6465.0	1708.3	150898.0	100.7	45.0
Sacramento County Water Agency	2202.3	544.7	36264.3	176.5	60.7
Sacramento Suburban Water District	1168.4	706.9	47238.7	156.7	58.9
San Bernardino City Of	2556.1	755.8	47915.3	158.5	80.3
San Bernardino County Service Area64Spring Valley Lake	305.5	40.4	3901.3	156.7	75.0
San Bernardino County Service Area70J Oak Hills	181.8	156.0	3285.3	637.1	85.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
San Bruno City Of	231.8	120.3	11699.0	622.7	81.3
San Buenaventura City Of(Ventura)	671.0	394.5	30104.0	465.8	93.0
San Clemente City Of	709.5	212.6	17403.3	1063.1	75.3
San Diego City Of	10519.5	3370.2	296100.3	1289.7	93.4
San Dieguito Water District	314.4	176.4	11966.0	1323.6	82.0
San Fernando City Of	165.0	67.1	5132.7	164.3	72.0
San Francisco Public Utilities Commision	4970.3	1257.6	178166.0	90.3	76.1
San Gabriel County Water District	253.2	82.0	9215.7	84.9	80.0
San Gabriel Valley Water Company	1169.1	566.2	49312.3	880.8	75.0
San Gabriel Valley Water Company Fontana Division	2189.7	692.1	48373.3	812.5	80.0
San Jacinto City Of	186.6	126.7	4197.3	518.0	65.0
San Jose City Of	1157.9	343.0	27182.0	1579.6	91.0
San Jose Water Company	6292.5	2477.7	234386.3	1226.1	73.6
San Juan Capistrano City Of	172.6	207.3	11734.3	884.7	60.0
San Juan Water District	922.4	209.9	10687.3	266.6	72.0
San Lorenzo Valley Water District	441.6	185.0	8014.0	224.1	80.0
San Luis Obispo City Of	338.2	177.6	11043.0	270.4	70.0
Santa Ana City Of	670.9	505.3	43250.0	617.5	73.9
Santa Barbara City Of	832.4	323.0	27121.0	482.5	120.8
Santa Clara City Of	755.9	312.9	26406.0	1301.4	66.9
Santa Cruz City Of	507.5	271.2	24524.0	183.8	91.1
Santa Fe Irrigation District	447.5	160.0	7509.0	1223.9	80.0
Santa Fe Springs City Of	218.4	108.0	6283.5	812.5	69.5
Santa Margarita Water District	1012.1	625.1	55648.3	952.1	90.0
Santa Maria City Of	284.2	337.5	22709.3	232.5	79.3
Santa Monica City Of	43.6	206.8	18109.3	994.1	74.5

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Santa Paula City Of	91.7	97.8	7572.3	216.4	66.4
Santa Rosa City Of	992.2	644.3	54388.3	851.6	69.0
Scotts Valley Water District	92.0	65.1	4132.0	426.2	100.0
Seal Beach City Of	162.4	74.8	5513.3	513.5	65.0
Shafter City Of	327.3	108.6	4699.3	136.9	55.0
Shasta Lake City Of	100.5	79.4	3740.3	158.8	83.0
Sierra Madre City Of	317.5	47.6	3715.5	160.0	103.0
Signal Hill City Of	69.6	50.0	3331.0	921.0	78.5
Soledad City Of	76.5	14.6	3884.0	155.5	55.3
Sonoma City Of	112.3	54.3	4404.7	866.6	70.7
Soquel Creek Water District	235.8	172.4	15863.7	176.6	76.4
South Coast Water District	119.4	163.3	13114.0	1012.9	87.5
South Feather Waterand Power	446.6	200.0	7000.0		90.0
South Gate City Of	180.9	169.0	14408.5	418.5	65.0
South Pasadena City Of	210.5	67.8	6239.0	1044.0	79.3
South Tahoe Public Utility District	1134.6	253.0	14173.7	164.2	84.0
Stockton City Of	1938.8	601.5	48791.3	564.5	60.0
Suburban Water Systems-San Jose Hills	805.4	483.9	42870.3	566.5	77.9
Suburban Water Systems-Whittier-La Mirada	861.9	376.7	33874.7	471.3	78.5
Suisun-Solano Water Authority	447.3	95.8	8475.0	108.2	55.0
Sunny Slope Water Company	192.1	60.2	6300.0	165.5	72.5
Sunnyslope Community Water District	98.2	80.2	5921.3	95.6	72.0
Sunnyvale City Of	667.0	347.7	28926.7	1560.4	72.7
Susanville City Of	253.8	43.5	3808.3	70.2	81.8
Sweetwater Authority	592.3	408.0	34363.0	1554.9	74.3
Sweetwater Springs Water District	125.2	65.0	3800.0	272.9	75.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Tehachapi City Of	170.8	55.5	3307.0	142.5	75.2
Thousand Oaks City Of	269.2	229.9	17050.3	1525.8	80.5
Torrance City Of	201.6	320.0	27041.7	993.3	75.0
Trabuco Canyon Water District	90.5	66.5	3989.7	885.1	90.0
Tracy City Of	1062.6	458.3	24121.7	485.0	60.0
Triunfo Sanitation District-Oak Park Water Service	8.5	46.0	4700.0	1646.8	80.0
Truckee-Donner Public Utilities District	909.6	231.7	12871.0	294.4	84.3
Tulare City Of	417.1	227.0	19839.0	87.0	50.0
Tuolumne Utilities District-Sonora Jamestown	*422.7*	*102.4*	*4984.7*	*155.2*	*87.7*
Tuolumne Utilities District-Upper Basin	*141.4*	*105.6*	*3995.0*	*155.2*	*72.0*
Turlock City Of	1241.8	305.0	19100.3	57.2	54.7
Tustin City Of	593.1	172.0	14165.0	633.9	50.0
Twentynine Palms Water District	283.6	211.0	8087.3	185.7	85.0
Ukiah City Of	205.2	62.0	4779.0	108.5	85.0
Upland City Of	584.8	255.6	20733.0	805.0	100.0
Vacaville City Of	896.7	359.4	28254.7	644.0	80.0
Valencia Water Company	1101.2	367.2	32598.7	535.2	103.9
Vallecitos Water District	882.2	376.6	22469.7	2030.6	117.4
Vallejo City Of	2638.3	483.3	40646.0	227.0	65.0
Valley Center Municipal Water District	320.4	342.7	10066.7	1444.2	120.0
Valley County Water District	180.8	126.0	12649.3	492.0	63.0
Valley Of The Moon Water District	230.9	92.5	7108.0	1609.6	65.0
Valley Water Company	54.9	55.0	3657.0	1578.0	70.0
Vaughn Water Company	375.0	220.4	10727.7	0.5	50.0
Ventura County Waterworks District No01-Moorpark	434.1	171.0	10912.7	1289.3	83.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Ventura County Waterworks District No08-Simi Valley	387.4	350.3	25762.0	1081.0	100.0
Vernon City Of	295.6	50.4	1022.0	589.4	75.0
Victorville Water District	2135.2	752.0	35561.0	424.0	86.8
Vista Irrigation District	765.4	467.4	28706.7	994.2	97.7
Walnut Valley Water District	869.4	482.0	27471.0	1032.0	103.0
Wasco City Of	86.0	79.0	5009.3	208.0	51.8
Watsonville City Of	335.0	178.0	14806.3	116.6	65.0
West Kern Water District	1820.3	318.0	7733.3	156.1	60.0
West Sacramento City Of	3797.5	200.0	14367.3	89.5	55.0
West Valley Water District	1502.0	375.1	21441.3	291.9	70.0
Westborough Water District	35.7	24.5	3928.7	1904.1	77.7
Western Municipal Water District Of Riverside	1507.1	493.4	20839.3	1048.8	100.0
Westminster City Of	335.8	251.0	20638.0	317.0	63.7
Whittier City Of	258.2	143.0	11516.0	433.6	65.0
Windsor Town Of	174.6	139.1	5524.0	428.3	78.6
Woodland City Of	462.6	277.1	16049.7	820.4	55.0
Yorba Linda Water District	1134.0	366.3	25013.0	725.8	82.0
Yreka City Of	234.3	90.8	3047.3	137.6	84.3
Yuba City	754.4	299.3	18813.7	86.2	56.1
Yucaipa Valley Water District	668.2	209.0	12893.0	202.7	50.0

Appendix F – 2015 SBX7-7 Verification Form

SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	34,052	Acre Feet
	2008 total volume of delivered recycled water	2,985	Acre Feet
	2008 recycled water as a percent of total deliveries	8.77%	Percent
	Number of years in baseline period[1,2]	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range[3]	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. *[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

NOTES:

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☑	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: Service Area Population		
Year		Population
10 to 15 Year Baseline Population		
Year 1	1995	54,602
Year 2	1996	58,424
Year 3	1997	62,619
Year 4	1998	66,761
Year 5	1999	71,824
Year 6	2000	74,562
Year 7	2001	78,420
Year 8	2002	83,167
Year 9	2003	89,289
Year 10	2004	94,561
5 Year Baseline Population		
Year 1	2003	89,289
Year 2	2004	94,561
Year 3	2005	99,295
Year 4	2006	101,641
Year 5	2007	103,693
2015 Compliance Year Population		
2015		123,572
NOTES: Does not include approximately 4,810 person living within City limits, but outside the water service area.		

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	All Sources
This water source is:	
☑	The supplier's own water source
☑	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	18,841		18,841
Year 2	1996	21,254		21,254
Year 3	1997	23,001		23,001
Year 4	1998	20,462		20,462
Year 5	1999	24,179		24,179
Year 6	2000	25,646		25,646
Year 7	2001	28,100		28,100
Year 8	2002	29,853		29,853
Year 9	2003	29,714		29,714
Year 10	2004	32,468		32,468
5 Year Baseline - Water into Distribution System				
Year 1	2003	29,714		29,714
Year 2	2004	32,468		32,468
Year 3	2005	31,481		31,481
Year 4	2006	33,637		33,637
Year 5	2007	33,864		33,864
2015 Compliance Year - Water into Distribution System				
2015		22,881		22,881

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1995	18,841			-		-	18,841
Year 2	1996	21,254			-		-	21,254
Year 3	1997	23,001			-		-	23,001
Year 4	1998	20,462			-		-	20,462
Year 5	1999	24,179			-		-	24,179
Year 6	2000	25,646			-		-	25,646
Year 7	2001	28,100			-		-	28,100
Year 8	2002	29,853			-		-	29,853
Year 9	2003	29,714			-		-	29,714
Year 10	2004	32,468			-		-	32,468
10 - 15 year baseline average gross water use								**25,352**
5 Year Baseline - Gross Water Use								
Year 1	2003	29,714			-		-	29,714
Year 2	2004	32,468			-		-	32,468
Year 3	2005	31,481			-		-	31,481
Year 4	2006	33,637			-		-	33,637
Year 5	2007	33,864			-		-	33,864
5 year baseline average gross water use								**32,233**
2015 Compliance Year - Gross Water Use								
2015		22,881	-		-		-	**22,881**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES:

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	54,602	18,841	308
Year 2	1996	58,424	21,254	325
Year 3	1997	62,619	23,001	328
Year 4	1998	66,761	20,462	274
Year 5	1999	71,824	24,179	301
Year 6	2000	74,562	25,646	307
Year 7	2001	78,420	28,100	320
Year 8	2002	83,167	29,853	320
Year 9	2003	89,289	29,714	297
Year 10	2004	94,561	32,468	307
10-15 Year Average Baseline GPCD				**309**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	89,289	29,714	297
Year 2	2004	94,561	32,468	307
Year 3	2005	99,295	31,481	283
Year 4	2006	101,641	33,637	295
Year 5	2007	103,693	33,864	292
5 Year Average Baseline GPCD				**295**
2015 Compliance Year GPCD				
2015		123,572	22,881	**165**
NOTES:				

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	309
5 Year Baseline GPCD	295
2015 Compliance Year GPCD	165
NOTES:	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
309	**247**
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
295	280	247	**247**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

NOTES:

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
247	309	**278**

NOTES:

SB X7-7 Table 9: 2015 Compliance								
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(In GPCD)* Enter "0" if Adjustment Not Used: Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
165	278	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	-	165	165	**YES**

NOTES:

Appendix G – 2020 SBX7-7 Compliance Form

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
NOTES: The population for areas in the City of Roseville boundary not served by the City of Roseville Water Utility was subtracted from the total 2020 DOF population.	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	140,187
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
		2020 Deductions					
Compliance Year 2020	2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use*	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	2020 Gross Water Use
	33,263	1,451	-	-	-	-	**31,813**
* **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.							
NOTES:							

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Folsom Lake
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	31,711	-	31,711

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: Total volume excludes raw water delivered to Linda Creek.

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment

Complete one table for each source.

Name of Source	Ground Water
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	201	0	201

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Total water delivered from other suppliers to Roseville
This water source is *(check one)* **:**	
☐	The supplier's own water source
☑	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	1,352	0	1,352

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
31,813	140,187	**203**
NOTES:		

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
203	-	-	-	-	203	247	**YES**
[1] *All values are reported in GPCD*							
[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*							
NOTES:							

Appendix H – Intent to Retain Control of Conserved Water

RESOLUTION NO. 09-64

DECLARING AN INTENT TO RETAIN CONTROL OF CONSERVED WATER

WHEREAS, the City has contractual entitlements to divert water from Folsom Reservoir, under which the City diverts and treats water for distribution to its residents and water users; and

WHEREAS, the City plans to implement a series of water conservation projects and programs for the purpose of eliminating losses of water within its water transmission and distribution system and for reducing consumption of water by its customers through on-site efficiency improvements and curtailment of water waste; and

WHEREAS, Water Code section 1011 provides that water is deemed conserved when less water is used to accomplish the same purposes of use allowed under a water right and that such cessation or reduction in use is deemed a beneficial use of a water right to the extent of such cessation or reduction in use; and

WHEREAS, Water Code section 1011 and the City's CVP water service contract authorizes the City to make water conserved as a result of such water conservation projects and programs available for use, sale, lease, exchange or short- or long-term transfers inside and outside of the City; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville as follows:

1. The foregoing recitals are true and are incorporated into this Resolution by this reference.

2. The City Council finds and determines that: (a) making significant investments in infrastructure and administrative resources protects the City's water supplies for the benefit of all residents and water users in the City; (b) protecting all of the City's water supplies is of paramount importance to the health and welfare of the City's residents and water users; (c) conserving water through reductions in use is intended to promote statewide policies mandating and encouraging beneficial use of water; and (d) preserving conserved water supplies and making those supplies available for use, sale or transfer is in the best interests of the City and its residents and water users.

3. The City Council declares that, by instituting programs to conserve water, it abandons no right, title or interest in or to any City water rights, contractual entitlements or any appurtenant rights necessary to exercise such water rights or entitlements.

4. In accordance with Water Code section 1011 and any contractual rights, the City reserves the right to sell, lease, exchange, or otherwise transfer for use within or outside of the City's boundaries all water that has been conserved as a result of its water conservation projects and programs.

5. The Environmental Utilities Director and staff are directed to take all actions necessary to implement this Resolution, including the filing of annual reports of reductions in water use resulting from any water conservation projects and programs carried out under this Resolution with the State Water Resources Control Board.

PASSED AND ADOPTED by the City Council of the City of Roseville on the 18th day of February 2009, by the following vote:

AYES COUNCILMEMBERS: Allard, Gray, Garcia, Roccucci, Garbolino

NOES COUNCILMEMBERS: None

ABSENT COUNCILMEMBERS: None

MAYOR

Attest:

City Clerk

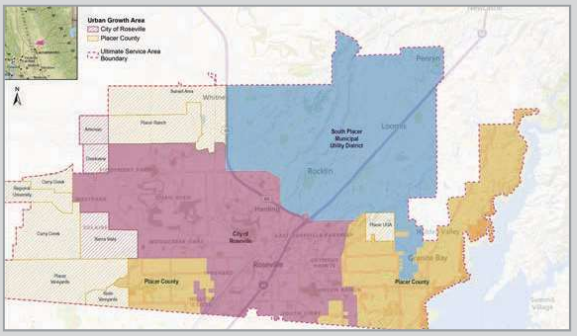
Appendix I – Regional 2020 Wastewater Systems Evaluation Report

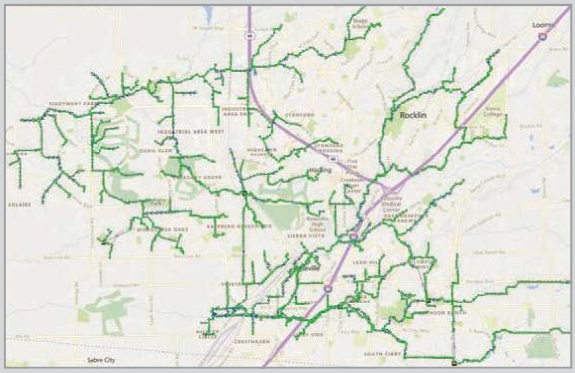
SOUTH PLACER WASTEWATER AUTHORITY

Partners: City of Roseville, Placer County, South Placer Municipal Utility District

South Placer Regional Wastewater 2020 Systems Evaluation Report









December 2020

Prepared by

WOODARD &CURRAN

SOUTH PLACER REGIONAL WASTEWATER 2020 SYSTEMS EVALUATION REPORT



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COMMITMENT & INTEGRITY DRIVE RESULTS

0011183.00
South Placer Wastewater Authority
December 2020

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APPENDICES

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List of Abbreviations

AA	average annual
ac	acres
ADWF	average dry weather flow
AFY	acre feet per year
APN	assessor parcel number
BOD	biochemical oxygen demand
BSF	base sanitary flow
CIP	Capital Improvement Program
DC	Dry Creek
DCWWTP	Dry Creek Wastewater Treatment Plant
du, DU	dwelling unit
DWF	dry weather flow
ea	each
EDU	Equivalent Dwelling Unit
ENR-CCI	Engineering News Record Construction Cost Index
ft	feet
FY	fiscal year
GIS	Geographical Information System
gpd	gallons per day
gpm	gallons per minute
GWI	groundwater infiltration
I/I	inflow and infiltration
in	inches
lb/day	pounds per day
MCRT	mean cell residence time
MG	million gallons
mgd	million gallons per day
MM	maximum month
NPDES	National Pollutant Discharge Elimination System
PDWWF	peak day wet weather flow
PG	Pleasant Grove
PGWWTP	Pleasant Grove Wastewater Treatment Plant
PHWWF	peak hour wet weather flow
PMF	peak month flow
PS	pump station
PWWF	peak wet weather flow
RAS	return activated sludge
RDI/I	rainfall dependent infiltration/inflow

RWQCB	Regional Water Quality Control Board
SMD-2	Placer County Sewer Maintenance District 2
SMD-3	Placer County Sewer Maintenance District 3
SPMUD	South Placer Municipal Utility District
SPWA	South Placer Wastewater Authority
SWRCB	State Water Resources Control Board
Systems Evaluation	Regional Wastewater and Recycled Water Systems Evaluation
TM	technical memorandum
TSS	total suspended solids
UGA	Urban Growth Area
UV	ultraviolet
WAS	waste activated sludge
WWF	wet weather flow
WWTP	wastewater treatment plant

EXECUTIVE SUMMARY

This report summarizes the results and recommendations of the Systems Evaluation prepared for the South Placer Wastewater Authority (SPWA), which is a Joint Powers Authority comprised of the City of Roseville (City), South Placer Municipal Utility District (SPMUD), and the County of Placer (Placer County). The Systems Evaluation was prepared by Woodard & Curran in close coordination with City, County and District staff. The Systems Evaluation will be used to guide improvements to the regional wastewater collection system and wastewater treatment plants to accommodate current and future development and ensure that SPWA's customers continue to receive a high level of service.

Background and Purpose of the Systems Evaluation

The South Placer Wastewater Authority (SPWA) was created under a Joint Powers Agreement in October 2000 and comprises the City of Roseville (City), South Placer Municipal Utility District (SPMUD), and the County of Placer (Placer County). Flow from SPMUD and portions of Placer County discharge into the City's sewer collection system. The City of Roseville, on behalf of the regional partners, owns and operates two regional wastewater treatment facilities: the Pleasant Grove Wastewater Treatment Plant (PGWWTP), and the older Dry Creek Wastewater Treatment Plant (DCWWTP). Additionally, the City of Roseville owns and operates the network of gravity sewers, pump stations, and force mains that serve customers within the City's limits, including the joint (regional) facilities that convey flow from the SPWA partners. SPMUD owns and operates gravity sewers, pump stations, and force mains in Rocklin, Loomis, and portions of southern Placer County. Placer County owns and operates gravity sewers, pump stations, and force mains in unincorporated areas of Placer County that are not served by other agencies.

The South Placer Regional Wastewater and Recycled Water Systems Evaluation prepared in 2009 (2009 Systems Evaluation), defined the SPWA service area boundary; evaluated the wastewater collection, wastewater treatment, and recycled water distribution systems; and identified existing and potential future improvement needs. Since that study was completed, the recycled water distribution system has been "removed" from the SPWA system (reallocated as an asset) and is now wholly managed by the City of Roseville. SPWA is now updating the Systems Evaluation to better evaluate future wastewater collection and treatment capacity needs that may have changed since 2009. This report documents the evaluation of the wastewater collection system capacity and the capacity of the wastewater treatment plants versus projected flows and loads.

This South Placer Regional Wastewater Systems Evaluation (Systems Evaluation) has been conducted to accomplish the following:

- Document the existing (2020) capacity and the flows and loadings on regional trunk sewer and wastewater treatment infrastructure and facilities present in 2020;
- Project buildout conditions based upon regional planning documents and planned regional developments in southwestern Placer County; and,
- Present a Regional Systems evaluation, with system deficiencies identified, and capital projects forecasted, which will inform the SPWA partners in identifying their ability to provide service for planned and proposed development both presently and for buildout conditions.

The service area is shown in **Figure 1-1**, and the regional collection system is shown in **Figure ES-2**. Figure 1-1 also indicates the location of the Urban Growth Areas (UGAs) within the service area, which are included in this study. Note that Creekview has been incorporated into the City of Roseville service area as of January 2019, while Amoruso and Sierra Vista are anticipated to be incorporated into the City's service area in early 2021.

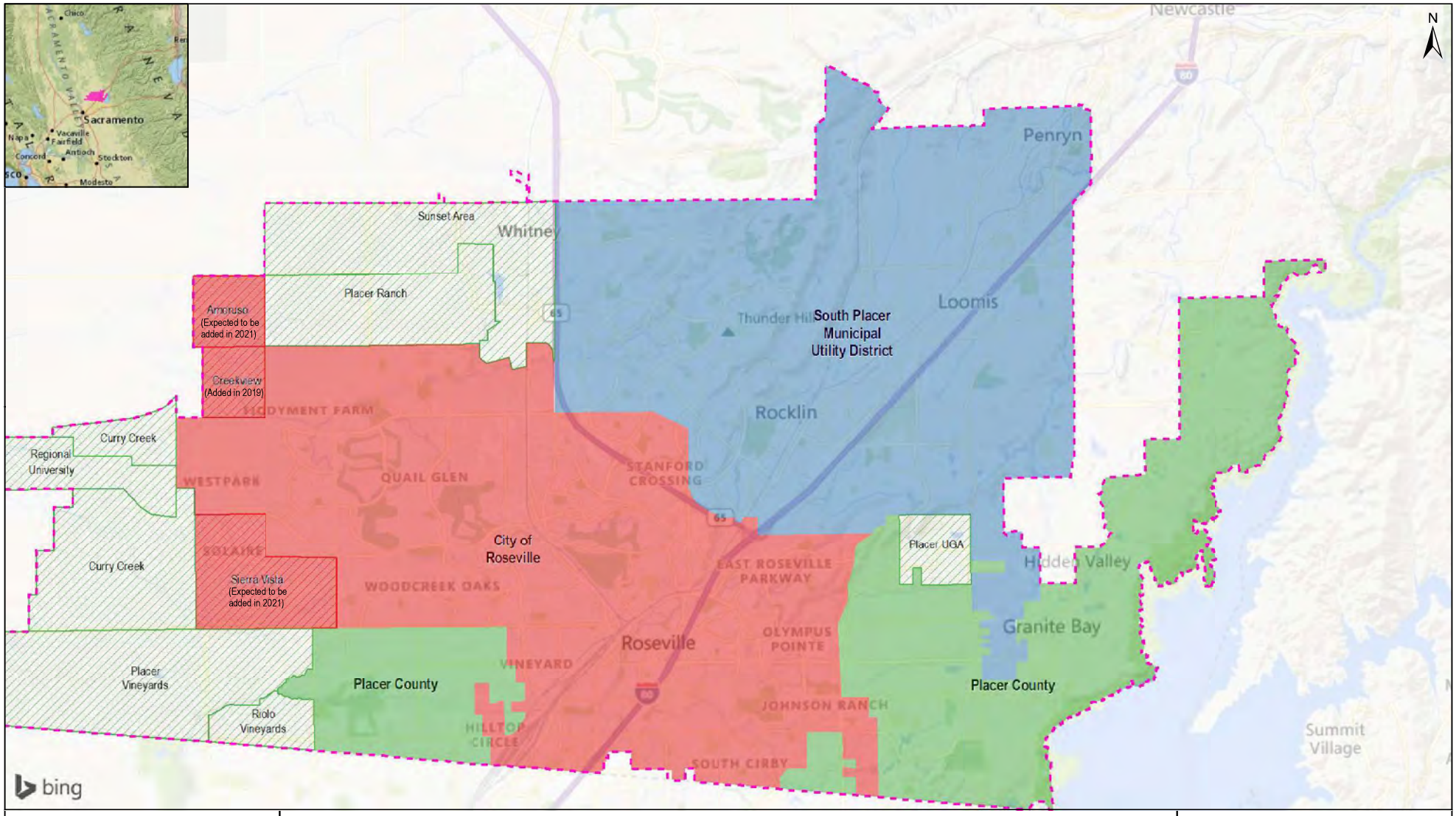


Figure ES-1
2021 Service Area Boundary

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

2021 Partner Agency Service Area
- City of Roseville
- Placer County
- SPMUD

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Ultimate Service Area Boundary

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Map Created: December 2020

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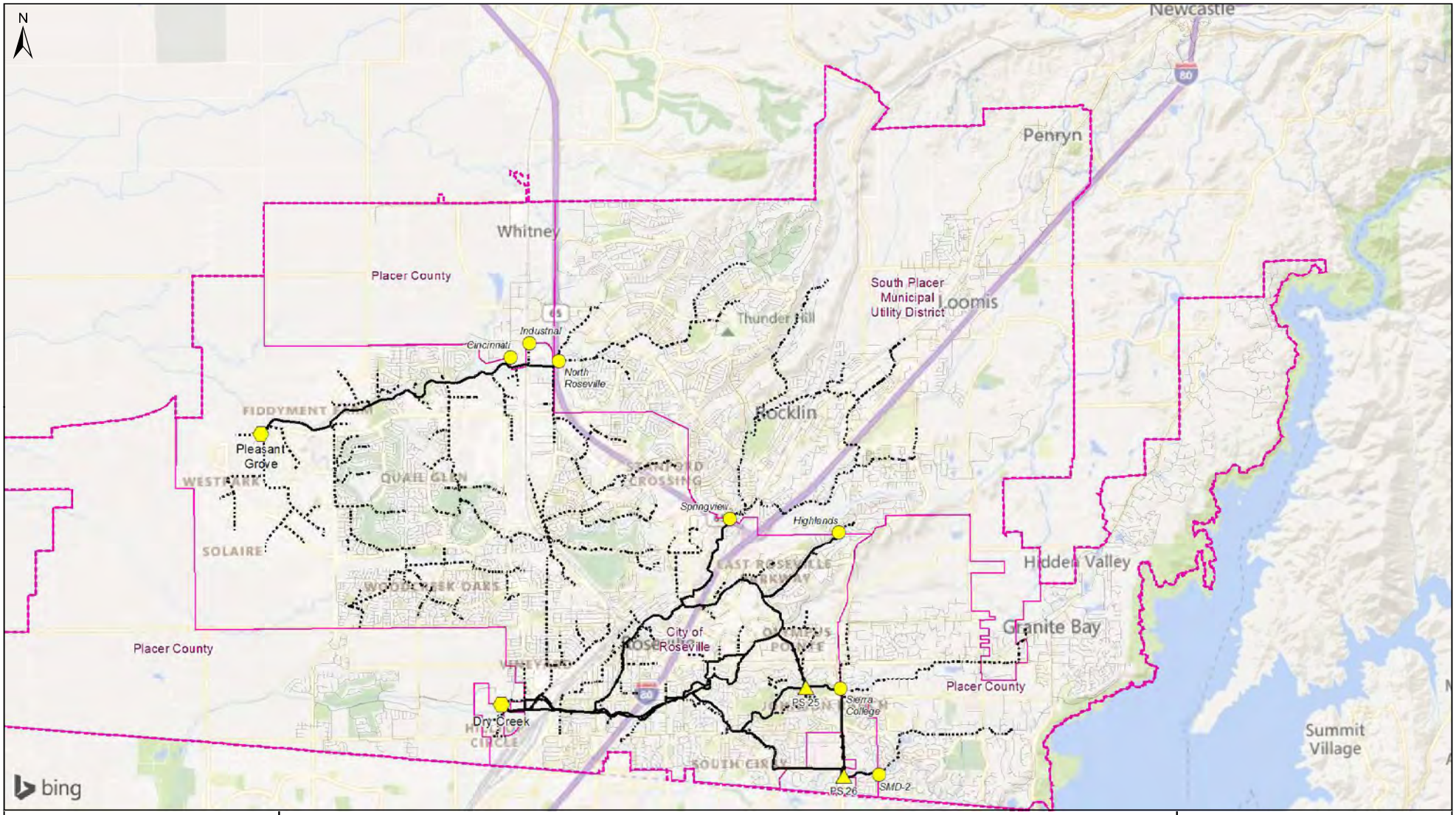


Figure ES-2
Modeled Trunk System

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

- Regional Gravity Sewer
- Regional Force Main
- Non-Regional Modeled Sewer
- Non-Modeled Sewer
- Wastewater Treatment Plant
- Pump Station
- Permanent Flow Meters
- Partner Agency Boundary
- Ultimate Service Area Boundary

Project #: 0011183.00
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Modeled Flow Projections

The flow projections developed for this Systems Evaluation were based on the information collected for the system's hydraulic model updates, including the updates performed for the current study. In 2007, a hydraulic model of the City's sewer collection system was developed using the H2OMap Sewer modeling platform (2007 Model Development Project), in parallel with a trunk sewer model for the combined Roseville, SPMUD, and Placer County systems. The models were later updated as part of the 2009 Systems Evaluation. Subsequently, the City's sewer model was updated in 2017 to reflect existing and future demands within the City, and to upgrade the modeling platform to the fully dynamic InfoWorks ICM software. For the current Systems Evaluation Update, the City's model was updated to reflect existing and future projected flows from Placer County and SPMUD.

Existing base wastewater flows were developed based on the assumptions summarized below; currently connected parcels are indicated in **Figure ES-3**. Note that flow projections (referred herein as loads) are intended to represent the level of development present during the flow monitoring periods used to calibrate the hydraulic model. Buildout loads were based on projected development within the service area. Two buildout scenarios were developed: (1) Buildout scenario representing the currently anticipated development density, and (2) Buildout-Sensitivity scenario, representing higher density development and some potential redevelopment areas.

For the City of Roseville, existing loads were developed based on water consumption data, and calibrated during the 2017 model update. A 15% rebound to reflect drought conditions was assumed for existing sewer loads. A buildout scenario was developed based on infill of currently vacant parcels using land use information from the City's General Plan or provided by the City's planning department, and development of UGAs within the City. The Buildout-Sensitivity scenario considers potential intensification and redevelopment in the downtown Roseville area.

Placer County provided spreadsheets summarizing existing equivalent dwelling units (EDUs) for each APN[1], which formed the basis of the existing model loads. (Note: an EDU is defined as the flow equivalent of one single-family residence.) For the Buildout scenario, flows were based on a spreadsheet provided by Placer County that summarized the anticipated EDUs for all entitled projects in Placer County[2], development of other currently vacant parcels (based on general plan data[2]), and development of the Placer County UGAs. For the Buildout scenario, an average development density for vacant parcels was assumed within the General Plan limits. For the Buildout-Sensitivity scenario, the development density was assumed to be at the maximum range allowed by the General Plan. A Base Wastewater Flowrate (BWF) of 180 gpd per EDU was assumed for Placer County and SPMUD.

SPMUD provided a shapefile[3] which provided EDUs for the year 2020 (which was identified as "existing" land use by SPMUD staff), and 2060 (which was identified as "Buildout" by SPMUD staff). This shapefile formed the basis of the Existing and Buildout scenarios.

For the UGAs, land use and flow projections were based on the most recent wastewater master plans for each UGA.

The locations of future developments, including urban growth areas, are indicated in **Figure ES-4.**

[1] Spreadsheets included: Existing dry creek EDU-7-24-19.xls, Existing SMD 2- EDU-2018-12-12.xlsx, Existing SMD 3- EDU-2018-12-12.xlsx, Existing Sunset EDU-7-24-19.xls

[2] 2018-12-18-Entitled-Planned Project.xlsx (provided December, 2018) and GeneralPlans_CommPlans.shp (downloaded from Placer County website, dated October 20, 2019)

[3] SPMUD_SewerLoading_AddressPoints, provided August 7, 2019.

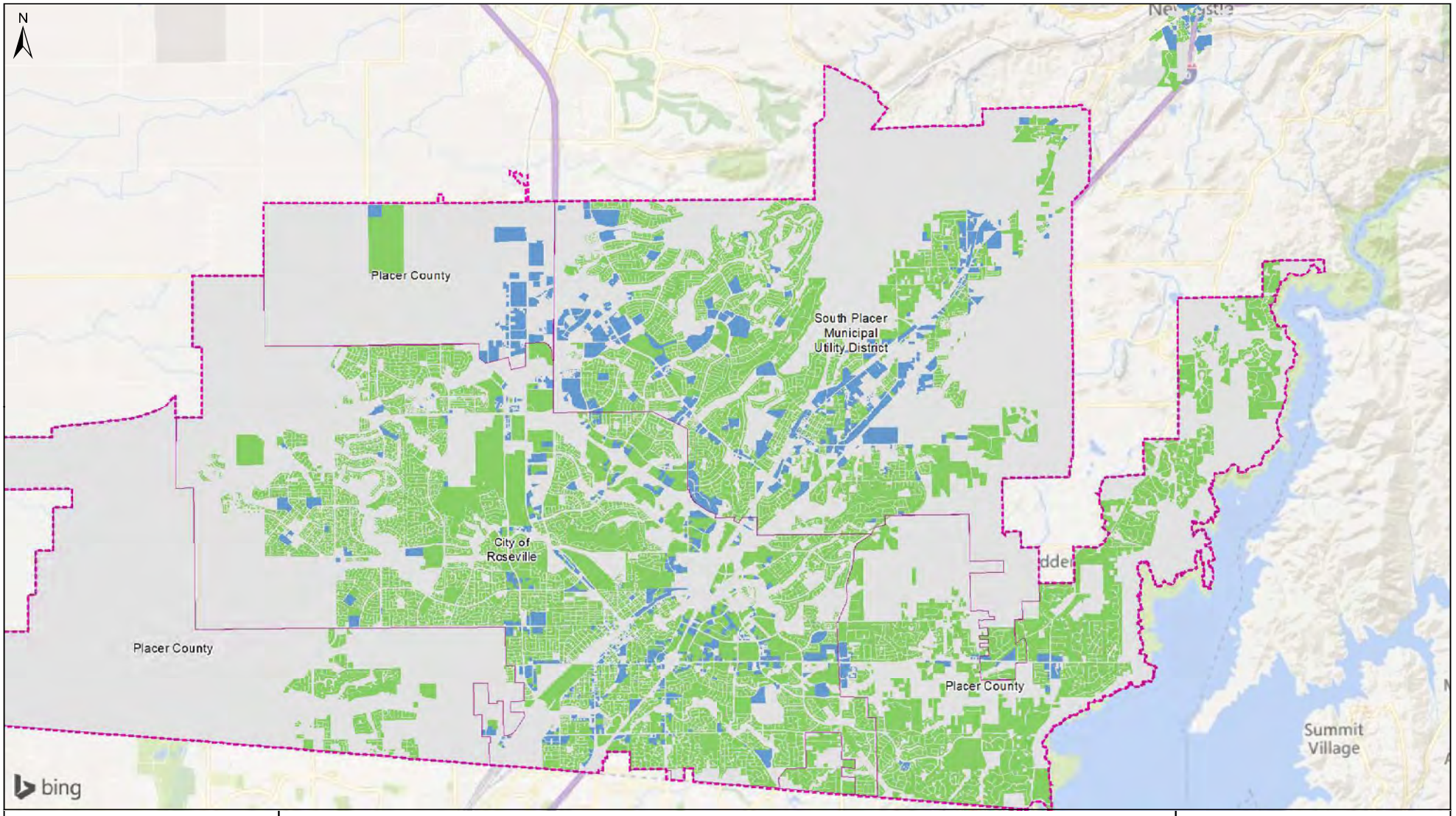


Figure ES-3

Existing Connected Parcels

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Parcel Land Use

- Commercial/Industrial
- Residential
- Unconnected

- Service Area Boundary
- Partner Agency Boundary

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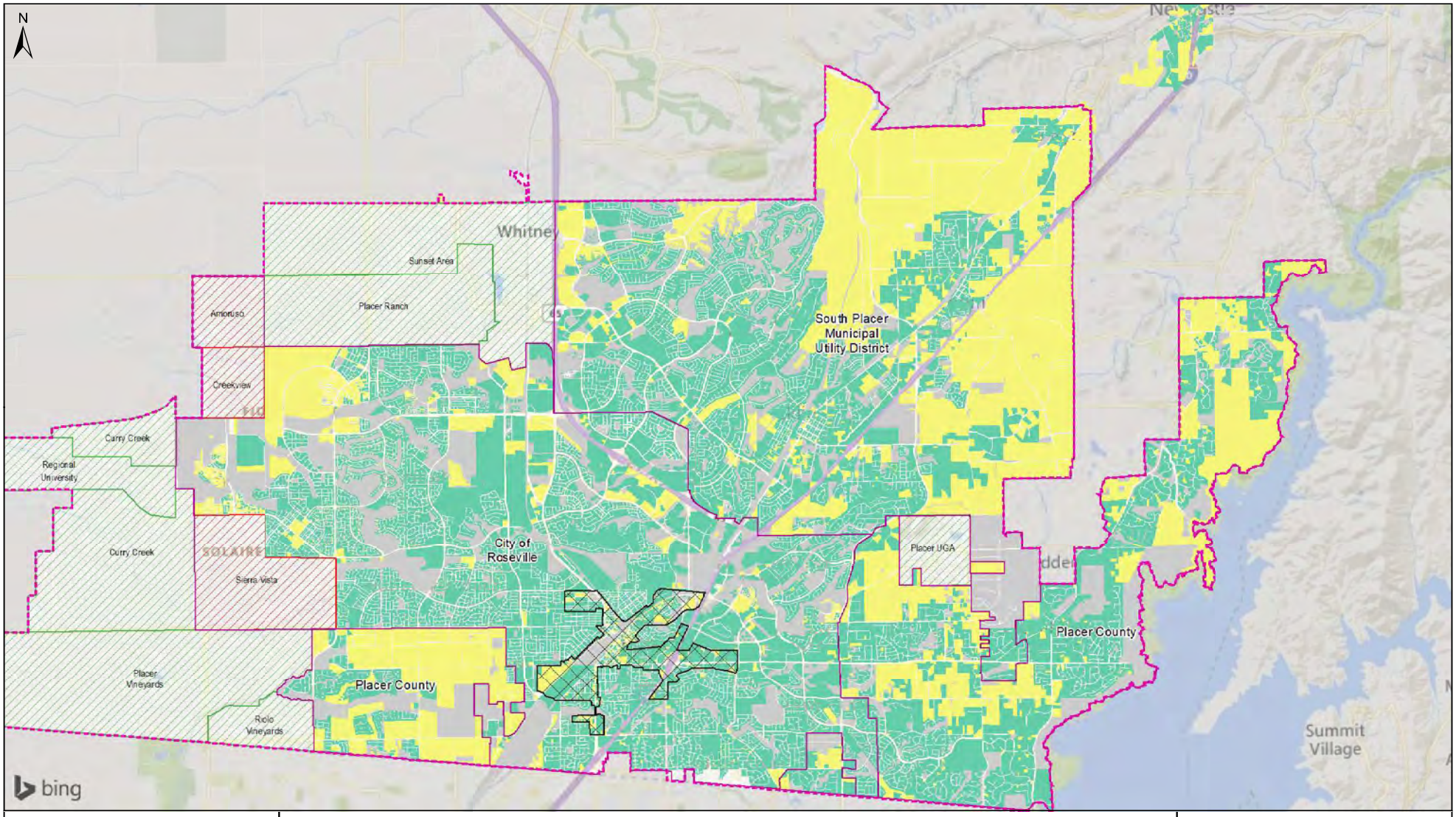


Figure ES-4

Future Development and Urban Growth Areas

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Buildout Status
- Existing
- Future Connection
- Unconnected
- Redevelopment Area

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Service Area Boundary

Partner Agency Boundary

Project #: 0011183.00
Map Created: December 2020

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Model loads were calibrated based on temporary monitoring programs for the 2015/2016 wet weather season (30 meters for the City's 2017 Model Update) and 12 meters during the 2018/2019 wet weather season (for SPMUD and Placer County). V&A Consulting Engineers, under subcontract to Woodard & Curran, conducted the monitoring. As part of the calibration process, rates of wet season groundwater infiltration (GWI, observed as a constant additional flow throughout the monitoring period), and rainfall-dependent inflow and infiltration (RDI/I) were calculated. Existing and projected flows predicted by the model are summarized in **Table ES-1** and **Table ES-2**.

Table ES-1: Estimated Dry Weather Flows[a] by Agency

WWTP	Agency	Existing Calibration ADWF (mgd)	Existing ADWF with Drought Rebound	Buildout ADWF (mgd)	Buildout-Sensitivity[b] ADWF (mgd)
Pleasant Grove	Roseville	5.87	6.70	13.01	13.04
	Placer County	0.18	0.20	9.85	9.85
	SPMUD	2.25	2.97	3.63	3.63
	Total	**8.30**	**9.87**	**26.49**	**26.52**
Dry Creek	Roseville	5.60	6.27	6.89	8.23
	Placer County	2.57	2.81	7.19	7.42
	SPMUD	2.90	3.64	5.16	5.16
	Total	**11.06**	**12.72**	**19.24**	**20.81**

Notes:
a. Includes wet season GWI.
b. For the Buildout-Sensitivity scenario, the development density was assumed to be at the maximum range allowed by the General Plan. A Base Wastewater Flowrate (BWF) of 180 gpd per EDU was assumed for Placer County and SPMUD

Table ES-2: Modeled ADWF And Peak WW Flow Summary

	Existing (Rebound)			Buildout			Buildout-Sensitivity		
WWTP	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a]	ADWF (mgd)	PWWF[b] (mgd)
Pleasant Grove	9.5	9.9	27.4	26.1	26.5	55.8	26.2	26.5	56.0
Dry Creek	10.1	12.7	41.9	16.7	19.2	59.2	18.2	20.8	60.6

Notes:
a. Does not include wet season groundwater infiltration (GWI).
b. Modeled PWWF assumes improvements have been implemented to eliminate overflows and significant surcharging.

Trunk Sewer Evaluation

The calibrated model was run for Existing, Buildout, and Buildout-Sensitive land use scenarios under the design event described above. Several deficiencies were identified in non-regional facilities which resulted in model-predicted overflows for one or more of the scenarios; to ensure flows were conveyed to regional sewers, pipes were upsized in this analysis to eliminate any overflows. As the current model is a calibrated fully-dynamic model, the design condition represents a relatively infrequent storm event, and many of SPWA's sewers are relatively deep, surcharging up to within 5 feet of the manhole rims (ground surface) was considered acceptable under 10-year design storm PWWF, as long as the surcharge (flow height in the manhole) does not exceed 4 feet from the top of pipe up the manhole.

Model results under Existing and Buildout conditions are summarized in **Table ES-3** and results for the Buildout scenario are shown in **Figure ES-5**. Within the regional system, seven deficiency areas have been identified as indicated in **Figure ES-5**. There was no significant difference in modeled surcharge between the Buildout and Buildout-Sensitivity scenarios.

Table ES-3: Sewer Capacity Results under Existing and Buildout Land Use Scenarios[a]

Area	Existing (with Rebound)			Buildout and Buildout-Sensitivity		
	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)
A	5,530	7.3	0.0	5,530	7.8	0.0
B	3,369	1.9	2.0	3,948	7.7	0.0
C	522	1.0	7.4	6,009	6.4	2.8
D	700	1.1	8.6	4,220	3.3	6.4
E	--	--	--	2,223	3.1	5.6
F	--	0.9	12.2	1,716	7.3	2.2
G	--	--	--	0	2.3	6.3

Notes:

a. Areas that exceed the hydraulic capacity criteria but do not have modeled overflows are highlighted yellow, while areas with modeled overflows are highlighted orange.

Based on these model results, improvement projects have been identified to relieve the capacity deficiencies. Improvement Project 1 would relieve existing deficiencies, while Improvement Project 2 and 3 would relieve deficiencies identified in the Buildout system. Improvement Project 2 and 3 would largely be triggered by additional growth in Placer County's SMD2 and SMD3 service areas. Subsequent model runs were performed to estimate the number of EDUs that would trigger the need for these additional projects; based on this analysis, the projects would be needed after approximately 1,800 additional EDUs (compared to 2018 development). Based on the EDU projections provided by Placer County, this additional growth is not anticipated until after Fiscal Year (FY) 2059/2060. Note that this estimate is based on dry weather flows and rainfall response estimated as part of the model update; changes in these projected flows may occur (in the future with additional flow monitoring and model updates) which would trigger the need for the projects earlier, or delay or eliminate the need for the projects.

The proposed capacity improvement projects are summarized in **Table ES-4** and the locations are shown in **Figure ES-6**.

Table ES-4: Proposed Capacity Improvement Projects

Project	Description	Estimated Capital Improvement Cost	Approximate Additional EDUs in SMD2/SMD3 to Trigger Project[a]
1	Increased Capacity of PS 26 and sewers on Sierra College Blvd directly downstream of PS 26 to relieve Old Auburn Trunk sewer (Area A)	$1,606,000	Existing
2	Redirect flows from PS 26 and Sierra College Blvd down Eureka Road to relieve Area E.	$1,831,000	~1,800[b]
3	Increased Firm capacity of PS 25 to meet Buildout PWWF. New weir structure or adjustments to existing structure at PS 25 to convey the maximum potential flow through PS 25 without any dry weather flows.	$758,000	~1,800[c]

Notes:

a. Based on a percentage of buildout factor applied to future model loads. Represents approximately 60% of buildout.

b. There are approximately 8,400 Existing EDUs upstream of the deficiency triggering Improvement Project 2, and approximately 10,200 EDUs would trigger the need for improvement. Represents approximately 60% of buildout.

c. There are approximately 11,900 Existing EDUs upstream of the deficiency triggering Improvement Project 3, including 7,600 in Placer County, 4,200 in Roseville, and less than 100 in SPMUD. Approximately 13,700 EDUs would trigger the need for the improvement.

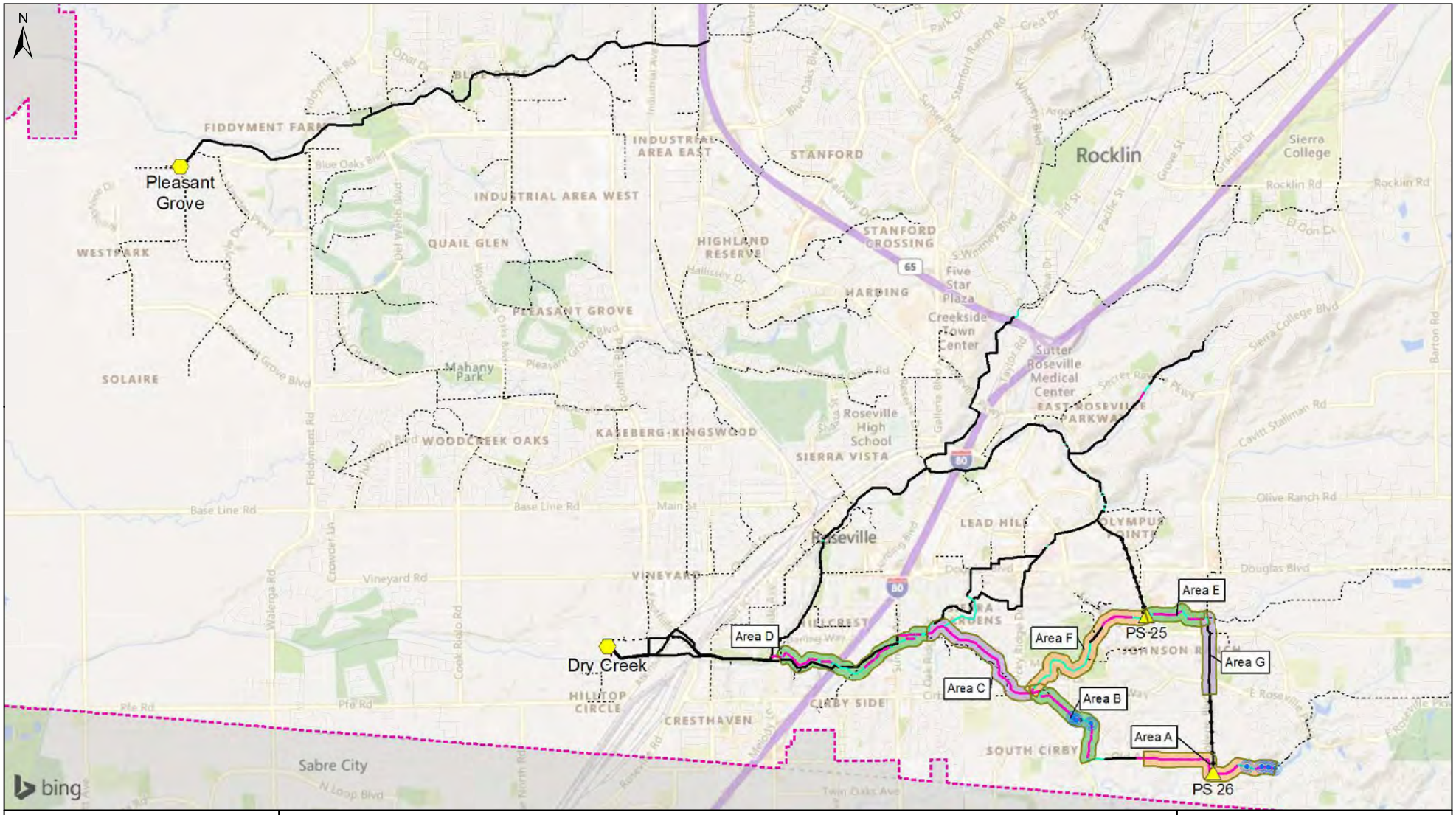


Figure ES-5

Model Results (Buildout and Buildout Sensitivity PWWF)

South Placer Wastewater Authority
2020 Systems Evaluation

0 ¼ ½ 1 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Backwater Surcharge
- Throttle Surcharge
- Modeled Sewer Overflow
- Deficiency Area
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

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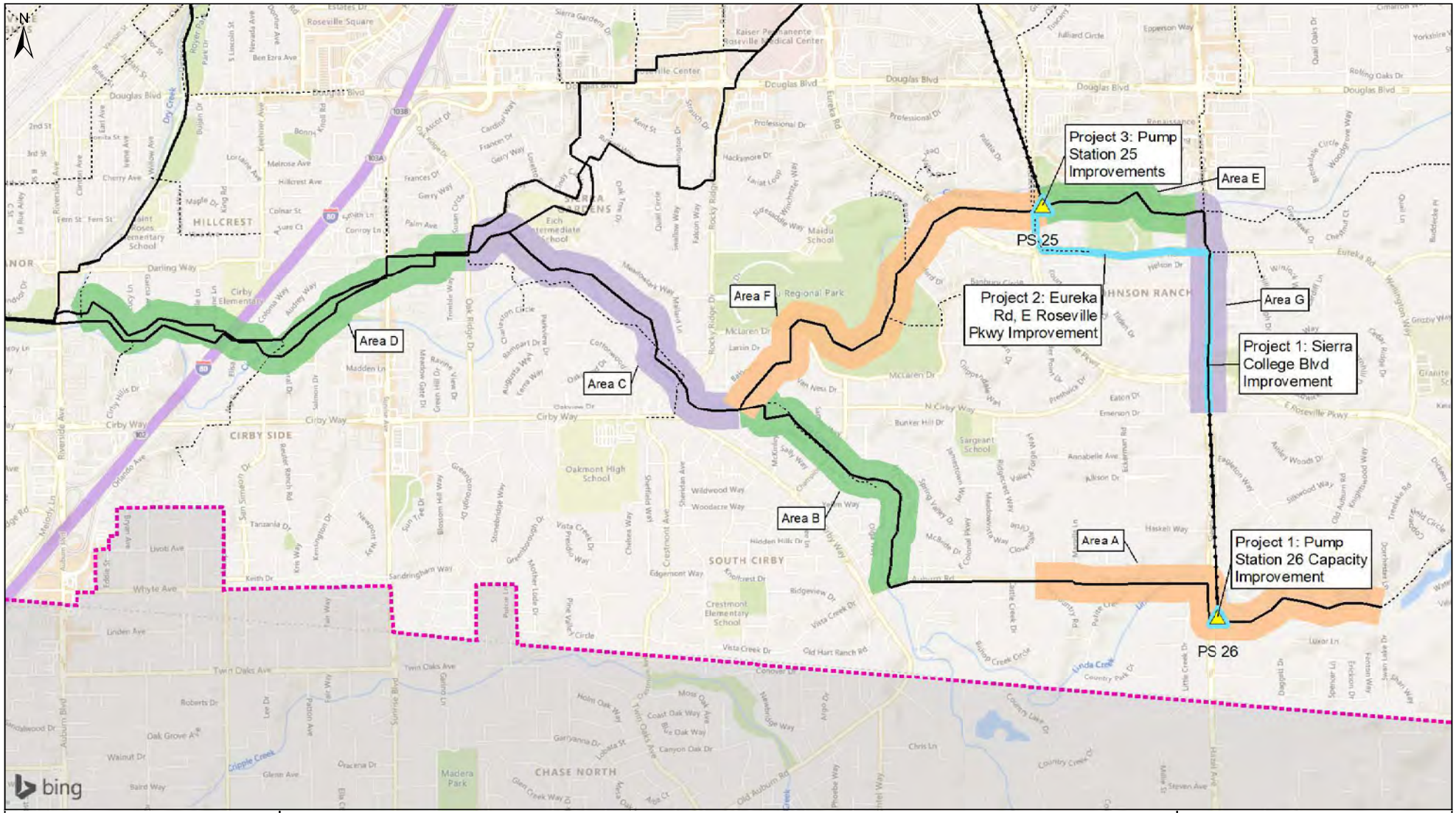


Figure ES-6
Proposed Improvement Locations

South Placer Wastewater Authority
2020 Systems Evaluation

0 0.125 0.25 0.5 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Pump Station
- Preliminary Capacity Improvement Area
- Deficiency Area
- Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

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Wastewater Treatment Plant Expansion Evaluation

Based on the updated growth projections provided by the SPWA partners, wastewater flow and loading (organic loading as measured by Biochemical Oxygen Demand, or BOD, and solids loading as measured by Total Suspended Solids, or TSS) projections were developed for the Dry Creek Wastewater Treatment Plant (DCWWTP) and Pleasant Grove Wastewater Treatment Plant (PGWWTP). The flow and loading projections were compared to the most recent evaluations of treatment plant capacity from 2009 for DCWWTP and from 2016 for PGWWTP. Projected shortfalls in hydraulic capacity or biological treatment capacity were identified and preliminary recommendations for expansion and upgrade projects were proposed. The recommendations address phasing, timing, and preliminary conceptual costs of the expansions required through buildout to address both flows and loads, as well as identifying next steps for confirming current plant capacity and refining expansion and upgrade projects.

Wastewater Flow and Loading Evaluation

Current influent flows and loadings for both plants were established by analyzing daily plant influent data provided by the City of Roseville for the period from January 1, 2016 through September 19, 2019 for influent flow and from January 1, 2013 through September 19, 2019 for wastewater loadings. Notably, the waste loadings for biochemical oxygen demand (BOD) over the past 6 years have been significantly higher than documented for prior studies and design projects. In previous studies, average BOD concentrations of 248 mg/L at DCWWTP and 285 mg/L at PGWWTP were documented. The 2013-2019 data set shows an average influent BOD concentration of 425 mg/L at DCWWTP and 358 mg/L at PGWWTP. These higher concentrations may be a result of water conservation efforts over the past decade combined with the drought conditions that were experienced throughout California from 2011-2016, but should be confirmed through additional testing. While TSS and nutrient loadings were also calculated, now that the Roseville WWTPs are addressing nutrient removal in their water quality strategies, the focus herein is on organic loading, as measured by BOD, because that is where the capacity constraints present themselves.

Projected flows were calculated based on population and non-residential growth, normalized to account for diversity in land uses by establishing equivalent dwelling units (EDUs). EDU projection data were provided by each of the SPWA partners. Flow projections were developed by multiplying the projected EDUs by an ADWF contribution of 190 gallons per day (gpd) per EDU, in accordance with the estimate developed in the 2009 Systems Evaluation (a conservative value used for regional treatment capacity planning).

The plant data show that current BOD loadings are higher than the BOD treatment capacities estimated in the prior reference documents for both plants. However, according to City staff, the plants have consistently been in compliance with their NPDES discharge permits. This suggests that the **actual** plant capacities are beyond their **nomina**l design capacity with respect to BOD. Additionally, it is unclear to what extent interim improvements such as the Nitrate Reduction Improvements project at DCWWTP have affected the plant capacity. For the purposes of this Systems Evaluation, it is assumed that the annual average BOD removal capacity at each plant is, at minimum, the same as the current BOD loadings. It is recommended that process-specific sampling, process modeling, and, if needed, stress testing be performed to determine the actual plant capacity, the limiting processes, and corresponding process improvements needed at each plant. While this evaluation will be immediately helpful at Pleasant Grove, it is immediately essential at Dry Creek because of the large discrepancy between current loading and nominal capacity.

The current and projected flows and loadings to the treatment plants are summarized in **Table ES-5** along with the treatment capacities based on current operating conditions. This comparison of current plant capacity and projected future flows and loads accounts for only hydraulic and carbonaceous BOD treatment capacity because these parameters have driven capacity expansion timing in the past (vs. TSS and nutrient treatment capacity). Potential nutrient removal requirements have not been considered in expansion timing and phasing. Evaluation of plant capacity with respect to TSS and nutrient removal should be incorporated into the subsequent analysis of plant capacity.

Table ES-5: Current and Projected Flows and Organic (BOD) Loadings

Parameter	Condition	Unit	Capacity			
				Current	FY59/60	Buildout
Dry Creek Wastewater Treatment Plant						
EDU		#		57,747	87,772	96,000
Flow	Average Dry Weather Flow	mgd	18	8.6	16.7	18.2
BOD	Annual Average Loading	lbs/day	33,900[1]	33,900	52,000	56,000
Pleasant Grove Wastewater Treatment Plant						
EDU		#		54,907	92,864	145,000
Flow	Average Dry Weather Flow	mgd	12[2]	7.6	17.6	27.6
BOD	Annual Average Loading	lbs/day	22,400[1]	22,400	38,000	60,000

Notes:

1. Current BOD loadings based on plant data from January 2013 through September 2019.
2. Plant improvements that expand treatment capacity at PGWWTP are currently under construction and are expected to be in service by FY 22-23.

Recommended Expansion Phasing

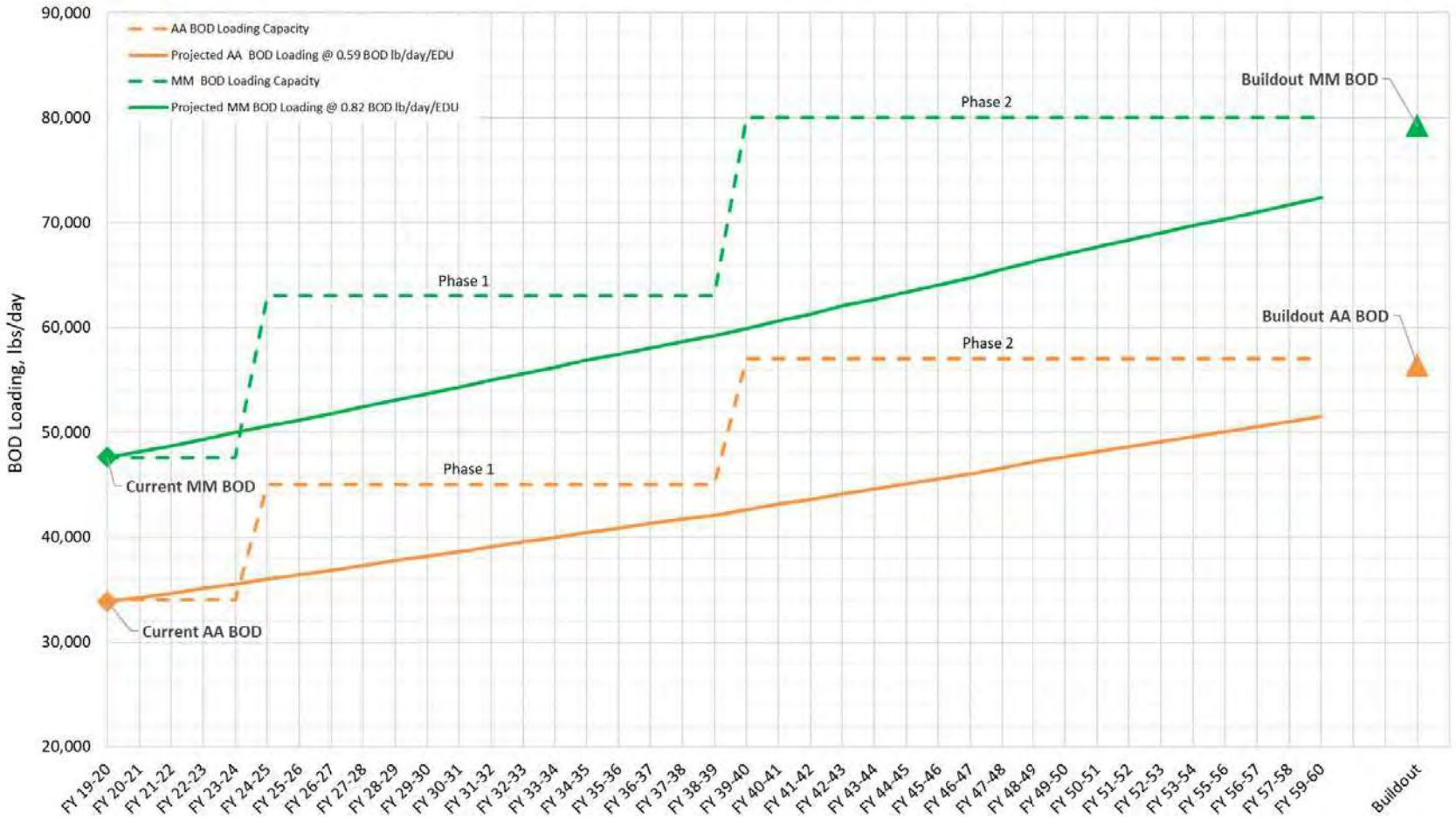
Prior to implementing any further improvements, it is recommended that process-specific sampling, process modeling, and if needed, stress testing be performed to determine the actual plant capacity, the limiting process, and corresponding process improvements needed at each plant.

Dry Creek Wastewater Treatment Plant. Based on the projected ADWF of 16.7 for FY 59/60 and 18.2 mgd for buildout, the current ADWF hydraulic capacity of 18 mgd is effectively sufficient through buildout. As shown in **Table ES-5**, DCWWTP appears to be currently running at or beyond its nominal design capacity with respect to BOD loading. **Figure ES-7** shows annual average (AA) and maximum monthly (MM) biological treatment capacities plotted against the loadings projected over the planning period and the anticipated expansion phasing. Depending on the results of the capacity testing, a Phase 1 expansion project may be necessary in approximately FY 24/25, which is the earliest practical time frame considering planning, design, and construction duration. The plant will reach 94% of the expanded Phase 1 AA and MM BOD loading capacity in FY 39/40. Therefore, it is recommended to implement Phase 2 biological improvements at this time. Phase 2 improvements in FY 39/40 are recommended to bring the plant BOD loading capacity to its buildout AA and MM projections of 56,000 and 79,000 lbs/day, respectively. The timing and magnitude of the recommended projects should be refined after additional capacity analysis and facility planning is completed, as described in the 3rd paragraph in the Wastewater Flow and Loading Evaluation section above.

Pleasant Grove Wastewater Treatment Plant. The improvements currently under construction will expand PGWWTP's treatment capacity to 12 mgd by FY 22-23. Based on the ADWF projections, this capacity expansion should be sufficient to handle flows through FY 28-29, though timing would depend on whether any rebound in sewer flows occurs.. Based on current estimates of capacity, Phase 1 hydraulic expansion at PGWWTP may be needed by approximately FY 28-29 to expand the plant ADWF to 15 mgd. Phase 1 expansion would carry the PGWWTP through FY 40-41. At that point, Phase 2 improvements may be needed to increase the plant ADWF capacity to the FY 59/60 flow projections of 17.6 mgd. Figure ES-8 shows ADWF plotted against the flow projected over the planning period and the anticipated phasing for improvements.

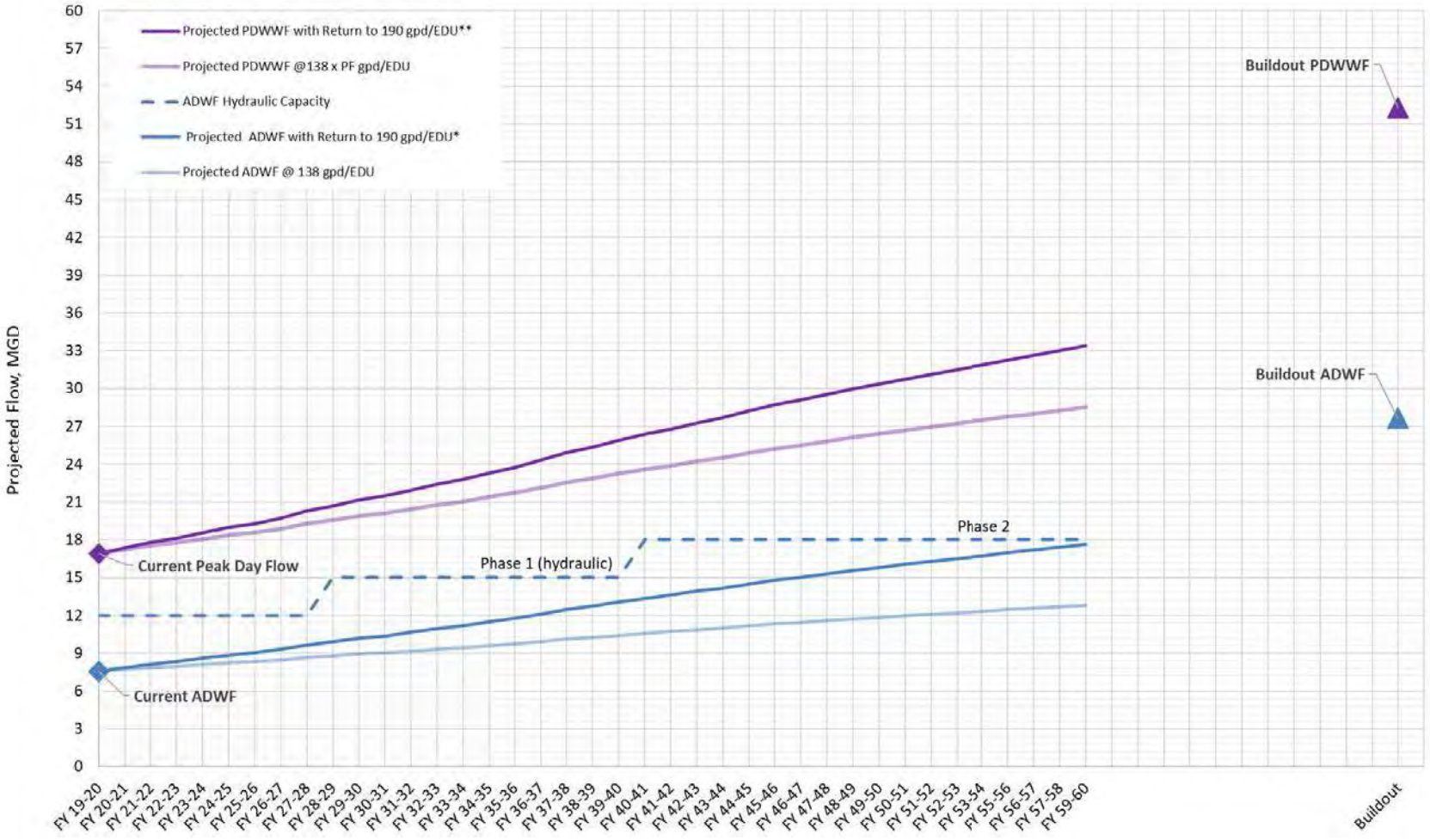
As shown in **Table ES-5**, PGWWTP is currently running at or beyond its nominal design capacity with respect to BOD loading. **Figure ES-9** shows AA and MM biological treatment capacities plotted against the loadings projected over the planning period and the anticipated expansion phasing. The improvements currently under construction will expand the plant's AA and MM BOD loading capacities to 34,500 lbs/day and 40,100 lbs/day, respectively. These improvements should be sufficient to meet projected BOD loadings through FY 40/41 when Phase 2 hydraulic capacity improvements are recommended at PGWWTP. During Phase 2 expansion, it is recommended that plant capacity be increased to accommodate projected FY59/60 AA and MM BOD loadings of 38,000 lbs/day and 48,000 lbs/day, respectively. The timing and magnitude of the recommended projects should be refined after additional capacity analysis and facility planning is completed, as described in the Wastewater Flow and Loading Evaluation section above.

Figure ES-7: DCWWTP Biological Capacity Comparison



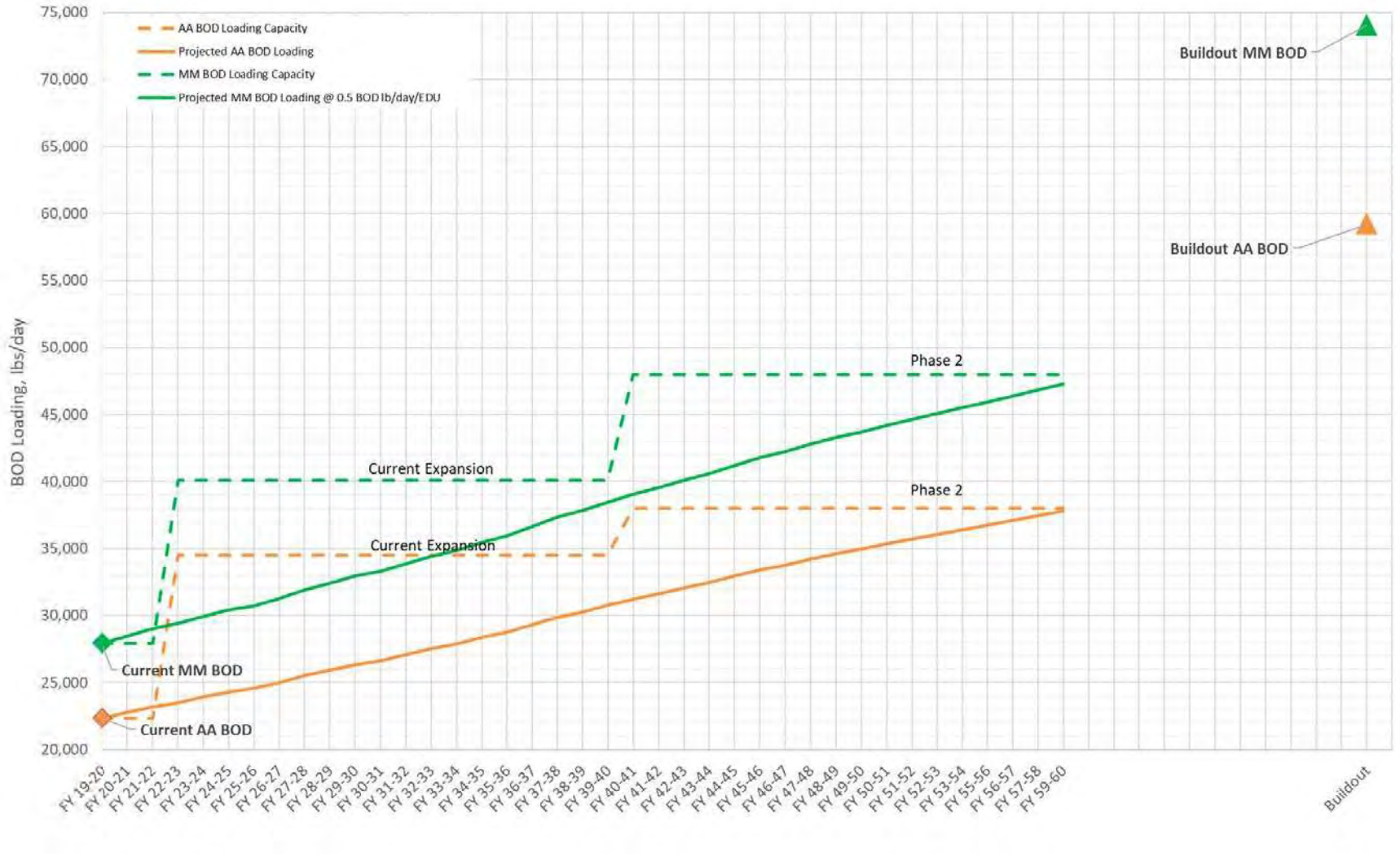
* Buildout date is currently unknown and is shown for graphical purposes only.

Figure ES-8: PGWWTP Hydraulic Capacity Comparison



* ADWF GPD/EDU factor is assumed to reach 190 gpd/EDU by FY 59/60, with a linear increase from 138 gpd/EDU at FY 19/20
**PDWWF is assumed to be ADWF flow plus 170 gpd/EDU of wet weather flow, based on current wet weather flowrates
*** Buildout date is currently unknown and is shown for graphical purposes only.

Figure ES-9: PGWWTP Biological Capacity Comparison



* Buildout date is currently unknown and is shown for graphical purposes only.

Conceptual Level Capital Cost Estimates

Preliminary opinions of probable cost at the conceptual level were developed for the recommended expansion phases. Estimates were developed by extrapolating from process unit cost estimates found in prior plant studies and applying appropriate escalation factors, allowances, and contingencies. Improvements that may be required after the FY 59/60 planning horizon have not been estimated.

Dry Creek Wastewater Treatment Plant. The preliminary phased improvements on a process basis are provided in **Table ES-6.** The listed improvements in Phase 1 (FY 24/25) will increase the AA BOD treatment capacity from 34,000 to 45,000 lbs/day (an equivalent increase in plant ADWF capacity from 11.5 mgd to 14.5 mgd). In Phase 2 (FY 39/40), the improvements will increase the AA BOD treatment capacity from 45,000 to 57,000 lbs/day (an equivalent increase in plant ADWF capacity from 14.5 mgd to 18 mgd). It should be emphasized that the cost estimates provided below are conceptual level costs for capacity expansion projects and do not include rehabilitation and replacement projects or discretionary projects. More detailed cost estimating should be developed when the plant capacity is determined and phased improvement projects are updated accordingly.

Pleasant Grove Wastewater Treatment Plant. The preliminary phased improvements on a process basis are provided in **Table ES-7.** The recommended phased improvements in Phase 1 (FY 28-29) increase the plant ADWF capacity from 12 mgd to 15 mgd. Phase 2 improvements will increase the ADWF capacity from 15 mgd to 18 mgd and the AA BOD treatment capacity from 35,000 to 38,000 lbs per day. It should be emphasized that the cost estimates provided below are conceptual level costs for capacity expansion projects and do not include rehabilitation and replacement projects or discretionary projects. More detailed cost estimating should be developed when the plant capacity is determined, and phased improvement projects are updated accordingly.

Table ES-6: DCWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a]

Process	Process Unit Cost	Phase 1 FY 24/25	Phase 2 FY 39/40
		# of units	# of units
Coarse Screens	$280,000	-	1
Influent Pump Station	$2,000,000	-	1
Fine Screens	$170,000	2	1
Odor Control	$210,000	1	1
Grit Basins	$290,000	-	1
Primary Sedimentation	$3,400,000	-	2
Aeration Basins	$2,600,000	4	6
Blowers	$290,000	1	-
Mixed Liquor Return Pumps	$150,000	4	6
Rehab Existing Anoxic Zones	$290,000	1	
Secondary Clarifiers	$4,100,000	4	2
RAS/WAS Pump Station	$860,000	1	1
Tertiary Filtration	$730,000		2
Waste Backwash Pumps	$100,000		1
UV Disinfection	$2,100,000		1
Anaerobic Digesters	$3,300,000	1	1
Centrifuges	$650,000	2	
Cooling Units	$290,000		2
Total Unit Process Costs		$34,000,000	$43,000,000
Site Yard Piping & Mechanical (5%)		$1,700,000	$2,200,000
Site Electrical / I&C/SCADA (15%)		$5,100,000	$6,500,000
Site Civil (5%)		$1,700,000	$2,200,000
Subtotal of Direct Construction Costs		$43,000,000	$54,000,000
Mobilization/Demobilization (5%)		$2,200,000	$2,700,000
Contractor Overhead & Profit (20%)		$8,600,000	$10,800,000
Subtotal of Direct and Indirect Costs		$54,000,000	$68,000,000
Contingency (30%)		$16,000,000	$20,000,000
Total Estimated Construction Cost		$70,000,000	$88,000,000
Engineering, Permitting, CM, ESDC (25%)		$18,000,000	$22,000,000
Total Estimated Capital Cost		**$88,000,000**	**$110,000,000**

Notes:

a. Costs based on Average of SF and "20 Cities" ENR for April 2020: 12115

Table ES-7: PGWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a]

Process	Process Unit Cost	Phase 1 FY 24/25	Phase 2 FY 39/40
		# of units	# of units
Influent Pumps	$120,000	1	-
Grit Basins	$290,000	1	-
Fine Screens	$170,000	2	-
Primary Sedimentation	$3,400,000	-	1
Oxidation Ditches	$7,100,000	-	1
Secondary Clarifiers	$4,100,000	1	1
RAS/WAS Pump Station	$860,000	1	-
Tertiary Filtration	$730,000	2	1
UV Disinfection	$2,100,000	3	-
Thickeners Building Modification	$490,000	-	1
Digesters Building Modification	$490,000	-	1
Total		**$13,000,000**	**$16,000,000**
Site Yard Piping & Mechanical (5%)		$650,000	$800,000
Site Electrical / I&C/SCADA (15%)		$2,000,000	$2,400,000
Site Civil (5%)		$650,000	$800,000
Subtotal of Direct Costs		**$16,000,000**	**$20,000,000**
Mobilization/Demobilization (5%)		$800,000	$1,000,000
Contractor Overhead & Profit (20%)		$3,200,000	$4,000,000
Subtotal of Direct and Indirect Costs		$20,000,000	$25,000,000
Contingency (30%)		$6,000,000	$7,500,000
Total Estimated Construction Cost		$26,000,000	$33,000,000
Engineering, Permitting, CM, ESDC (25%)		$6,500,000	$8,300,000
Total Estimated Capital Cost		**$33,000,000**	**$41,000,000**

Notes:

a. Costs based on Average of SF and "20 Cities" ENR for April 2020: 12115

Capacity Improvement Project Summary

Table ES-8 summarizes the capacity improvements identified in this systems evaluation. Note that the improvement needs projected for Dry Creek and Pleasant Grove WWTPs are significantly larger and more expensive than the improvement projects projected for the collection system, but are based on limited available data. The estimated costs for Dry Creek WWTP are especially high because of the size and age of that plant; when it was designed, the organic loading in Roseville was far lower than when Pleasant Grove was designed; since the mid 2000's organic loading to both plants has continued to increase. Further studies, as described in the Wastewater Flow and Loadings Section should be undertaken for both treatment plants, and the capacity improvement projects should be refined based on those findings.

Table ES-8: Proposed Capacity Improvement Projects

		Existing	FY 24/25 or FY 28/29	FY 39/40	After FY 59/60
Collection System	**Description**	Improvement Project 1 (Increased Capacity of PS 26 and sewers on Sierra College Blvd)	None	None	Improvement Project 2 (Redirect flows from PS 26 and Sierra College Blvd down Eureka Road) Improvement Project 3 (Increased Firm capacity of PS 25 with diversion structure improvements)
	Estimated Capital Cost	$1,610,000	-	-	$2,590,000
Dry Creek WWTP	**Description**	Plant Capacity, Condition Assessment, and Facilities Plan	Phase 1 (Increase AA BOD Capacity to ~45,000 lbs/day)	Phase 2 (Increase AA BOD Capacity to ~57,000 lbs/day)	Phase 3: Increase BOD Capacity and Hydraulic Capacity (not estimated)
	Estimated Capital Cost	$550,000	$88,000,000	$110,000,000	Not Estimated
Pleasant Grove WWTP	**Description**	Plant Capacity, Condition Assessment, and Facilities Plan	Increase ADWF hydraulic capacity to 15 mgd	Increase ADWF hydraulic capacity to 18 mgd. Increase AA BOD Loading Capacity to 38,000 lbs/day	Phase 3: Increase BOD Capacity and Hydraulic Capacity (not estimated)
	Estimated Capital Cost	$450,000	$33,000,000	$41,000,000	Not Estimated

Next Steps

Based on the findings of this preliminary evaluation, and discussions with the project team the following next steps are recommended for consideration by SPWA:

- Conduct an analysis of process performance and current biological treatment and hydraulic capacity at both DCWWTP and PGWWTP. This will likely require process-specific sampling and development of calibrated process models. Biological treatment capacity should consider both BOD and nitrate plus nitrite permit limitations set forth within each plant's respective NPDES permit. Results of this study should determine a capacity rating for each unit process at the plant and the limiting processes. This analysis will provide a sound basis for the planning of new facilities and is integral to determining required future capital improvement projects during phased expansions. It is recommended that DCWWTP capacity analysis take precedence over PGWWTP considering DCWWTP appears to be currently operating beyond its nominal BOD removal capacity.

- Review previous condition assessment work conducted on the plant assets and perform additional assessment needed to identify and prioritize repair and replacement (R&R) projects. This effort would include a risk assessment to identify likelihood of failure and criticality of each asset. Results of this study would identify R&R projects which may need to be implemented prior to or concurrent with phased expansions.

- Based on the capacity analysis and R&R project planning, develop Facilities Plans for DCWWTP and PGWWTP. Considering both plants could be running at or above their nominal design capacities, it is recommended that facilities planning begin immediately after the capacity analysis. This effort would evaluate various process optimization steps and upgrade alternatives and provide recommended improvements for phased expansions. The Facilities Plans would include review of the 190 gpd/EDU flow factor that is critical to the timing and magnitude of any hydraulic capacity improvements.

- Develop Class 4 cost estimates for recommended improvements at the WWTPs under each expansion phase and for R&R projects to assist SPWA partners in assessing capital needs in the future.

- For the collection system, periodically update the model network based on any configuration changes, perform re-calibration to confirm the actual and anticipated flows, and to update future loads into the model network. An update frequency of every 5-10 years is recommended, depending on changes in development planning and/or system configuration.

We also recommend that SPWA evaluate funding and financing options to support implementation of the recommended capital improvements, especially Phase 1 at Dry Creek given its size and relative immediacy. With the implementation of the steps above, and the ongoing high level performance of the SPWA Regional System, SPWA will be able to continue its excellent level of service to the Regional Partners.

1. INTRODUCTION

The South Placer Wastewater Authority (SPWA) was created under a Joint Powers Agreement in October 2000 and comprises the City of Roseville (City), South Placer Municipal Utility District (SPMUD), and the County of Placer (Placer County). Flow from SPMUD and portions of Placer County discharge into the City's sewer collection system. The City of Roseville, on behalf of the regional partners, owns and operates two regional wastewater treatment facilities: the Pleasant Grove Wastewater Treatment Plant (PGWWTP), and the older Dry Creek Wastewater Treatment Plant (DCWWTP). Additionally, the City of Roseville owns and operates the network of gravity sewers, pump stations, and force mains that serve customers within the City's limits, including the joint (regional) facilities that convey flow from the SPWA partners. SPMUD owns and operates gravity sewers, pump stations, and force mains in Rocklin, Loomis, and portions of southern Placer County. Placer County owns and operates gravity sewers, pump stations, and force mains in unincorporated areas of Placer County that are not served by other agencies.

Figure 1-1 shows the service area boundaries of the SPWA partner agencies and the overall SPWA service area. **Figure 1-1** also indicates the location of several Urban Growth Areas (UGAs), both inside and outside the City, which have significant development plans under varying stages of progress.

The South Placer Regional Wastewater and Recycled Water Systems Evaluation prepared in 2009 (2009 Systems Evaluation), defined the SPWA service area boundary; evaluated the wastewater collection, wastewater treatment, and recycled water distribution systems; and identified existing and potential future improvement needs. Since that study was completed, the recycled water distribution system has been removed from the SPWA system (reallocated as an asset) and is now wholly managed by the City of Roseville. SPWA is now updating the Systems Evaluation to better evaluate future wastewater collection and treatment capacity needs that may have changed since 2009. This report documents the evaluation of the regional wastewater collection system capacity and the capacity of the wastewater treatment plants versus projected flows and loads.

1.1 Objectives of the Systems Evaluation

The specific need for this Systems Evaluation was precipitated by several factors, including:

- Recent annexations of land by SPWA partner agencies;
- Changes in water consumption rates and associated dry weather flow rates;
- Planned development and redevelopment within the 2005 SPWA service area;
- Revisions in the planning for proposed Urban Growth Areas (UGAs) in the vicinity of the 2005 SPWA service area;
- Wastewater characteristics (i.e., flow and strength) that have changed since the 2009 Systems Evaluation.

This South Placer Regional Wastewater Systems Evaluation (Systems Evaluation) has been conducted to accomplish the following:

- Document the existing (2020) capacity and the flows and loadings on regional trunk sewer and wastewater treatment infrastructure and facilities present in 2020;
- Project buildout conditions based upon regional planning documents and planned regional developments in southwestern Placer County; and,
- Present a Regional Systems evaluation, with system deficiencies identified, and capital projects forecasted, which will inform the SPWA partners in identifying their ability to provide service for planned and proposed development, both presently and for buildout conditions.

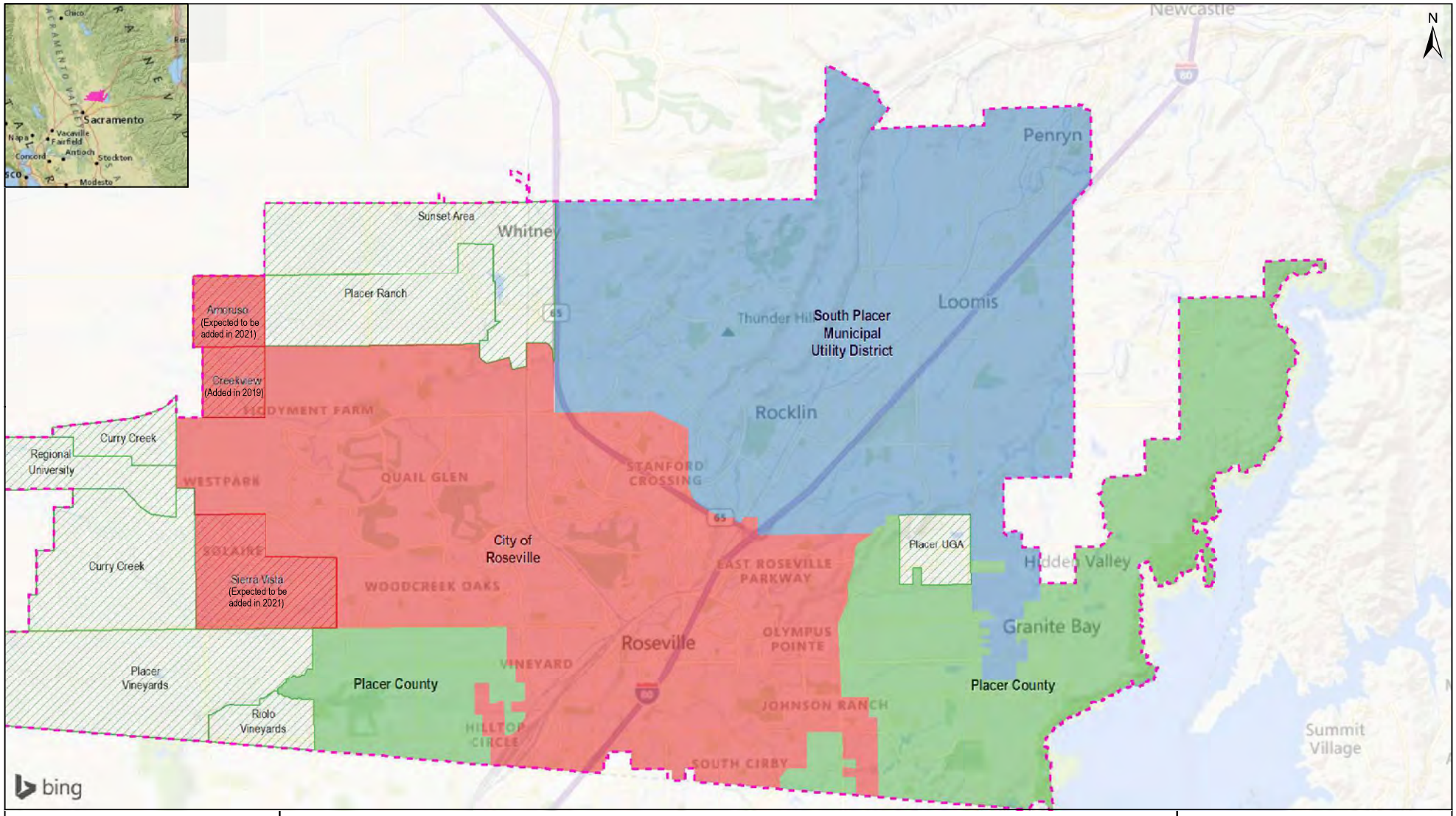


Figure 1-1
2021 Service Area Boundary

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

2021 Partner Agency Service Area
- City of Roseville
- Placer County
- SPMUD

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanjlanden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\1-1_SPWA_Service_Area.mxd

1.2 Project Scope

The scope of the Systems Evaluation, as well as a brief discussion of work conducted under each task, is described below.

- **Task 1 – Project Management.**

  Periodic progress meetings were held with City staff to review project status and discuss project issues, and monthly status reports were prepared to document the work completed.

- **Task 2 – Data Collection and Review.**

  This task involved assembling, organizing, and reviewing information and data related to the sewer system, including previous reports; maps and drawings of sewer system facilities and recent sewer improvement projects; water use and customer account data; the City's General Plan and other relevant planning information; and sewer design standards and specifications. This task also included meetings with City Planning staff, Placer County and SPMUD to confirm growth and future land use assumptions within the City of Roseville as well as from the SPWA partners outside the City.

- **Task 3 – Flow Monitoring.**

  A plan for flow and rainfall monitoring in the collection system during the 2015/16 wet weather season was developed. The program included 30 temporary flow meters (including 5 meters authorized by Task 5) and two rain gauges installed for a period of approximately two months (mid-January through mid-March). Gauge adjusted radar rainfall (GARR) data was also obtained for the rainfall periods. The monitoring was conducted by Woodard & Curran's subconsultant, V&A Consulting Engineers, and the GARR data was provided by OneRain, Inc.

- **Task 4 – Model Update and Calibration.**

  A hydraulic model of the City's trunk sewer system was developed using InfoWorks™ ICM software. The model network was developed using as-builts, the City's GIS data, and information from the 2005 Model Development Project. Flow loads to the model were compiled using water use and land use data and flow factors representing unit base wastewater flow (BWF) rates, diurnal BWF patterns, and infiltration/inflow (I/I). The model was calibrated for dry and wet weather conditions using the flow monitoring data collected under Task 2.

- **Task 5 – Update Flow Projections.**

  Based on data collected under Task 2 and discussions with SPWA and partner agencies' staff, existing and projected flows were developed. As part of this task, the best available planning information was collected and documented, including plans for Urban Growth Areas and parcel based data within the agencies' current service areas. A database of parcel-based projections within the SPMUD and Placer County Service areas was also prepared in this task. This information was used to estimate future flows and potential capacity needs.

- **Task 6 – Trunk Sewer Evaluation**

  In this task, the existing trunk sewers were evaluated against hydraulic performance criteria under the design storm conditions identified for the 2009 System Evaluation. Using the calibrated model and the selected design storm, existing and future model runs were performed to identify capacity deficiencies in the trunk sewer system. For those deficiencies, capacity improvement projects were developed.

- **Task 7 – Wastewater Treatment Plant Expansion Evaluations**

Based on the flow projections developed in Task 5 and buildout timeline information provided by City of Roseville, Placer County, and SPMUD, design flows and biological loading for both the Dry Creek and Pleasant Grove Wastewater Treatment Plants were developed. Based on these design flows and work completed by the City of Roseville, phased WWTP capacity expansions were identified considering current and future changes in regulatory requirements, and preliminary cost estimates were developed.

- **Task 8 – Prepare Systems Evaluation**

  This report was prepared to summarize and present the results and recommendations of the study.

1.3 Report Organization

This report includes five chapters, which are described below

- **Chapter 1, Introduction,** presents the background, objectives, and scope of the System Evaluation.
- **Chapter 2, Modeled Flow Projections,** discusses the service area land use projections, the basis for developing estimates for each component of wastewater flows, and the base wastewater flow projections for the service area.
- **Chapter 3, Trunk Sewer Evaluation,** describes the modeled trunk sewer system, development of the model network and model loads, flow monitoring program, and model calibration. This chapter also identifies the results of the capacity analysis, including preliminary solutions for the identified capacity deficiencies.
- **Chapter 4, Wastewater Treatment System Evaluation,** summarizes the wastewater treatment upgrade and expansion analyses performed for the Systems Evaluation, including the development of flow and loading peaking factors, facility expansion recommendations to handle projected flows and loadings at buildout, and a timeline for phasing the construction of the improvements.
- **Chapter 5, Capacity Improvement Summary,** summarizes the recommended capacity improvements, including project costs, phasing, and implementation recommendations.

2. BASIS OF FLOW PROJECTIONS

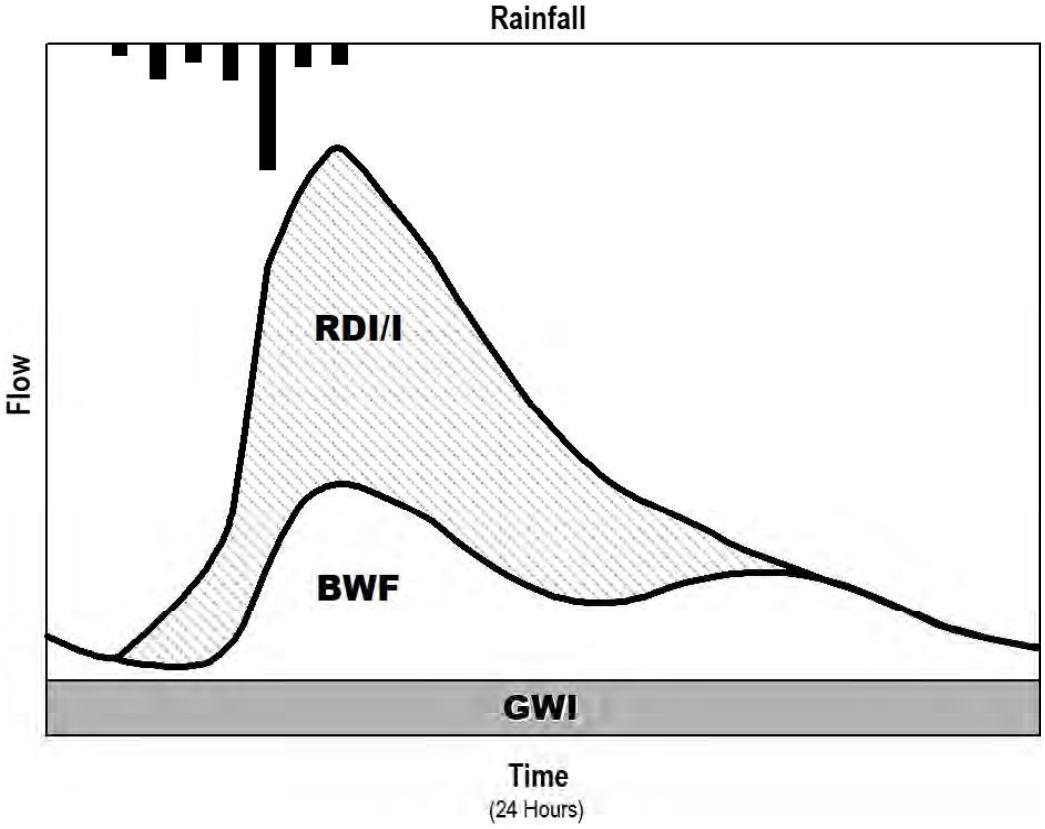
2.1 Introduction

The flow projections developed for this Systems Evaluation were based on the information collected for the system's hydraulic model updates, including the updates performed for the current study. In 2007, a hydraulic model of the City's sewer collection system was developed using the H2OMap Sewer modeling platform (2007 Model Development Project), in parallel with a trunk sewer model for the combined Roseville, SPMUD, and Placer County systems. The models were later updated as part of the 2009 Systems Evaluation. Subsequently, the City's sewer model was updated in 2017 to reflect existing and future demands within the City, and to upgrade the modeling platform to the fully dynamic InfoWorks ICM software. For the current Systems Evaluation Update, the City's model was updated to reflect existing and future projected flows from Placer County and SPMUD.

This section describes the flow components used in the hydraulic model and the existing and projected future land uses for the service area, which form the basis for generating base wastewater flows, in the current hydraulic model. Note that flow projections (referred herein as loads) are intended to represent the level of development present during the flow monitoring periods used to calibrate the hydraulic model. Design flow estimates were developed based on criteria developed for each component of wastewater flows: base wastewater flow (BWF), groundwater infiltration (GWI), and rainfall-dependent infiltration and inflow (RDI/I), and confirmed through model calibration, as described in Chapter 3. Average dry weather flow (ADWF) projections for each treatment plant area discussed in the Wastewater Treatment Plant Expansion Evaluations TM.

The three components of wastewater flows are illustrated conceptually in **Figure 2-1**. BWF represents the sanitary and process flow contributions from residential, commercial, institutional, and industrial users of the system. GWI is groundwater that infiltrates into defects in sewer pipes and manholes, particularly in winter and springtime in low-lying areas. GWI is typically seasonal in nature and remains relatively constant during specific periods of the year. ADWF represents the average flows at each WWTP from July to September. The source of these flows is a combination of BWF and GWI. RDI/I is storm water inflow and infiltration that enter the system in direct response to rainfall events, through direct connections such as holes in manhole covers or illegally connected roof leaders or area drains, or, more commonly, through defects in sewer pipes, manholes, and service laterals. RDI/I typically results in short term peak flows that recede quickly after the rainfall ends.

Figure 2-1: Wastewater Flow Components
(Not to scale)



2.2 Average Dry Weather Flow

ADWF has been estimated for four development scenarios: (1) Existing loads for model calibration; (2) Existing loads for capacity analysis; (3) Buildout; and (4) Buildout Sensitivity, which includes some additional densification and redevelopment assumptions based on feedback from the SPWA partners. As part of this Systems Evaluation, a database of existing and future loads for each parcel in Placer County and SPMUD service areas has been developed and provided to the City. As noted above, ADWF includes two components: GWI and BWF.

In 2007, a hydraulic model of the City's sewer collection system was developed using the H2OMap Sewer modeling platform (2007 Model Development Project), in parallel with a trunk sewer model for the combined Roseville, SPMUD, and Placer County systems. The models were later updated as part of the 2009 Systems Evaluation. Subsequently, the City's sewer model was updated in 2017 to reflect existing and future demands within the City, and to upgrade the modeling platform to the fully dynamic InfoWorks ICM software. For the current Systems Evaluation Update, the City's model was updated to reflect existing and future projected flows from Placer County and SPMUD.

This section describes the flow projections and model development process used to evaluate the SPWA collection system (sewers conveying flows from more than one partner agency), as well as findings from that effort.

2.2.1 Diurnal Base Wastewater Flow Curves

BWF varies throughout the day in a typical way, generally peaking early in the morning in upstream sewers and later and less sharply in larger downstream sewers. Typical hourly peak flows from small residential areas tend to be about twice the average flow (or even higher for very small areas), whereas peak flows further downstream may be less than 1.5 times average flows due to flow attenuation in the collection system. Higher peaks can occur on atypical days of the year (e.g., on major holidays such as Thanksgiving or at halftime on Super Bowl Sunday).

For the current Systems Evaluation Update, typical diurnal profiles were developed for residential and commercial/industrial (non-residential) wastewater flow, for both weekend and weekday conditions. These hydraulic profiles are shown in **Figure 2-2** and **Figure 2-3.** The residential profiles were developed based on monitored flows for smaller, primarily residential meter areas and refined during calibration. Two non-residential profiles were developed to represent flow patterns from two different types of uses: commercial/retail pattern, and an industrial/professional pattern. For parcels inside the City, each non-residential parcel was assigned a non-residential diurnal profile according to the land use code in the parcel database; a summary of the diurnal profile assigned to each land use code is provided in Appendix A. For non-residential parcels in Placer County and SPMUD, the commercial/retail pattern was used.

For UGAs, the residential profile was used for all residential uses, and the retail/commercial diurnal profile was used for all non-residential and mixed use land uses.

Figure 2-2: Residential Diurnal Curves

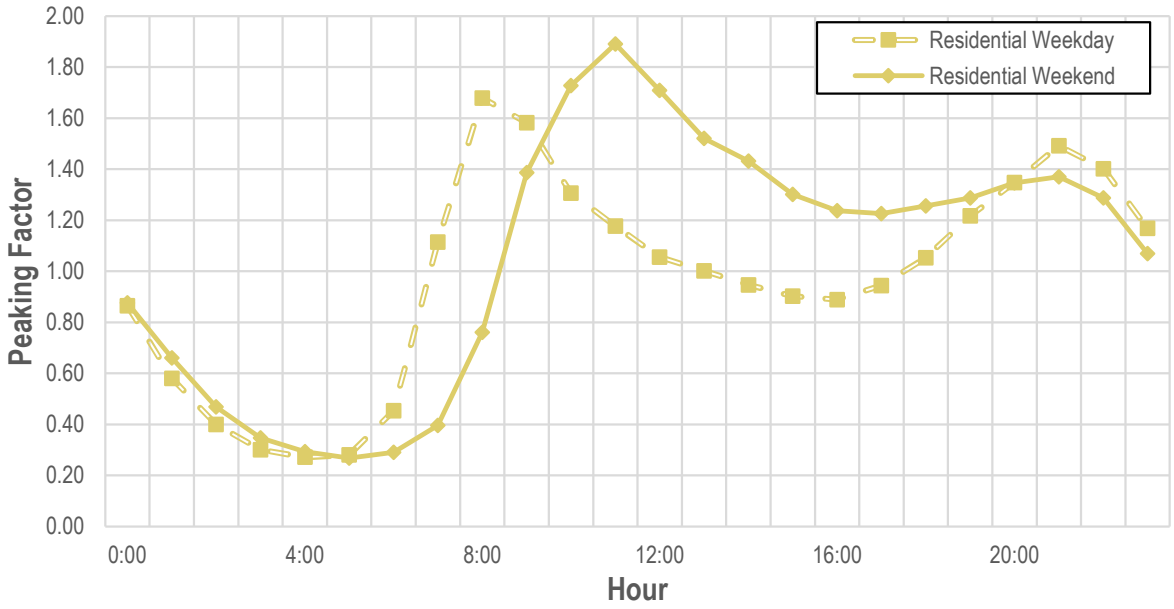
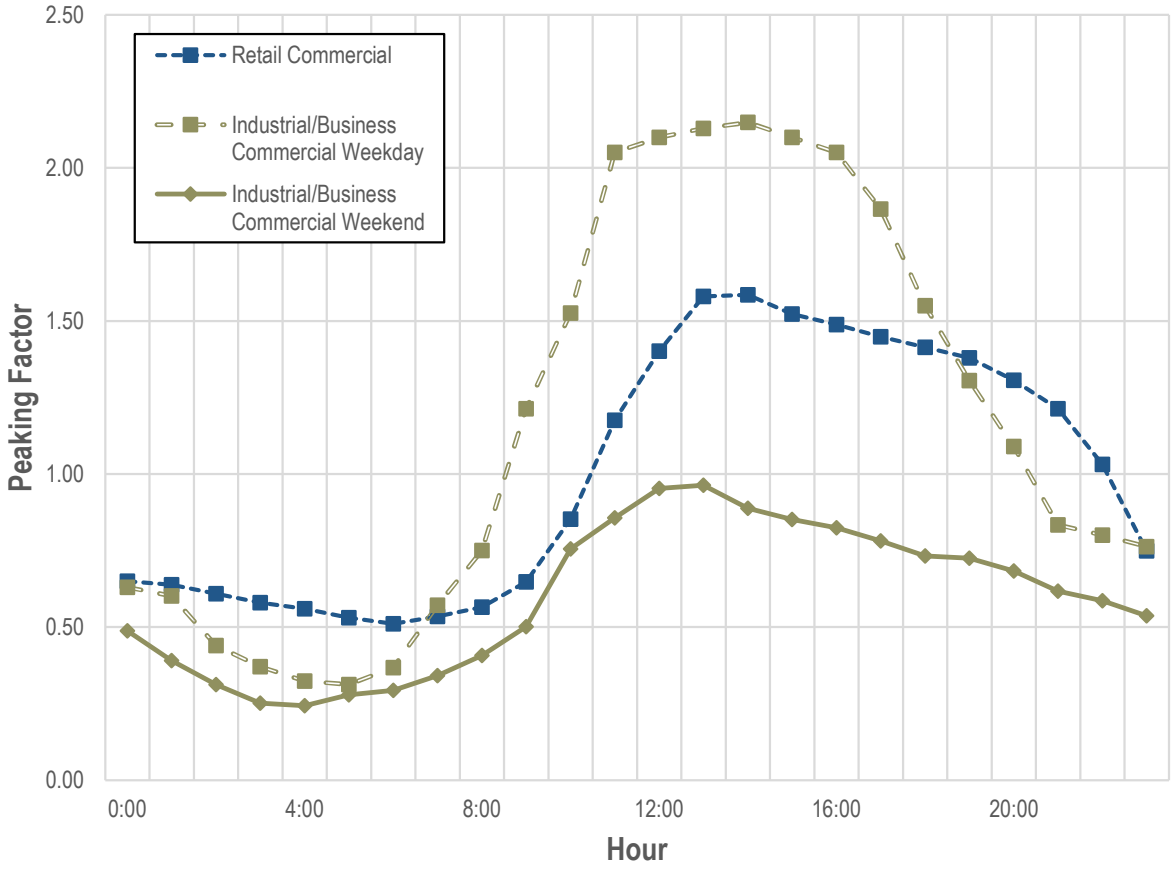


Figure 2-3: Non-Residential Diurnal Curves



2.2.2 Groundwater Infiltration

Groundwater infiltration is generally quantified based on actual flow monitoring data, since it is difficult to predict GWI rates based on physical system data alone. In the context of design flow criteria, GWI represents the incremental groundwater infiltration that occurs during the wet weather season above the "baseline" infiltration level during the driest months of the year.

GWI can be estimated based on minimum flows during non-rainfall periods within a wet weather flow monitoring period. Minimum flows typical occur during the nighttime or early morning hours when base wastewater flows are at a low. Alternatively, GWI can be estimated as the difference between average metered flow during non-rainfall periods and computed average BWF. In either case, the resulting GWI, is expressed on a unit basis (gpd/acre or gpad) by dividing by the sewered acreage of the monitored area. Typical GWI rates may range from 100 to over 1,000 gpad.

GWI flows for existing connected parcels were estimated through the model calibration process (see Chapter 3) by comparing model-simulated BWF to actual flow measurements from the temporary flow monitoring program. Cases where model-predicted BWF was noticeably lower than monitored flow indicated the possible occurrence of GWI.

2.2.3 Existing Base Wastewater Flows

Existing base wastewater flows were developed based on the assumptions summarized below; currently connected parcels are indicated in **Figure 2-4**. Note that loads are intended to represent the level of development present during the flow monitoring periods used to calibrate the hydraulic model.

2.2.3.1 City of Roseville

As noted previously, flows within City limits were estimated as part of the 2017 Sewer Model Update. As part of that study, existing residential and non-residential BWF within the City was determined based on water billing data provided by the City. The City has relatively complete water use records for all parcels within the City; billing data from December 2013 through April 2016 was provided for use in developing BWF estimates for the model. Metered water use during the winter months is assumed to most closely approximate wastewater generation, since outdoor water use is at a minimum. As data for the City of Roseville came from work done in 2016, existing BWF estimates for the City of Roseville represents 2016 land use.

December 2015 through March 2016 data was selected to represent winter water use, as it was generally wetter than prior years and therefore less irrigation was employed. This data also coincides with the flow monitoring period for the 2017 Sewer Model Update and should therefore correlate better with the recorded data during model calibration. It was assumed that all water use during these months was returned to the sewer; this assumption was validated during calibration. Note that the 2015/2016 wet season occurred after several years of drought. Therefore, water use levels may be lower than non-drought years due to conservation.

Where water use data was not available (limited portions of the City), sewer generation rates were estimated based on existing dwelling units indicated in the parcel database. For purposes of calibration, a single family rate of 160 gpd per DU and a multi-family rate of 120 gpd per DU were assumed, based on average rates from the December 2015 through March 2016 billing data. Using GIS processes, BWF loads from each parcel were then allocated to the nearest City sewer.

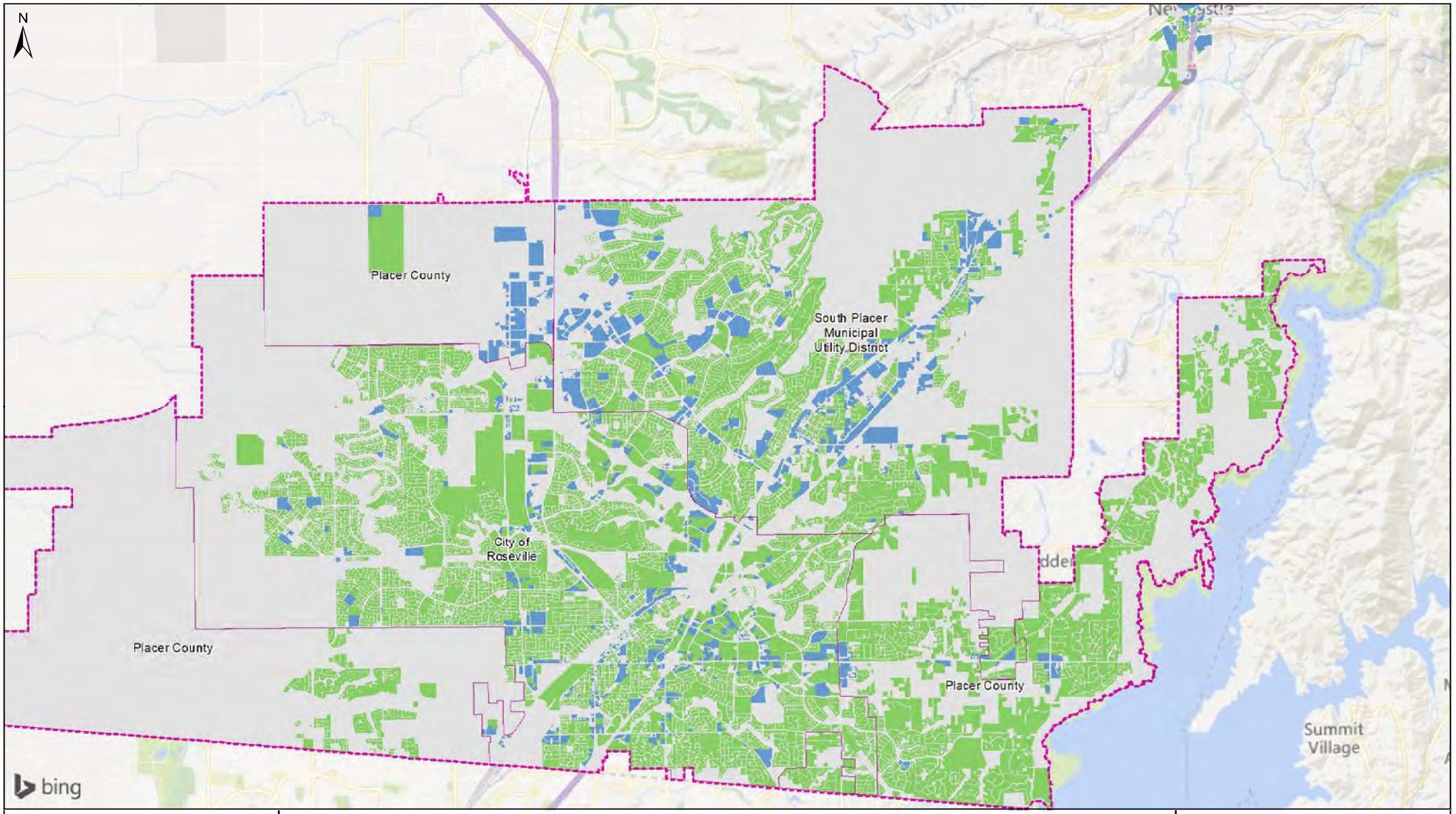


Figure 2-4

Existing[1] Connected Parcels

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Parcel Land Use

- Commercial/Industrial
- Residential
- Unconnected

- Service Area Boundary
- Partner Agency Boundary

1. "Existing" represents 2015/2016 connections within the City of Roseville and 2019 connections for Placer County and SPMUD.

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2.2.3.2 Placer County and SPMUD

Placer County provided spreadsheets summarizing equivalent dwelling units (EDUs) for each APN[1]. (Note: an EDU is defined as the flow equivalent of one single-family residence.) This dataset was then joined to a parcel dataset downloaded from the County website (downloaded March 20th, 2019), and then allocated to the nearest Placer County sewer. Since not all Placer County sewers are included in the model, GIS processes were used to identify the modeled manhole downstream of the parcel. All of the EDUs included in the spreadsheets were assigned to parcels and allocated to modeled manholes in this way. Each parcel was assigned either a residential or commercial loading pattern based on its general plan category as summarized in Appendix A.

SPMUD provided a shapefile[2] which provided EDUs for the year 2020 (which was identified as "existing" land use by SPMUD staff), an associated SPMUD manhole, and a type of use (residential or commercial) for each parcel. As for Placer County, GIS processes were used to identify the modeled manhole downstream of the parcel.

During calibration, a base wastewater flowrate of 160 gpd per EDU was typically applied, but this factor was adjusted down in some cases by 15 or 20 percent based on data from wastewater flow meters in the collection system.

2.2.3.3 Drought Rebound

The calibration period occurred during the third year of an ongoing drought. Billing data and flow records indicate a general decline in water use, likely due to the drought-induced conservation primarily limiting irrigation water use but also reducing indoor water use. Analysis of billing data indicates that on a per dwelling unit basis, water use was reduced by approximately 15 percent between 2014 and 2016. Therefore, for capacity analysis purposes of the existing system and for all future scenarios, it has been assumed that base wastewater flows within the City would increase by 15 percent.

For Placer County and SPMUD, BWF was increased to 180 gpd per EDU, which is consistent with the BWF assumptions used in the 2009 Systems Evaluation and is approximately a 15 percent increase compared to calibrated flow factors overall, though specific flow meter basins assume a higher rebound percentage (wherever the flowrate per EDU was decreased during calibration).

2.2.4 Future Average Dry Weather Flow

Future BWF from the City, SPMUD, and Placer County have been estimated for a Buildout scenario (representing likely future land use based on current data) as well as a Buildout-Sensitivity scenario (representing higher potential growth) using the factors summarized in **Table 2-1**. For consistency with WWTP flow projections, ADWF flow factors are used, which includes some dry season GWI.

The locations of future developments, including urban growth areas, are indicated in **Figure 2-5**, and discussed further in the next sections.

[1] Spreadsheets included: Existing dry creek EDU-7-24-19.xls, Existing SMD 2- EDU-2018-12-12.xlsx, Existing SMD 3- EDU-2018-12-12.xlsx, Existing Sunset EDU-7-24-19.xls

[2] SPMUD_SewerLoading_AddressPoints, provided August 7, 2019.

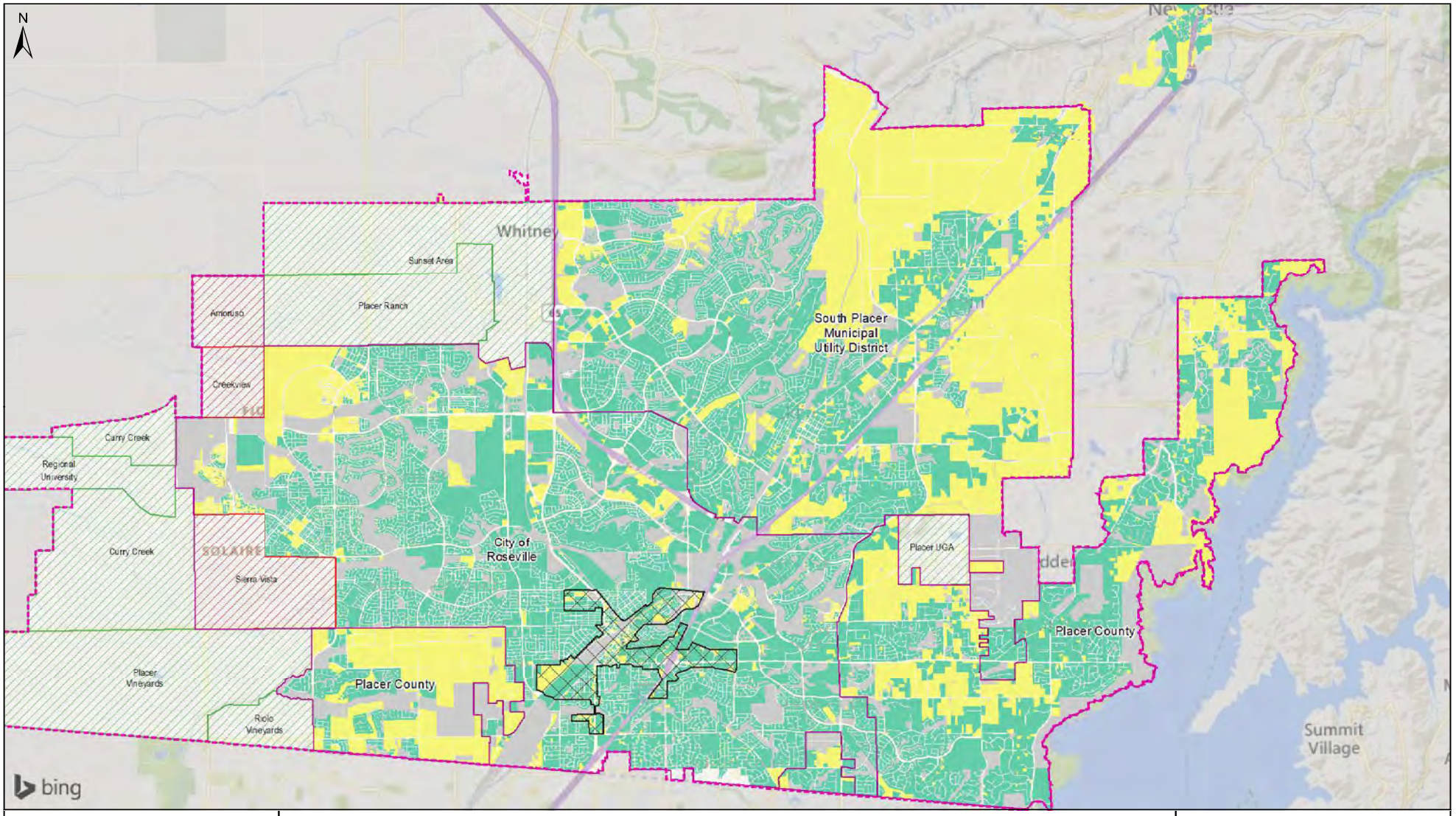


Figure 2-5
Future Development and Urban Growth Areas

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Buildout Status
- Existing
- Future Connection
- Unconnected
- Redevelopment Area

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Service Area Boundary

Partner Agency Boundary

Project #: 0011183.00
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Table 2-1: Average Dry Weather Flow Factors

Land Use Designation	Units	Unit Flow Factors [a]
Commercial	gpd per acre	850
Heavy Industrial	gpd per acre	850
Light Industrial	gpd per acre	850
Mixed Use	gpd per acre	2,300
Public/Quasi-Public	gpd per acre	660
Schools	gpd per acre	170
Residential Single DU (or EDU)	gpd per du	190
Residential Mult. DU [b]	gpd per acre	2,040
Parks > 10 Acres	gpd per acre	10
Vacant/Open Space	gpd per acre	0

Notes:
a. Includes allowance for GWI.
b. The Residential Multiple DU unit flow factor can also be represented as 130 gpd per du

2.2.4.1 City of Roseville

For the City of Roseville, the Buildout scenario is based on infill of currently vacant parcels, using land use information from the City's General Plan or provided by the City's planning department, and development of the Sierra Vista, Creekview, and Amoruso UGAs. Sources of data included the following:

- Parcel data downloaded from the City's website (download dated 8/25/2016). The parcel data has the following fields that were used for to estimate future demands:
    - PotUnits: The total number of units allocated to the parcel, prior to any development. Once development beings, potential units is reduced to zero.
    - Undevunits: Once development commences, undeveloped units are the number of vacant lots in the subdivision that do not have a single family unit
    - PotArea: the total developable square footage of the parcel upon its creation. Once development begins, the area is reduced to zero.
    - UndevArea: Once development commences, if the parcel is not fully developed, the number refers to the remaining available square footage of land available to be developed
- The West Roseville Specific Plan (*West Roseville Specific Plan*, EIP Associates, dated February 4, 2004) was used to confirm future units within the West Roseville Specific Plan area.
- Land use data for several specific developments was provided by City Planning, where that data was likely to be more current and more detailed than available in the current GIS.

Infill locations are indicated in **Figure 2-5**.

2.2.4.1.1 Redevelopment (Buildout-Sensitivity Scenario)

The Buildout-Sensitivity scenario includes redevelopment of a portion of the City, as indicated in **Figure 2-5**. Redevelopment occurs where existing land uses are removed and replaced with new, typically more intensive land

uses (and associated sewer flows). Redevelopment land uses are based on parcel-based classifications developed for the 2009 Systems Evaluation. It was assumed that existing land uses for the parcels in the redevelopment area would be replaced by the land uses in the redevelopment plan. Overall, redevelopment results in an increase in ADWF of about 1.5 mgd from the Buildout Scenario. More detailed information on the redevelopment land uses inside the City is included in TM 9C of the 2009 Systems Evaluation.

2.2.4.2 Placer County and SPMUD

Placer County provided a spreadsheet that summarized the anticipated EDUs for all entitled projects in Placer County[1]. EDUs for other currently vacant parcels were estimated using general plan data[1]. Specifically, the general plan shapefile indicated a minimum and maximum density for each category; the categories used for this study, and the associated density and diurnal curve used are summarized in Appendix A. For the Buildout-Sensitivity scenario, Placer County staff suggested an assumption that 60 percent of parcels zoned for residential development would densify to 30 percent higher than the maximum density allowed in the general plan. GIS processes were used to allocate each parcel to the nearest Placer County sewer, and then associated with the modeled manhole downstream of the parcel.

The shapefile provided by SPMUD specified the EDUs in 2060 for each parcel, as well as an associated SPMUD manhole. As for assignment of existing loads, GIS processes were used to identify the modeled manhole downstream of the parcel.

Locations of future development in Placer County and SPMUD are indicated on **Figure 2-5.**

2.2.4.3 Urban Growth Areas

Several UGAs were identified in the 2009 Systems Evaluation and have been included in this evaluation. Locations of the UGAs are shown in **Figure 2-5**. Placer County UGAs include Placer Ranch, Sunset Area, Placer Vineyards, Regional University, Riolo Vineyards, and Curry Creek; the SMD-3 UGA has been incorporated into the current Service Area Boundary. UGAs within the City identified for included Sierra Vista, Creekview, and Amoruso; these UGAs either have already been added to the current Service Area Boundary or are expected to be added in early 2021 (as shown in Figure 1-1) but are included here for consistency with the City's 2017 Model Update. Land use and flow projections were based on the most recent wastewater master plans for each UGA, as indicated below. Flows associated with each UGA are summarized in **Table 2-2**. A more detailed summary of land uses for each UGA broken out by sewershed is included in Appendix B.

- Sierra Vista (*Sierra Vista Specific Plan Sanitary Sewer Master Plan*, Mackay & Somps Civil Engineers, July 2009)
- Creekview (*Creekview Specific Plan Sanitary Sewer Master Plan*, Mackay & Somps Civil Engineers, November 2010)
- Amoruso (*Amoruso Ranch Specific Plan Area Wastewater Master Plan*, Kimley Horn, September 2015)
- Placer Ranch (*Placer Ranch Sewer Master Plan,* Mackay & Somps, July 2017*)*

[1] 2018-12-18-Entitled-Planned Project.xlsx (provided December, 2018) and GeneralPlans_CommPlans.shp (downloaded from Placer County website, dated October 20, 2019)

- Sunset Area (*Sunset Area Water, Wastewater, and Recycled Water Technical Report,* Psomas, October 2017)
- Placer Vineyards (*Placer Vineyards Specific Plan; Sanitary Sewer Master Plan Addendum 1,* Mackay & Somps, May 2019)
- Regional University (*Regional University Specific Plan, Sanitary Sewer Demand*, Mackay & Somps, September 1, 2017)
- Riolo Vineyards (*Riolo Vineyards Sanitary Sewer Master Plan Update*, Unico Engineering, April 2016)
- Curry Creek (*2009 SPWA Systems Evaluation*, RMC Water & Environment, 2009). No current planning information is available for Curry Creek. Preliminary land use estimates were developed for the 2009 Systems Evaluation and used again for this evaluation.
- Placer UGA (*Hawk Homestead Sewer Analysis – Supplementary Information Requested by Placer County Environmental Engineering,* Derrick Whitehead, Municipal Consulting Group, January 29, 2016)

Table 2-2: ADWF from UGAs

UGA	Agency	WWTP	Total Area (ac)	Buildout ADWF (mgd)
Sierra Vista	Roseville	Pleasant Grove	2,064	1.83
Creekview	Roseville	Pleasant Grove	501	0.43
Amoruso[a]	Roseville	Pleasant Grove	694	0.61
Placer Ranch	Placer County	Pleasant Grove	2,213	2.15
Sunset Area[b]	Placer County	Pleasant Grove	2,888	3.80
Placer Vineyards	Placer County	Dry Creek	5,230	2.89
Regional University	Placer County	Pleasant Grove	1,159	1.17
Riolo Vineyards	Placer County	Pleasant Grove	879	0.23
Curry Creek	Placer County	Pleasant Grove	3,212	2.74
Placer UGA	Placer County	Pleasant Grove	617	0.04

Notes:
a. Includes 274 units north of Amoruso that would contribute flow through sewers in Amoruso (Toad Hill)
b. Does not include the Placer Ranch subset of the Sunset Area Plan

2.2.5 Dry Weather Flow Summary

Existing and Projected Future Dry Weather Flows are summarized in **Table 2-3**. Note that these estimates include wet season GWI, which may be higher than dry season GWI.

Table 2-3: Estimated Dry Weather Flows[a] by Agency

WWTP	Agency	Existing Calibration ADWF (mgd)	Existing ADWF with Drought Rebound	Buildout ADWF (mgd)	Buildout-Sensitivity[b] ADWF (mgd)
Pleasant Grove	Roseville	5.87	6.70	13.01	13.04
	Placer County	0.18	0.20	9.85	9.85
	SPMUD	2.25	2.97	3.63	3.63
	Total	**8.30**	**9.87**	**26.49**	**26.52**
Dry Creek	Roseville	5.60	6.27	6.89	8.23
	Placer County	2.57	2.81	7.19	7.42
	SPMUD	2.90	3.64	5.16	5.16
	Total	**11.06**	**12.72**	**19.24**	**20.81**

Notes:

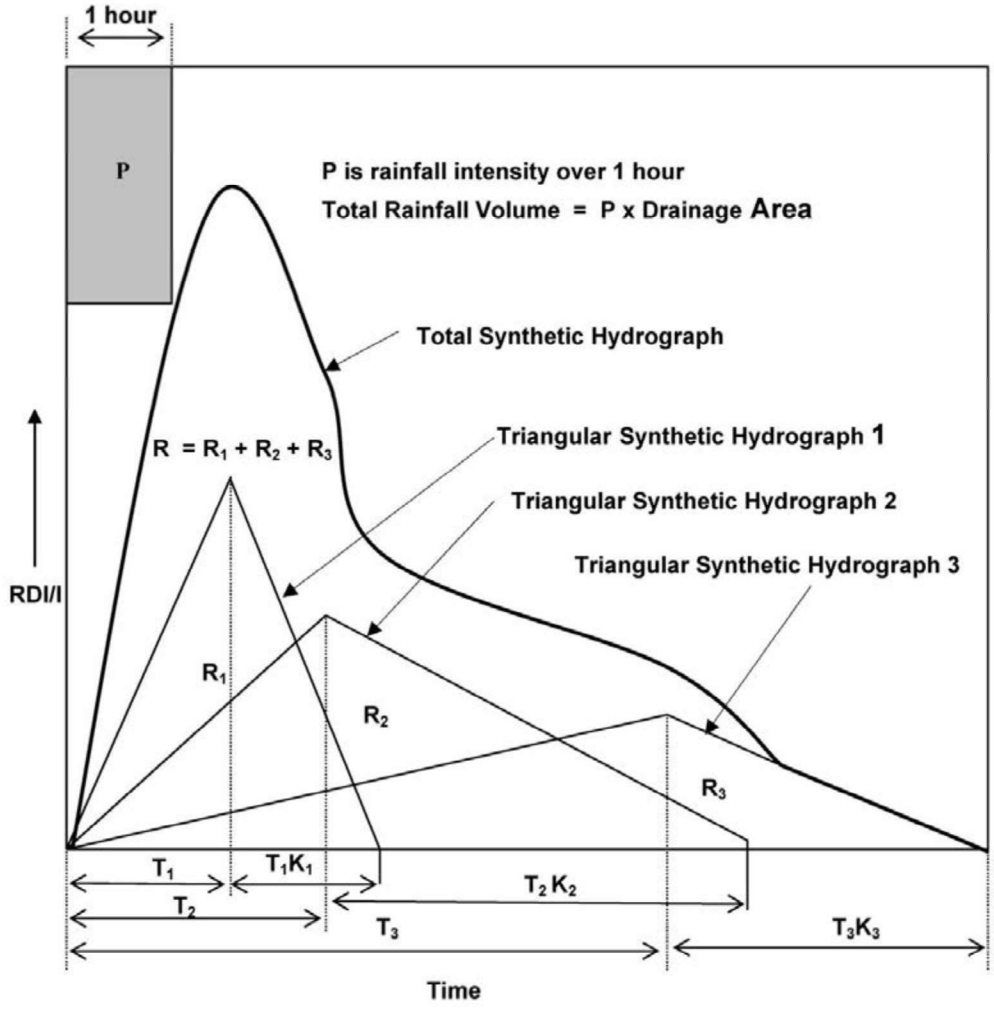
a. Includes wet season GWI.

b. For the Buildout-Sensitivity scenario, the development density was assumed to be at the maximum range allowed by the General Plan. A Base Wastewater Flowrate (BWF) of 180 gpd per EDU was assumed for Placer County and SPMUD.

2.3 Rainfall-Dependent Infiltration and Inflow

RDI/I flows result from rainfall events that produce infiltration and inflow of storm water runoff into the sewer system. RDI/I flows are defined by the magnitude, shape, and timing of the RDI/I response. RDI/I varies depending on many factors, including the magnitude and intensity of the storm event, area topography, type of soil, and the condition of the sewers, manholes, and sewer service laterals. In a dynamic model, RDI/I is typically computed as a percentage of the rainfall (sometimes referred to as the "R value") falling on the contributing area of a subcatchment for each of three or more hydrograph components, representing different response times to rainfall, e.g., fast, medium, and slow, as illustrated in **Figure 2-6**. The contributing area is assumed to be the sum of the area of all developed parcels, except for large open areas such as parks and parking lots. Summing all of the component hydrographs for the entire duration of the rainfall event results in the total RDI/I hydrograph for the event for that subcatchment. Note that although the "slow" RDI/I component can contribute significantly to the total RDI/I volume, the "fast" component has the biggest impact on the magnitude of the peak wet weather flow.

Figure 2-6: RDI/I Hydrograph Components



3. TRUNK SEWER EVALUATION

3.1 Introduction

This section describes the hydraulic analysis and design criteria used to evaluate system performance and size capacity relief projects in the trunk sewer system and identifies the capacity deficiencies based on the results of model runs.

3.2 Model Network Development

This section describes the development of the hydraulic model used for the capacity assessment of the SPWA trunk sewers. The modeling software used for this study was InfoWorks ICM by Innovyze, a fully dynamic hydraulic modeling program that has been used for many other collection systems in California, including Sacramento Area Sewer District, Regional San, and the City of Folsom. This section provides an overview of the model development process, including description of the modeled sewer network, the flow monitoring program, and the calibration of the model.

3.2.1 Modeling Terminology

Key modeling terms are defined below.

- **Network** refers to the representation of the physical facilities being modeled. Modeled network components include pipes, manholes, and pump stations.
- **Nodes** are primarily manholes, but also include pump station wet wells and outfalls (discharge points from the modeled system). Key data associated with nodes include manhole ground elevations and pump station wet well elevations and cross-sectional areas.
- **Pipes** or **conduits** are connections (links) between nodes, and include both gravity sewers, force mains and conduits. Key data associated with pipes are upstream and downstream node IDs, pipe length, diameter, roughness factor, and upstream and downstream invert elevations.
- **Pumps, gates, and overflow weirs** are represented in the model as links between nodes. Data associated with these facilities depend on the structure type. For example, data for weirs include width, elevation, and weir discharge coefficient.
- **Subcatchments** are areas that contribute flow to the modeled sewer network. They may represent parcels, or an area comprised of multiple parcels that are collected by unmodeled sewers in the collection system (sewershed). Data associated with subcatchments include BWF (computed based on population, water use, or other available data), type of diurnal BWF profile (which is a function of land use), I/I parameters, and the node at which the flow from the subcatchment enters the modeled system.
- **Model loads** are the flows entering the modeled sewer system from each subcatchment. Model loads include residential and commercial sanitary or BWF, GWI, and RDI/I. As a sum, they represent the total wastewater flow applied to the model.
- **Models** are the combination of a modeled network, its associated subcatchments and loads, and other data (e.g., rainfall, diurnal profiles, inflows from other areas, etc.) that comprise a specific model scenario.

3.2.2 Modeled System

The model network for this Systems Evaluation included trunk sewers from the City's model, as well as selected pipe reaches in SPMUD and Placer County. The extent of the modeled sewers in SPMUD and Placer County is consistent with the extent used in the 2009 Systems Evaluation, and generally includes 15-inch and larger trunk sewers. The existing modeled network is shown in **Figure 3-1**. **Figure 3-1** also highlights the trunk sewers within Roseville that convey flow from multiple SPWA partners and are the focus of the capacity analysis.

As noted previously, the model network was based on the model developed for the City's 2017 Sewer Model Update. For the trunk sewers in that model update, the City's GIS data was updated with rim and invert elevation data extracted from record drawings or, in some cases, ground elevation data from other datasets. In a few cases (e.g. at all flow splits) additional data was collected through survey or field inspection by City staff.

For the current Systems Evaluation Update, that model was extended into Placer County and SPMUD service areas to provide a more complete analysis of the regional trunk sewer system. GIS data provided by Placer County and SPMUD was used as the basis for extending the network into their respective systems. The model extent was limited to the extent used for the 2009 Systems Evaluation, but generally includes most 15-inch and larger sewers, as well as selected smaller diameter sewers. A model validation process was undertaken, similar to the process used in the City's 2017 Sewer Model Update.

Model validation generally includes the following:

- **Connectivity checks.** The modeled networks were checked for connectivity, which includes verifying that correct upstream/downstream manholes were identified for each pipe, with no missing links or nodes in the network. A connected network means that all pipes and manholes will be selected when the network is traced upstream from the model outfalls.
- **Missing data checks.** Key data required for modeling were reviewed to identify missing values. Missing data were inferred where reasonable (e.g., where one or two invert elevations were missing between populated values, the data could be interpolated), or populated based on data from the 2009 Systems Evaluation.
- **Profile review.** Profiles were plotted for each series of pipe segments in the modeled network to visually check for suspect data. Examples of suspect data include negative pipe slopes, abrupt steps up or down in pipe inverts, and pipe diameters that conflict with surrounding pipes. Where appropriate, corrections to suspect data were inferred. Otherwise, verification in the form of as-built drawings or field investigations were requested.
- **Special structures.** Flow splits (manholes with more than one outlet pipe) were identified for further verification of outlet pipe elevations and/or the existence of weir overflows or other control structures. Field verification and/or as-built drawings were requested as needed.

In all, the model includes approximately 83 miles of gravity trunk sewers, of which about 32 miles are considered SPWA facilities. All gravity pipelines are modeled assuming a Manning's n of 0.013.

The modeled system includes two pump stations that can convey regional flows as summarized in **Table 3-1**. PS 25 and PS 26 were designed to operate during high wet weather conditions by transferring flow between trunk sewers, thereby alleviating downstream capacity issues. Flow enters the pump station wet well when surcharge conditions in the adjacent gravity sewer overtops an associated weir. PS 25 is designed to limit surcharging in the trunk sewer on Old Auburn Road and conveys flows (mostly originating in Placer County) north towards the 21-inch trunk sewer downstream of Placer County's Sierra College Meter. PS 26 is designed to limit surcharging in that 21-inch easement sewer by conveying flows further north on East Roseville Parkway. City operations staff note that PS 26 is used regularly during wet weather conditions, but PS 25 has not been used in a number of years.

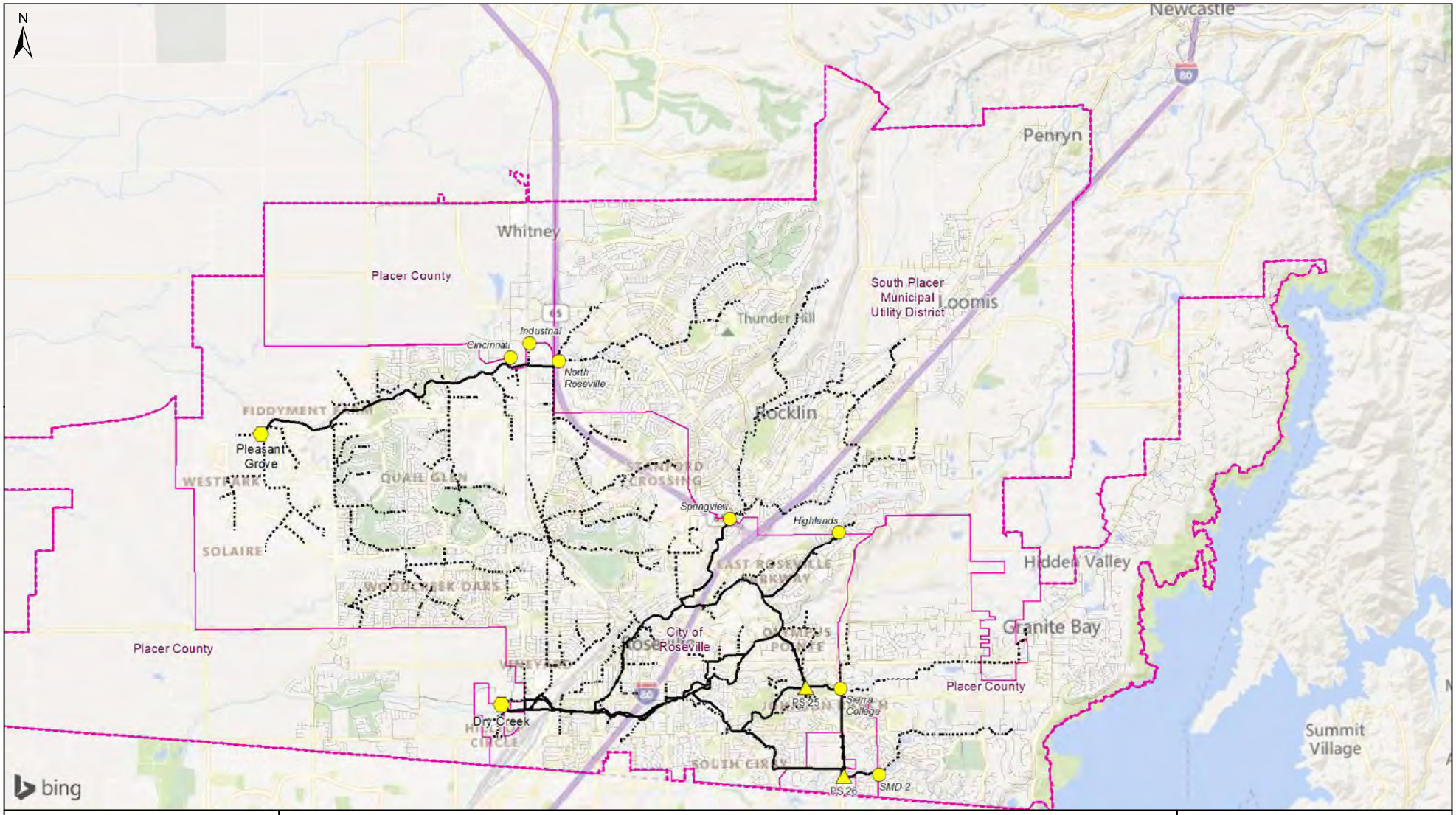


Figure 3-1
Modeled Trunk System

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

- Regional Gravity Sewer
- Regional Force Main
- Non-Regional Modeled Sewer
- Non-Modeled Sewer
- Wastewater Treatment Plant
- Pump Station
- Permanent Flow Meters
- Partner Agency Boundary
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

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Placer ROSEVILLE

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Table 3-1: Regional Pump Station Facilities

Pump Station	No. of Pumps	Firm Capacity[a] (mgd)	Total Capacity (mgd)	Force Main Dia. (in.)
PS 25[b] (Johnson Ranch)	2	2.02	3.20	12
PS 26 (Old Auburn)	2	0.43	0.68	8

Notes:

a. Capacity with one pump out of service.
b. Capacity of PS 25 is based on information collected as part of the 2009 Systems Evaluation. Capacity has not been evaluated for this study. Based on reports from City operations, PS 26 has not been used in several years.

3.2.3 Flow Monitoring Program

To support the development of the hydraulic model and flow projections for the Systems Evaluation Update, a temporary flow monitoring program was conducted as part of this study, including 30 meters during the 2015/2016 wet weather season (for the City's 2017 Model Update) and 12 meters during the 2018/2019 wet weather season (for SPMUD and Placer County). V&A Consulting Engineers, under subcontract to Woodard & Curran, conducted the monitoring. The meters and rain gauges were installed for a 2-month period from early January through early March for each wet weather season to capture the flow from the tributary areas. In addition, two recording rain gauges were also installed during both seasons and used for calibration of gauge-adjusted radar rainfall data. The locations of the flow monitoring sites are shown in **Figure 3-2.** The figure also shows the associated tributary area (basin) for each flow meter.

The locations of the flow meters relative to each other and to flow splits within the collection system are shown schematically in **Figure 3-3**. Note that many of the meters were located downstream of other meters; therefore, the tributary areas shown for each of these meters in **Figure 3-2** are the "incremental" areas between the flow meter and tributary basins of the upstream flow meters. Flow meter locations, pipe diameters, and upstream meters are listed in **Table 3-2** and **Table 3-3** for the permanent meters and temporary meters, respectively. Data for all meters during both flow monitoring periods are included in Appendix C.

The purpose of the flow monitoring program was to quantify the flows in the system to provide data with which to calibrate the hydraulic model (discussed later in this section), and to quantify the I/I response to storm events in various areas of the system.

Table 3-2: Permanent Flow Meters

Flow Meter ID (FM ID)	Agency	Downstream Meters	Upstream Meters
Cincinnati	Placer County	22	
Industrial	Placer County	22	
SMD-2	Placer County	11	161
Sierra College	Placer County	18	159, 160
Highlands	SPMUD	19	
North Roseville	SPMUD	22	151, 152, 153, 154, 155
Springview	SPMUD	14	156, 157, 158

Table 3-3: Temporary Flow Meter Locations

Flow Meter ID (FM ID)	Manhole ID	Diameter (in)[a]	Downstream Meters	Upstream Meters
1	E04-042	18	25	
2	E01-180	15	23	
3	D02-280	15	21	
4	B06-195	15	16, 17	
5	B04-003	12	15	
5A	B04-225	21	15	
6	C06-161	18	14	
7	D02-354	23.5	21	7A
7A	D03-115	12	7	
8	D04-201	24	24	
9	D02-068	18	21	
10	B06-341	18	16	
11[b]	A08-034	14.5	PS 26, 16, 17	SMD-2
12	B03-029	21	DC WWTP	
13[c]	B03-042	42	DC WWTP	16
14	B03-024	66	DC WWTP	6, 19, Springview
15	B03-053	36	DC WWTP	5, 5A, 15A, 17
15A	B04-082	12	15	
16	B04-151	30	13	4, 10, 11, 16A, 18
16A	B06-161	15	16, 17	
17	B05-258	21	15	4,1 6A, 11
18	B07-242	22.5	16	11, Sierra College
19	C06-024	35.5	14	20, Highlands
20	C07-003	24	19	
21	E01-149	33	23	3, 7, 9
22	F01-136	72	PG WWTP	24, 25, Cincinnati, Industrial, North Roseville
23	F01-147	36	PG WWTP	2, 21
24	F02-074	41.5	22	8
25	G04-041	21	22	1
26	F99-035	42	PG WWTP	
151	L02-001	24	North Roseville	
152	K02-005	18	North Roseville	
153	L03-014	18	North Roseville	
154	M06-004	18	North Roseville	
155	M06-003	21	North Roseville	
156	J07-058	15	Springview	
157	J07-060	18	Springview	
158	I10-037	18	Springview	
159	C9-02	17.4	Sierra College	161
160	C9-04	14.4	Sierra College	
161	B12-03	14.4	SMD-2	
162	D14-03	14.4	159	

Notes:

a. Actual measured diameter used for meter flow calculations (may be slightly different than pipe nominal diameter).
b. Meter located directly downstream of SMD-2 meter to confirm SMD-2 flows and for consistency with 2005 Flow Monitoring Program. Meter confirmed accuracy of flows at SMD-2 meter.
c. Meter placed for consistency with 2005 Flow Monitoring Program and to confirm measured flows to DC WWTP.

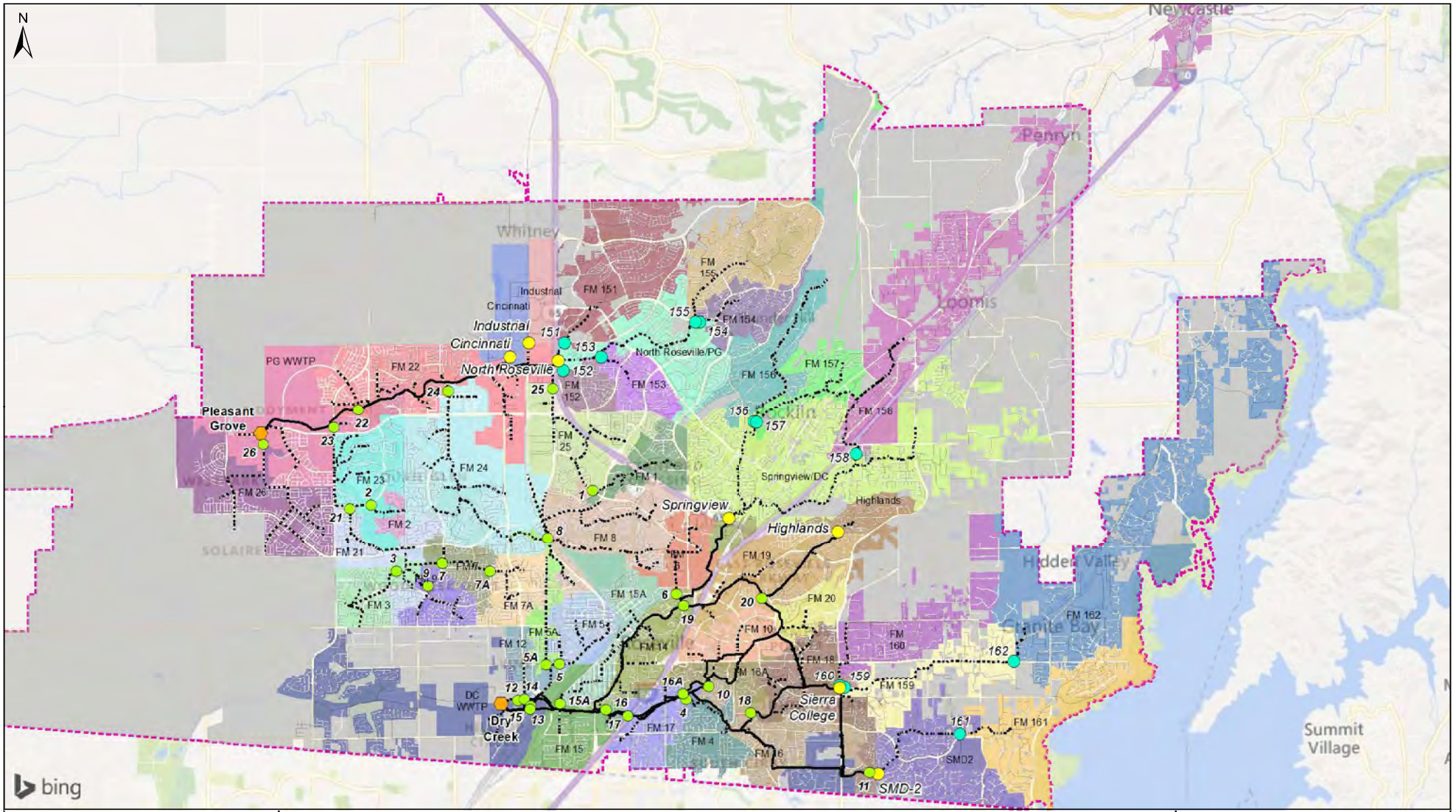


Figure 3-2

Flow Monitoring Locations

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

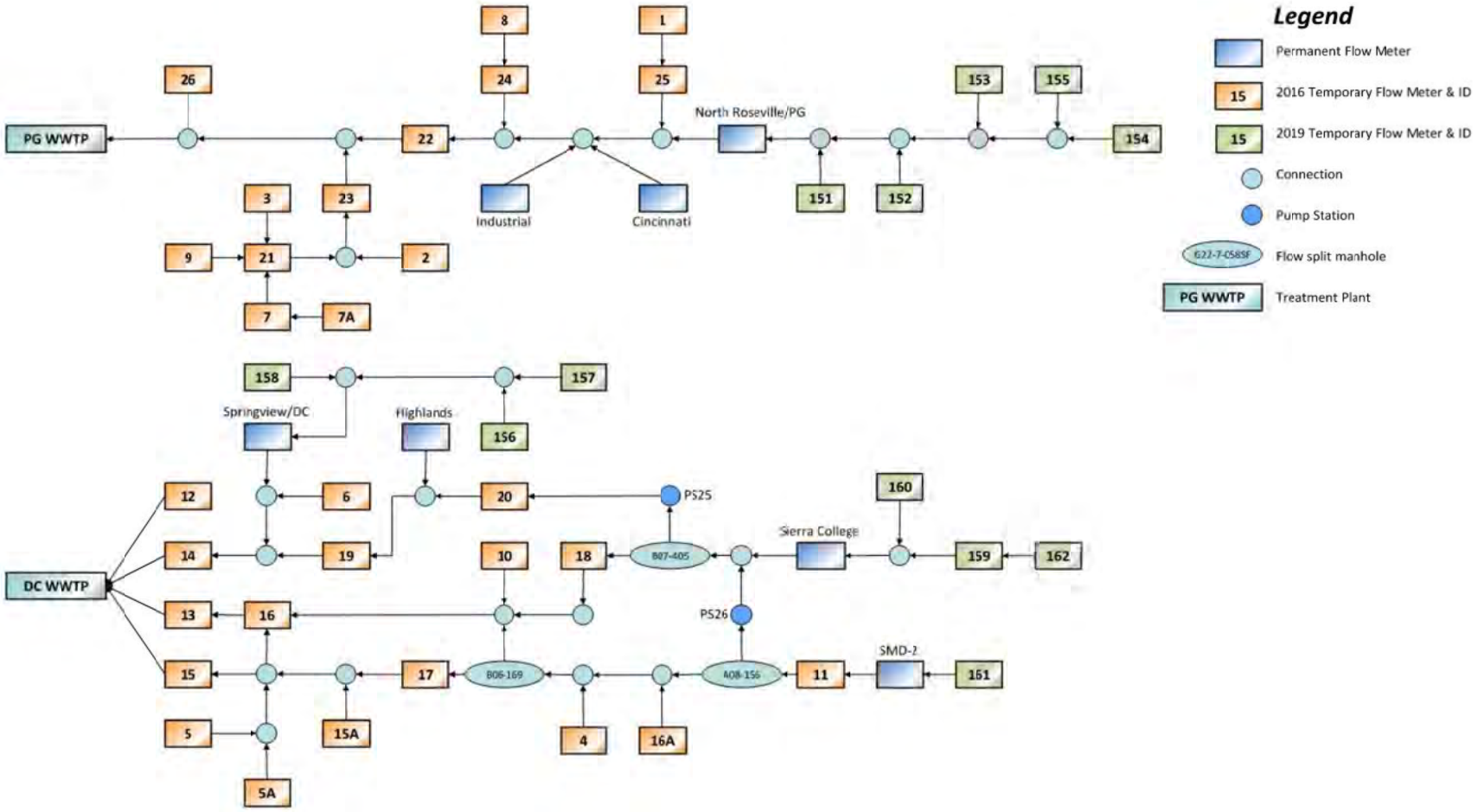
- Regional Gravity Sewer
- Regional Force Main
- Non-Regional Modeled Sewer
- Non-Modeled Sewer
- Permanent Flow Meters
- 152 2018/2019 Temporary Flow Meter
- 5 2015/2016 Temporary Flow Meter
- Wastewater Treatment Plant
- FM 152 Flow Meter Basin
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

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Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXD\Report Figures\3-2 Flow Monitoring Locations v2.mxd

Figure 3-3: Flow Meter Schematic



3.2.3.1 Radar Rainfall Data

To obtain the most accurate spatial rainfall data for use in model calibration, gauge-adjusted radar rainfall (GARR) data was obtained for the rainfall events that occurred during both monitoring periods. GARR data combines the use of spatial rainfall estimates from radar data with point rainfall measurements from rain gauges located on the ground. The radar measures the reflected signals from falling raindrops in the atmosphere, which can then be translated into estimates of rainfall rates using mathematical and empirical relationships. However, the conversion of the reflected signals to rainfall rates is not sufficiently accurate to consistently estimate actual rainfall amounts at a given location, but does provide good information about the relative rainfall amounts at different locations (i.e., the spatial variation of rainfall). Therefore, the radar rainfall estimates are calibrated to (i.e., adjusted to match) more accurate rainfall measurements from rain gauges located on the ground in the area of study.

The process of converting radar images to GARR estimates is complex and must be conducted by trained and experienced radar rainfall specialists. There are several providers of GARR data throughout U.S. Each uses its own data processing techniques and proprietary algorithms to generate the gauge-adjusted radar rainfall estimates. For this study, Woodard & Curran contracted with OneRain, Inc. to provide the GARR data. The rainfall collected by the two V&A temporary rain gauges was provided to OneRain for use in their GARR calibration to supplement data available from permanent rain gauges owned by the City for its Flood Alert System.

OneRain developed the GARR data for the flow monitoring period in 5-minute time increments for 1 kilometer by 1 kilometer pixels (each approximately 250 acres in size) covering the entire SPWA service area (including SPMUD and Placer County). Approximately 200 pixels cover the sewered portions of the service area. The data was aggregated to 15-minute intervals for use in the model. The pixel containing the centroid of each model subcatchment defines the rainfall for that subcatchment for each rainfall event.

3.2.4 Model Loading

Section 4.4 described how BWF model loads were developed from water use and land use and growth projections. GWI and RDI/I flows were also loaded to the model by parcel by associating each parcel with a flow meter area. For each parcel, a sewershed ("contributing") area (i.e., area that potentially contributes I/I) was determined based on land use. Contributing areas for non-open space land uses, including residential, commercial, industrial, and institutional uses, were based on the full parcel area. Contributing areas for parks and other land uses that may contribute sewer flows but are likely to have significant open space were limited to 1 acre. Parcels comprised of open space, drainage channels, and large roadways such as freeways not likely to contribute sewer flows were assigned zero contributing area. I/I flows for each parcel were computed in the model by applying the appropriate meter area GWI and RDI/I parameters (determined during the model calibration process described below) to the contributing area of the parcel.

Parcels loading to the same modeled manhole are grouped into subcatchments. All BWF loads associated with each parcel in the subcatchment are then summed to calculate the overall BWF loading from the subcatchment. The contributing areas are also summed, and the appropriate meter area GWI and RDI/I parameters are assigned to calculate I/I flows for each subcatchment.

3.2.5 Model Calibration

Model calibration is the process of comparing model-computed flows to observed (monitored) flows to verify that the model is accurately simulating flows in the sewer system. The model is calibrated for both dry and wet weather conditions.

As described above, temporary flow monitoring programs were conducted during the late January through mid-March 2016 and 2018 wet weather periods. The data collected during these flow monitoring programs, as well as data from the permanent meters, were used for model calibration.

3.2.6 Dry Weather Calibration

The dry period in early to mid-February 2016 (for flow meters in the City) and late January 2019 (for flow meters in SPMUD and Placer County) were used as the dry weather calibration periods for the model. The dry weather calibration process was used to verify BWF loads and diurnal curves, and to quantify GWI (as indicated by monitored flows that were higher than estimated BWF). The dry period immediately prior to the wet weather calibration period in early March was also used to confirm the calibration.

Figure 3-4 shows an example plot of model vs. metered flow for one meter location (Site 155). In this graph, the green line represents the monitored (observed) flow, and the red line is the model-simulated flow. Calibration graphs for all meters throughout the monitoring program are included in Appendix D. Note that the Sierra College permanent meter was not operational during much of the 2019 season; however, nearly all tributary flows to this meter were measured as part of the temporary metering program. While most meters calibrated well for both 2016 and 2019 data, there were a few meters with discrepancies. The discrepancies are mostly due to differences in GWI observed in the temporary meters upstream of the Springview and Sierra College meters during the 2019 flow monitoring program versus the 2016 program. As 2016 had significantly less rainfall preceding the flow monitoring program, this GWI was likely not present during the 2016 flow monitoring program.

Table 3-4 summarizes the dry weather loading parameters determined for each flowmeter area during calibration. Calibrated unit flow factors are indicated on **Figure 3-5**, while estimated GWI rates for each flowmeter area are indicated on **Figure 3-6.**

The model calibration resulted in a reasonably good match of modeled to metered flow at most locations, but some differences at others. These differences may be due to inaccuracies in the meter data, inaccuracies in the water consumption data, or in the configuration of the system (e.g., upstream flow splits). The calibration process also resulted in further investigation and adjustments at the major flow split locations in the model (manholes SMH B06-169, SMH A08-156, SMH B07-405 and SMH D04-442). To ensure accuracy during calibration, sewers in the City's trunk model were updated based on survey, field investigation and City drawings to capture the physical structures of the flow splits and then adjusted as needed to better calibrate to the flow meter data.

For a few of the meters (FM 6, 10, and 16A), the water consumption data was not sufficient to account for all of the apparent flow observed by the flowmeter. This could be due to water use not in the water consumption database (e.g. water from another source, or error in the water consumption database), or an error in the flow meter data. To be conservative, some residential flow (less than 0.1 mgd) was distributed in each of the meter areas across all parcels to improve calibration.

Table 3-4: Dry Weather Flow Loading Parameters

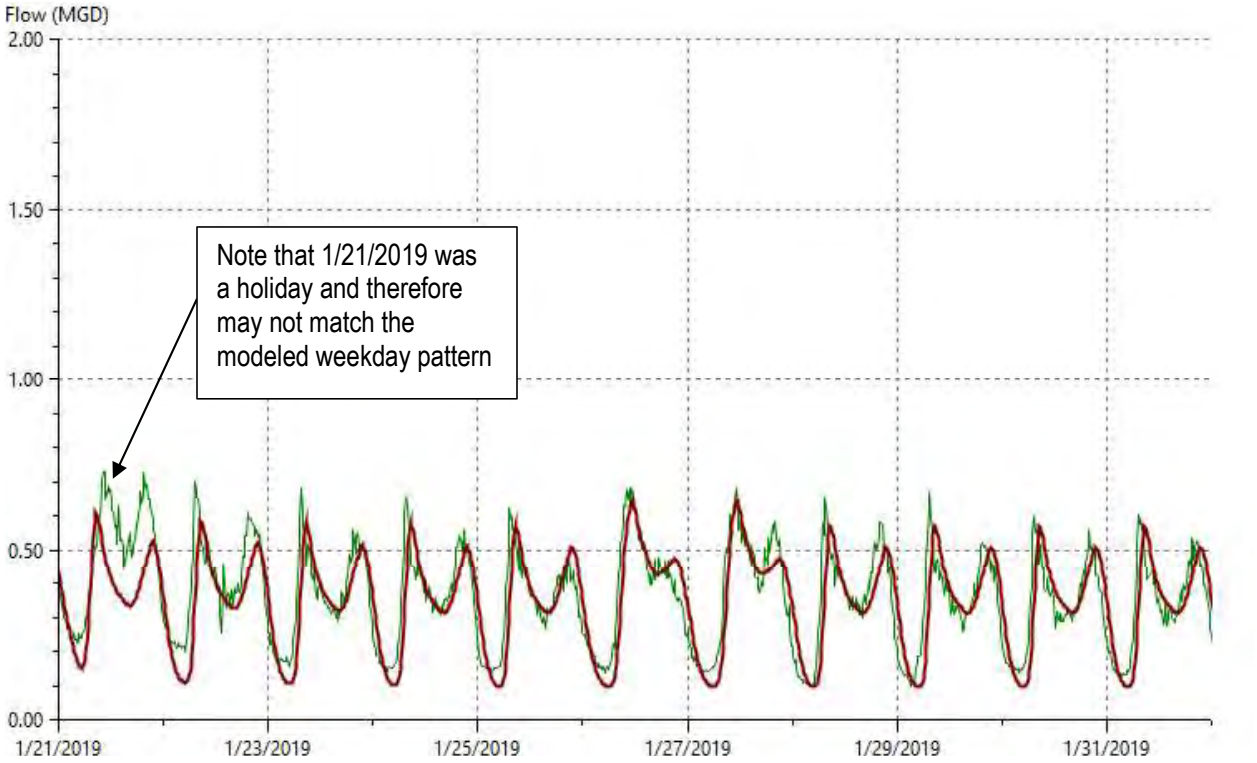
Flow Meter ID (FM ID)	Contributing Area[a] (acres)	Incremental Calibrated ABWF[a] (mgd)	Calibration ABWF Reduction Factor[b]	GWI (gpd/ac.)	GWI[a] (mgd)	Incremental Calibrated ADWF[a] (mgd)
1	297	0.28	0%	--	--	0.28
2	174	0.14	0%	--	--	0.14
3	270	0.29	0%	--	--	0.29
4	397	0.30	0%	--	--	0.30
5	241	0.30	0%	373	0.09	0.39
5A	181	0.14	0%	441	0.08	0.22
6	209	0.23	0%	192	0.04	0.27
7	181	0.19	0%	--	--	0.19
7A	349	0.42	0%	--	--	0.42
8	588	0.51	0%	425	0.25	0.76
9	209	0.22	0%	--	--	0.22
10	363	0.32	0%	--	--	0.32
11	0[b]	0.00	0%	--	--	0.00
12	157	0.15	0%	--	--	0.15
13	0[c]	0.00	0%	--	--	0.00
14	428	0.43	0%	--	--	0.43
15	328	0.31	0%	--	--	0.31
15A	326	0.30	0%	--	--	0.30
16	470	0.41	0%	1064	0.50	0.91
16A	219	0.27	0%	593	0.13	0.40
17	352	0.31	0%	--	--	0.31
18	364	0.34	0%	302	0.11	0.45
19	374	0.51	0%	561	0.21	0.72
20	172	0.18	0%	--	--	0.18
21	327	0.26	0%	--	--	0.26
22	857	0.58	0%	--	--	0.58
23	283	0.20	0%	--	--	0.20
24	932	1.38	0%	--	--	1.38
25	589	0.53	0%	170	0.10	0.53
26	423	0.34	0%	--	--	0.34
151	757	0.64	15%	--	--	0.64
152	218	0.25	0%	--	--	0.25
153	280	0.23	20%	--	--	0.23
154	384	0.23	20%	--	--	0.23
155	521	0.35	15%	--	--	0.35
156	562	0.21	15%	302	0.17	0.38
157	314	0.16	0%	96	0.03	0.19
158	1766	0.74	15%	130	0.23	0.97
159	497	0.11	0%	80	0.04	0.15
160	570	0.17	20%	175	0.1	0.27
161	818	0.21	0%	342	0.28	0.49
162	2124	0.44	0%	311	0.66	1.10
Cincinnati[d]	204	0.09	0%	--	--	0.09
Industrial[d]	121	0.06	0%	--	--	0.06
SMD-2	783	0.28	0%	--	--	0.28
Sierra College	14	0.01	0%	--	--	0.01
Highlands	344	0.11	0%	--	--	0.11

Flow Meter ID (FM ID)	Contributing Area[a] (acres)	Incremental Calibrated ABWF[a] (mgd)	Calibration ABWF Reduction Factor[b]	GWI (gpd/ac.)	GWI[a] (mgd)	Incremental Calibrated ADWF[a] (mgd)
North Roseville (Pleasant Grove)	1997	1.25	15%	--	--	1.25
Springview (Dry Creek)	605	0.55	15%	--	--	0.55

Notes:

a. For meters with upstream basins, represents the incremental meter basin area or flow, as shown on Figure 3-2.
b. Meter located directly downstream of SMD-2 meter to confirm SMD-2 flows and for consistency with 2005 Flow Monitoring Program
c. Meter placed for consistency with 2005 Flow Monitoring Program and to confirm measured flows to DC WWTP.
d. Due to highly variable and relatively small industrial flows, calibration of Cincinnati and Industrial meters was limited.

Figure 3-4: Example DWF Model Calibration Graph (Site 155)



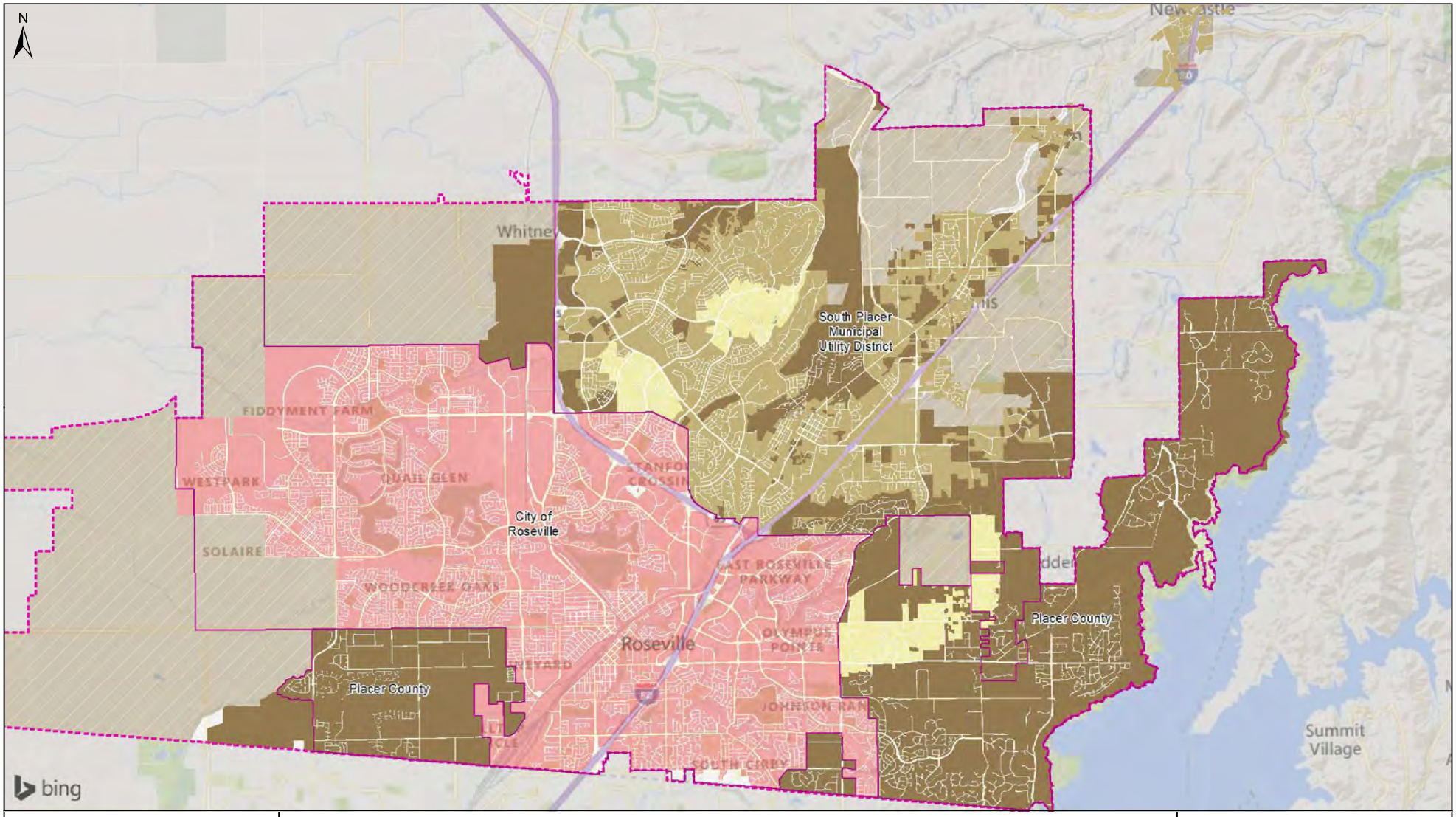


Figure 3-5

Calibrated Unit Flow Factors

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Flow Factor (gpd/EDU)

- 128
- 136
- 160

- City of Roseville (Water Billing Data)
- Future Connection
- Ultimate Service Area Boundary
- Partner Agency Boundary

Project #: 0011183.00
Map Created: December 2020

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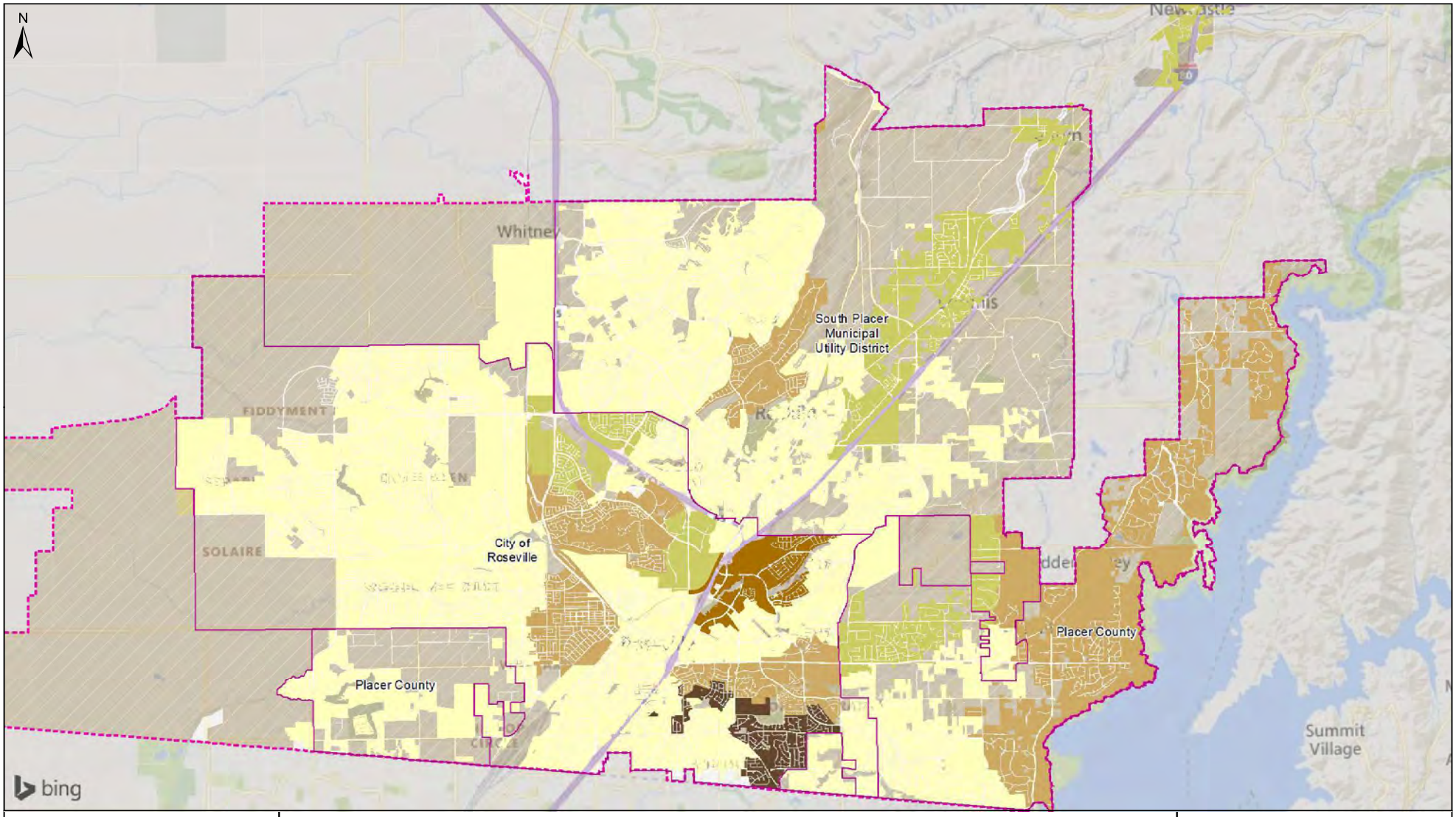


Figure 3-6

Calibrated GWI Rates

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Partner Agency Boundary

Ultimate Service Area Boundary

GWI (gpd/acre)

- < 100
- 100 - 200
- 200 - 500
- 500 - 1,000
- > 1,000
- Unconnected

Project #: 0011183.00
Map Created: December 2020

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3.3 Wet Weather Flow Projections

3.3.1 Wet Weather Calibration

During wet weather calibration, parameters are adjusted to simulate the volume and timing of RDI/I for monitored storm events. Rainfall was assigned to each parcel or subcatchment using data from the GARR pixel at the centroid of the parcel or subcatchment. Through the wet weather calibration process, RDI/I hydrograph parameters were developed for each metered area. For calibration of the City's meters, the rainfall period from March 4th through March 15th, 2016 was used to determine RDI/I parameters. This period had two storms: the first storm occurring around March 5th-6th generally had the highest rainfall totals; the second storm on March 12th-13th generally had the highest peak flows. The soils for the second storm were more saturated, and generated a larger response. For a conservative calibration, RDI/I parameters were selected to best match the response to the March 12th-13th storm. These conservative calibration conditions should be considered when using this model to evaluate capacity.

For meters in Placer County and SPMUD, two storms were used for wet weather calibration: one event occurring January 15th through January 17th, and another event February 25th through 27th, 2019. The January event was generally higher peak intensity but lower total volume, while the February event was less intense but had more total rain. Both events had similar (generally wet) antecedent conditions. Some meters had higher peak flows during the January event, while others had higher peak flows during the February event; in general, an attempt was made to calibrate for both events. Storm information for the calibration events are summarized in **Table 3-5**.

Table 3-5: Calibration Rainfall Events

Start Date/Time	Storm Duration (hours)	Total Storm Rainfall (in.)			Peak Hour (in.)		
		DC WWTP	Rocklin (Site 157)	Granite Bay (Site 162)	DC WWTP	Rocklin (Site 157)	Granite Bay (Site 162)
2016 Calibration Events							
3/5/2016 13:00	69	2.68	3.16	2.84	0.15	0.21	0.22
3/12/2016 14:00	86	2.29	2.52	2.70	0.21	0.22	0.25
2019 Calibration Events							
1/16/2019 12:00	12	1.55	1.71	1.83	0.36	0.34	0.44
2/24/2019 17:00	44	3.59	3.78	3.49	0.23	0.19	0.19

Table 3-6 summarizes the results of the wet weather calibration in terms of the R values assigned to each flow meter basin. An example wet weather calibration graph is presented in **Figure 3-7**. Calibration graphs for all meters are included in Appendix D.

Overall, most meters had relatively low R values, indicative of a tight system with newer pipes (see **Figure 3-8)**. The FM 5 and FM 7 areas exhibited more significant peak flow response. Further investigations, such as smoke tests or CCTV, may be appropriate in these area or others with higher R factors to identify potential sources of I/I (such as unauthorized stormwater discharge or leaking pipes or manholes) and any capacity concerns.

A few areas did not exhibit enough response to rainfall to develop calibration parameters; a minimum R volume response of 0.6 percent was assumed, distributed evenly between the fast, medium, and slow response R factors. For future growth areas, a minimum R volume response of 0.6 percent was also assumed, which results in a peak RDI/I under the design storm of approximately 700 gallons per acre per day (consistent with criteria for new development documented in TM 3A of the 2009 Systems Evaluation).

Table 3-6: Wet Weather Calibration Parameters

Flow Meter ID (FM ID)	R1 RDI/I Vol (%)	R2 RDI/I Vol (%)	R3 RDI/I Vol (%)	Rtot RDI/I Vol (%)
1	0.2	0.4	4.0	4.6
2	1.2	1.0	3.0	5.2
3	0.2	0.2	2.0	2.4
4	0.8	0.5	2.0	3.3
5	3.0	6.0	8.0	17.0
5A	0.2	2.0	3.5	5.7
6	0.5	1.5	1.0	3.0
7	2.5	2.0	12.0	16.5
7A	1.0	0.7	3.0	4.7
8	0.2	2.0	6.0	8.2
9	0.5	3.0	5.0	8.5
10	0.2	0.4	0.5	1.1
11	0.8	2.0	2.2	5.0
12	0.2	0.2	4.0	4.4
13	0.5	1.0	3.0	4.5
14	0.3	1.3	3.8	5.4
15	3.0	2.5	0.3	5.8
15A	0.8	0.3	0.3	1.4
16	0.5	1.0	3.0	4.5
16A	1.5	1.0	6.0	8.5
17[a]	0.2	0.2	0.2	0.8
18	0.3	2.0	5.0	7.3
19	0.3	1.3	3.8	5.4
20	0.2	0.6	3.0	3.8
21	0.2	2.0	2.0	4.2
22	0.2	0.4	4.0	4.6
23[a]	0.2	0.2	0.2	0.6
24	0.2	1.0	0.5	1.7
25	0.2	1.5	6.0	7.7
26[a]	0.2	0.2	0.2	0.6
151	0.6	0.7	0.2	1.5
152	0.7	0.3	0.1	1.1
153	1.0	0.5	0.2	1.7
154	0.4	0.5	0.1	1.0
155	1.3	1.0	1.0	3.3
156	1.0	1.3	2.0	4.3
157	0.7	0.4	0.4	1.5

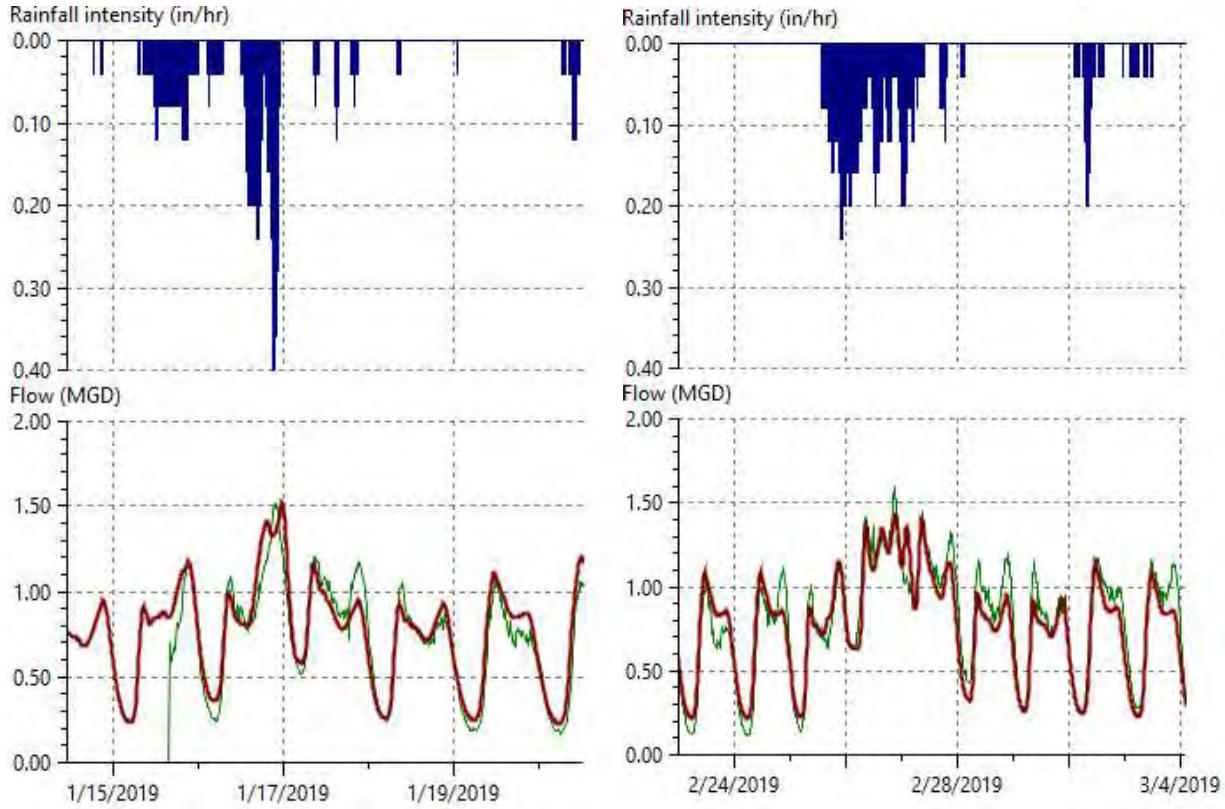
Flow Meter ID (FM ID)	R1 RDI/I Vol (%)	R2 RDI/I Vol (%)	R3 RDI/I Vol (%)	Rtot RDI/I Vol (%)
158	0.3	1.1	3.0	4.4
159	0.2	0.5	1.3	2.0
160	0.9	1.3	2.5	4.7
161	0.6	1.0	2.0	3.6
162	0.2	0.5	1.3	2.0
Cincinnati[b]	0.1	0.1	1.3	1.5
Industrial[b]	0.1	0.1	0.3	0.5
SMD-2	0.6	1.0	2.0	3.6
Sierra College	0.5	0.9	1.9	3.3
Highlands	0.7	1.0	0.4	2.1
North Roseville (Pleasant Grove)	1.3	1.3	0.3	2.9
Springview (Dry Creek)	0.7	2.0	10.0	12.7

Notes:

a. Where flowmeters did not indicate a significant response to rainfall, a minimum response of 0.6% was assumed, disbributed evenly between R1, R2, and R3. A minimum response of 0.6% was also assumed for areas of future growth.

b. Due to highly variable and relatively low industrial flows, calibration of Cincinnati and Industrial meters was limited.

Figure 3-7: Example WWF Model Calibration Graph (Site 155)



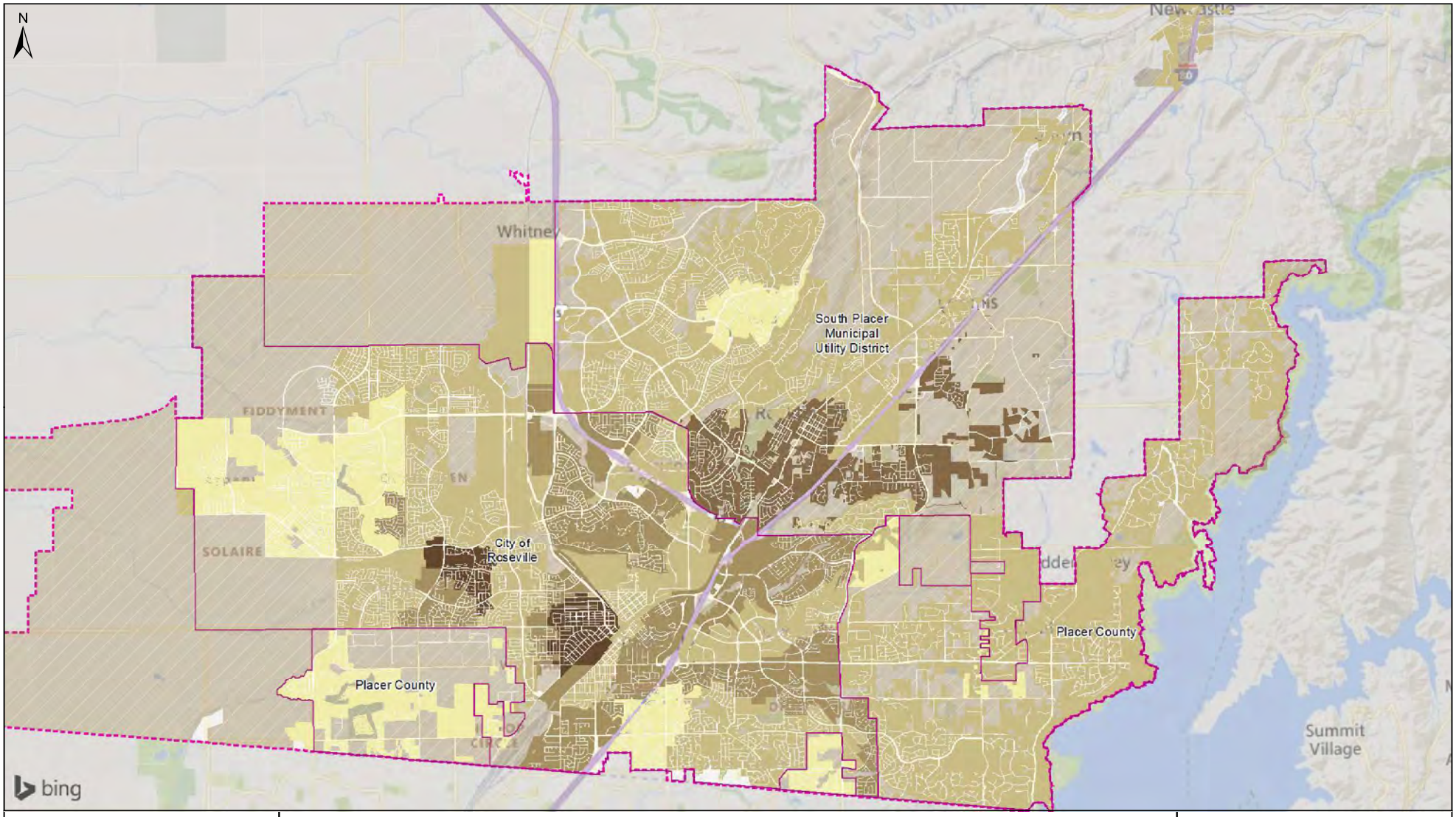


Figure 3-8

Calibrated R Values

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Unconnected

Partner Agency Boundary

Ultimate Service Area Boundary

Total R

0.3% - 1%

1% - 5%

5% - 10%

11% - 15%

> 15%

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3.4 Capacity Analysis

This section describes the hydraulic analysis and capacity criteria used to evaluate system performance and size capacity relief projects in the trunk sewer system, and identifies the capacity deficiencies based on the results of model runs.

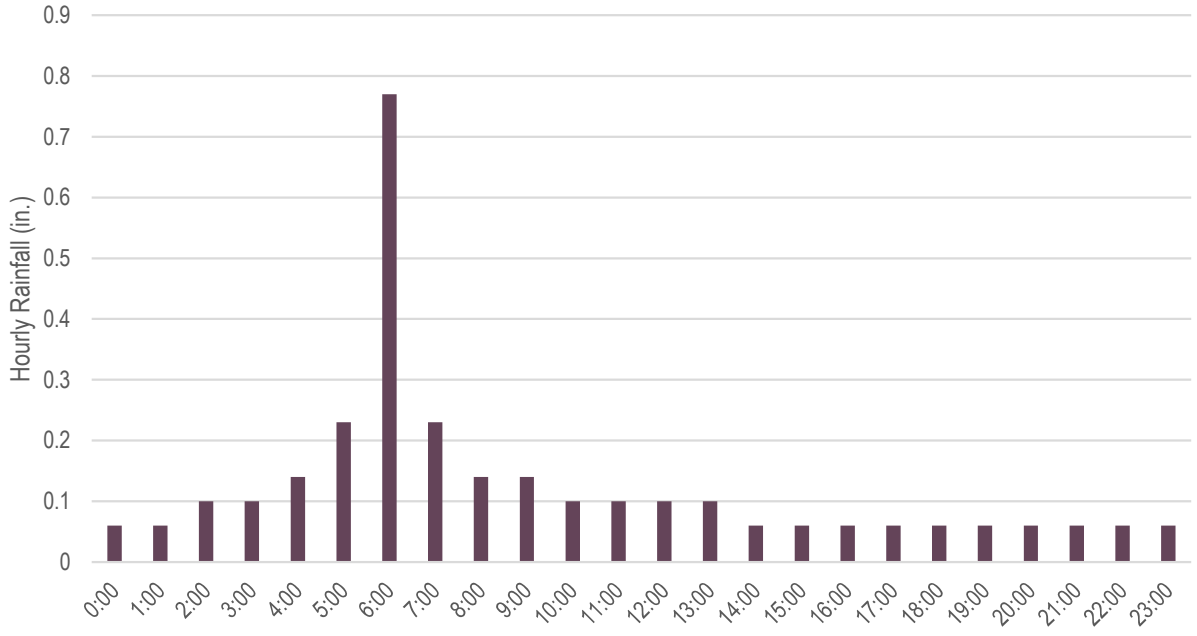
3.4.1 Design Flow Criteria

Design flows for sewer systems consist of BWF, GWI, and RDI/I. Criteria for computing existing BWF, GWI, and RDI/I (developed as part of model calibration), and flow assumptions for future development were discussed in the previous chapters. Note that for capacity analysis purposes, base wastewater flows assume rebound of approximately 15 percent from current flows.

For this Systems Evaluation Update, design RDI/I is based on a 10-year 24-hour synthetic rainfall pattern that occurs uniformly across the entire service area. The event used is the same event as used for the previous 2009 Systems Evaluation. The design storm hyetograph was developed utilizing Table 5-A-1 (elevation (h) = 150 feet) from the 1990 Placer County Flood Control and Water Conservation District Stormwater Management Manual (1990 Placer County Stormwater Management Manual). This event has a 1 hour peak intensity of 0.77 inches and a 24-hour rainfall depth of 2.97 inches. The peak rainfall hour was set at 6 a.m. so that the peak RDI/I response (which would normally occur about 1-2 hours after the rainfall for a typical basin) roughly coincides with the peak hour of the dry weather profiles to give a conservative flow response in the collection system. The intensity and timing of the design storm is presented in **Figure 3-9**.

It should be noted that current NOAA statistics (NOAA Atlas 14, updated in 2014) have a somewhat lower peak hour rainfall intensity, though slightly higher 24-hour rainfall depth (1 hour peak intensity of 0.65 and 24-hour depth of 3.35 inches). As the design event developed from the 1990 Placer County Stormwater Management Manual was likely to result in higher peak flows, and therefore more conservative estimate of system capacity, that design event was selected for this evaluation. NOAA Atlas 14 data confirms that design rainfall intensity does not vary significantly across the SPWA service area.

Figure 3-9: SPWA 10-year Design Storm Event



3.4.1.1 Summary of Flows Under Design Storm

A summary of modeled flows based on the design flow criteria is included in **Table 3-7.**

Table 3-7: Modeled ADWF and Peak Wet Weather Flow Summary

	Existing (Rebound)			Buildout			Buildout-Sensitivity		
WWTP	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a]	ADWF (mgd)	PWWF[b] (mgd)
Pleasant Grove	9.5	9.9	27.4	26.1	26.5	55.8	26.2	26.5	56.0
Dry Creek	10.1	12.7	41.9	16.7	19.2	59.2	18.2	20.8	60.6

Notes:
a. Does not include wet season groundwater infiltration (GWI).
b. Modeled PWWF assumes improvements have been implemented to eliminate overflows and significant surcharging.

3.4.2 Hydraulic Capacity Criteria

Capacity deficiency or performance criteria are used to determine when the capacity of a sewer pipeline is exceeded to the extent that a capacity improvement project (e.g., a relief sewer or larger replacement sewer) is required. Capacity deficiency criteria are sometimes called "trigger" criteria in that they trigger the need for a capacity improvement project. These criteria may differ from "design criteria" that are applied to determine the size of a new facility, which may be more conservative than the performance criteria. The 2009 Systems Evaluation identified several hydraulic capacity criteria:

- No surcharging in SPWA sewers, though exceptions were made where limited surcharging may occur in relatively deep pipes. Note that surcharging due to downstream conditions (i.e. backwater conditions) may not be considered a deficiency.
- Pump stations are considered capacity deficient if the design storm PWWF exceeds the pump station capacity with the largest pumping unit out of service (i.e. firm capacity).
- Force mains with velocities exceeding 7 feet per second under PWWF may require further investigation, though would not trigger a project unless the pump station required additional capacity.

As the current model is a calibrated fully-dynamic model, the design condition represents a relatively infrequent storm event, and many of SPWA's sewers are relatively deep, a less conservative surcharge criteria was applied, with surcharging up to within 5 feet of the manhole rims (ground surface) considered acceptable under 10-year design storm PWWF, as long as the surcharge (flow height in the manhole) does not exceed 4 feet from the top of pipe up the manhole. The pump station and force main criteria from the 2009 Systems Evaluation were unchanged.

3.4.3 Capacity Analysis Results

The calibrated model was run for Existing, Buildout, and Buildout-Sensitive land use scenarios under the design event described above. Several deficiencies were identified in non-regional facilities which resulted in model-predicted overflows for one or more of the scenarios; to ensure flows were conveyed to regional sewers, pipes were upsized in this analysis to eliminate any overflows.

Within the regional system, seven areas have been identified that either have deficiencies or could be impacted when upstream deficiencies are relieved. Note that not all areas have been identified as having capacity deficiencies.

- **Area A** includes the sewers on Old Auburn Road immediately downstream and upstream of PS 26. This area is designed to divert flows above the springline of the sewer into PS 26. However, since PS 26 has insufficient firm capacity during peak wet weather flows, the sewers back up into the upstream sewers and results in a modeled overflow. This is an area of known capacity concerns. If flows through PS 26 were increased, the capacity issues in this area would be relieved.

- **Area B** includes the trunk sewer downstream of Area A from Old Auburn Road to SMH A06-257, which is where flow from PS 26 rejoins this trunk sewer. Note that there are two shallow manholes in this area that have less than 5 feet of cover (SMH A07-234 and SMH A07-091). Sewer depths should be investigated, and, if depths are confirmed, bolting manhole covers should be considered.

- **Area C** includes the trunk sewer downstream of Area B (from SMH A06-257) to the junction structure at Oak Ridge Drive. The junction structure at Oak Ridge Drive connects a 15-inch trunk (modeled, but not part of the regional system) to the main 33-inch trunk, but allows high flows to overtop a weir into a parallel 15-inch trunk sewer.

- **Area D** includes the 30-inch and 33-inch trunk sewer downstream of the Area C (from Oak Ridge Drive), to the 42-inch sewer near Riverside Age.

- **Area E** includes the 15 and 21-inch sewers from the Sierra College permanent meter to the weir structure adjacent to PS 25.

- **Area F** includes the area downstream of Area E, extending from PS 25 to the upstream manhole of Area C (SMH A06-257).

- **Area G** includes the gravity sewer downstream of PS 26, extending to the intersection with Area E.

Model results under Existing and Buildout conditions are summarized in **Table 3-8** and shown in **Figure 3-10** and **Figure 3-11**, respectively. The figures indicate existing trunk sewers that were predicted by the model to be surcharged (water levels in manholes above the crowns of the pipes) due to "throttle" conditions (peak flow exceeding full pipe capacity) or due to backwater from a downstream throttle condition, and locations of model-predicted overflows. Note that **Figure 3-11** shows the results for both the Buildout and Buildout-Sensitivity scenarios (i.e. there is no difference in surcharge locations between the scenarios). In **Table 3-8**, areas that exceed the hydraulic capacity criteria but do not have modeled overflows are highlighted yellow, while areas with modeled overflows are highlighted orange. Hydraulic profiles for each area under existing and Buildout land use conditions are included in Appendix E.

Table 3-8: Capacity Results under Existing and Buildout Land Use Scenarios[a]

Area	Existing (with Rebound)			Buildout and Buildout-Sensitivity		
	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)
A	5,530	7.3	0.0	5,530	7.8	0.0
B	3,369	1.9	2.0	3,948	7.7	0.0
C	522	1.0	7.4	6,009	6.4	2.8
D	700	1.1	8.6	4,220	3.3	6.4
E	--	--	--	2,223	3.1	5.6
F	--	0.9	12.2	1,716	7.3	2.2
G	--	--	--	0	2.3	3.3

a. Areas that exceed the hydraulic capacity criteria but do not have modeled overflows are highlighted yellow, while areas with modeled overflows are highlighted orange.

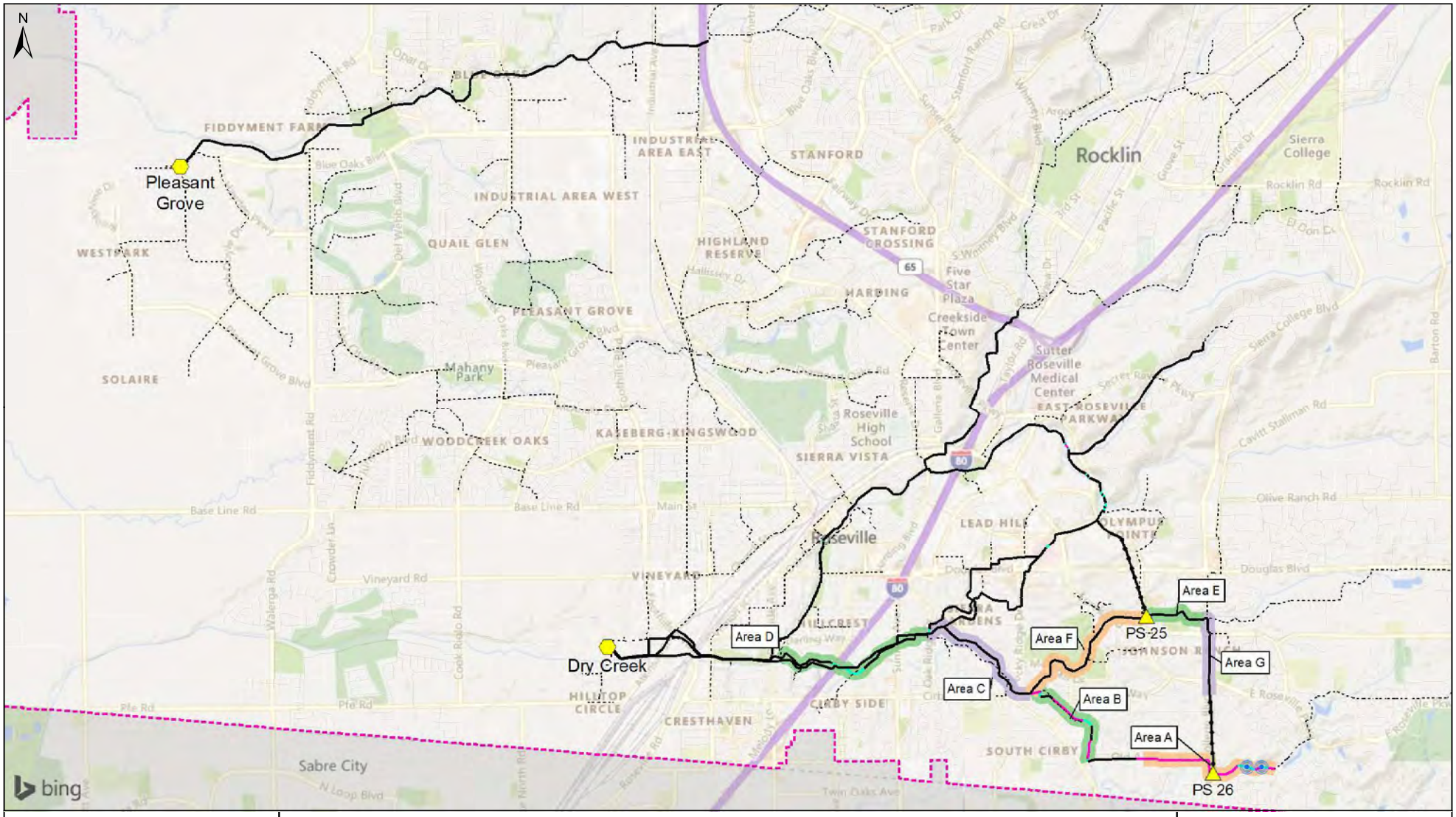


Figure 3-10
Model Results (Existing PWWF)

South Placer Wastewater Authority
2020 Systems Evaluation

0 ¼ ½ 1 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Backwater Surcharge
- Throttle Surcharge
- Modeled Sewer Overflow
- Deficiency Area
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

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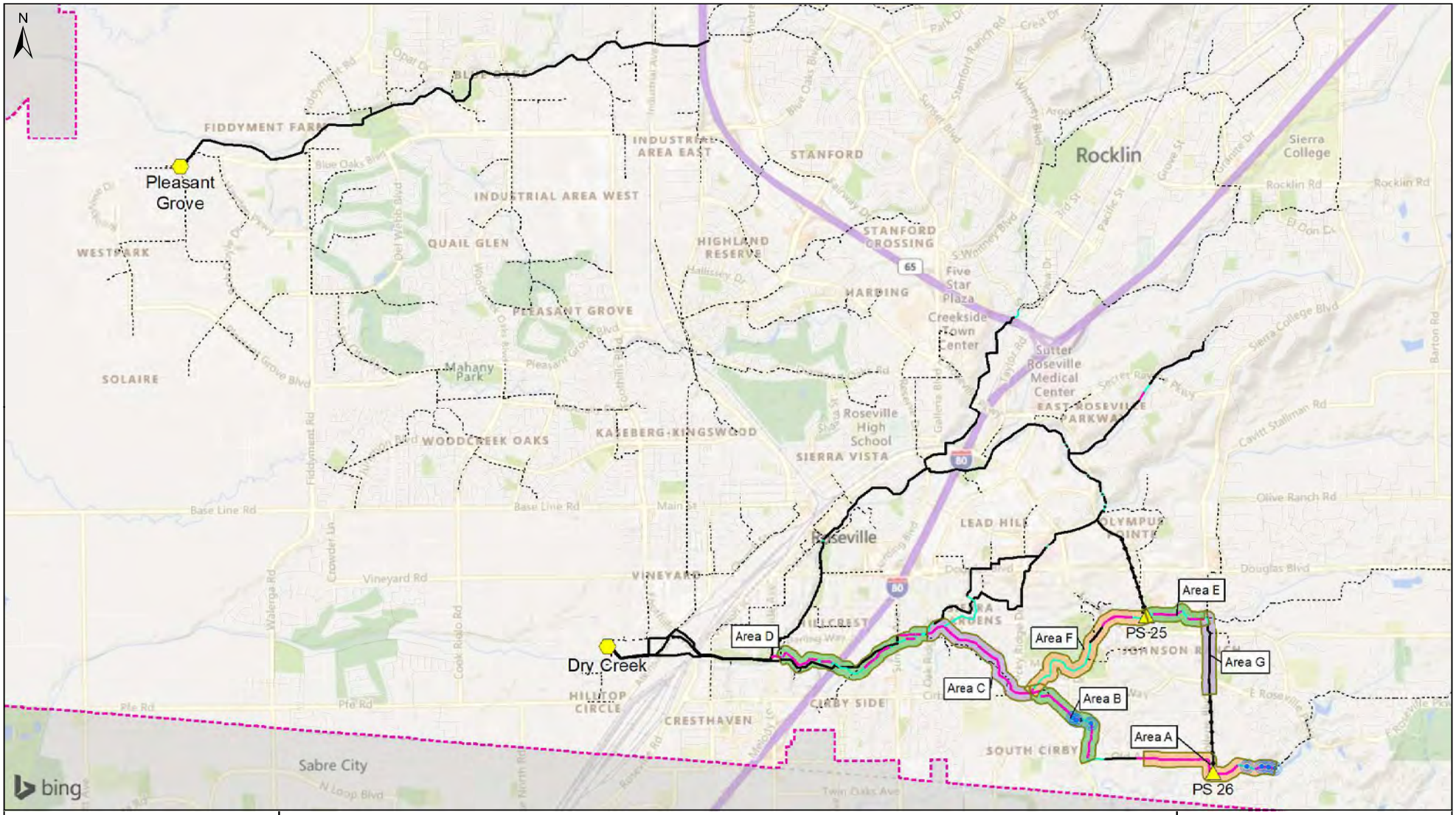


Figure 3-11

Model Results (Buildout and Buildout Sensitivity PWWF)

South Placer Wastewater Authority
2020 Systems Evaluation

0 ¼ ½ 1 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Backwater Surcharge
- Throttle Surcharge
- Modeled Sewer Overflow
- Deficiency Area
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

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3.5 Proposed Improvements

Proposed improvement projects have been developed, and verified using the hydraulic model, to alleviate surcharge in the areas described in the previous section. Each proposed project was reviewed on aerial mapping to identify potential design and constructability issues. Preliminary estimates of probable construction costs were prepared.

This section discusses these proposed improvements as well as the criteria used to develop them and estimate costs. The projects are considered planning level, and further pre-design of each project is recommended prior to implementation.

3.5.1 Design Criteria for New Sewer Facilities

Section 9 of the City of Roseville Design Standards (January 2019) details criteria for Sanitary Sewer Design. These criteria are used during the development of new standards and applied to any new infrastructure.

3.5.1.1 Gravity Sewers

Below is a list of select City design standards for gravity sewers. See Section 9 of the Design Standards for a full listing of criteria.

- Minimum slopes and flow capacities summarized below

Pipe Diameter (in)	Slope (ft/ft)	Capacity (at 0.7 Depth)	Capacity Flowing Full
6	0.0050	0.22 MGD	
8	0.0035	0.38 MGD	
10	0.0025	0.58 MGD	
12	0.0020	0.85 MGD	1.00 MGD
15	0.0015	1.32 MGD	1.60 MGD
18	0.0012	1.95 MGD	2.35 MGD

- Maximum allowable depth-to-diameter ratio (d/D) of 0.7 at design flow for laterals 10 inches or less. Pipes 12" or greater may be designed to flow full unless connections are planned, in which case the 0.7 depth-to-diameter ratio governs.
- Flow velocities must be between 2 feet per second and 10 feet per second.
- Maximum bury depth of main with lateral connection shall be 15 feet. Minimum slope of lateral connection shall be ¼ inch per foot with a minimum bury depth of 12 inches at any buildable location within the properties to be served.
- Maximum spacing of manholes shall be 500 feet for all straight lines of 10 inches in diameter or less. Manhole spacing for mains 12 inches and larger shall be considered on a case by case basis.
- The invert elevation for pipe of the same diameter entering a manhole shall have a 0.10-foot drop between the entering and exiting pipe and invert elevations for pipe of different diameters shall match crown of exiting pipe. The crown of the entering pipe shall be at the same elevation or higher than the exit pipe.
- Drop connections shall be permitted under special conditions and with the approval of the Environmental Utilities Director

3.5.1.2 Pump Stations and Force Mains

Below is a list of select City design standards for pump stations and force mains. See Section 9 of the Design Standards for a full listing of criteria.

- A sufficient number of centrifugal pumping units shall be installed such that station capacity can be maintained with any one unit out of service.
- Provisions for 4 hour storage capacity shall be provided.
- Planning level criteria as follows:

Pump Stations	
Capacity	PWWF (hydraulic modeling required for pipes 18 inches and larger)
Storage	4 hours
Operation	Lead/lag for duty pump(s), plus 1 standby pump
Maximum Pump Cycles	6 cycles/hour (3 cycles per pump)
Force Mains	
Headloss	Hazen-Williams roughness coefficient (C-factor) of 120
Maximum Velocity	7-10 feet per second
Minimum Velocity	3.0 feet per second

3.5.2 Cost Criteria

Opinions of probable costs for proposed capacity improvement projects were developed based on Woodard & Curran's experience with similar projects and discussions with product vendors. The estimated construction costs are based on a Class 4 estimate as defined by the Association for the Advancement of Cost Engineering (AACE) International cost estimate classification system. **Table 3-9** provides a summary of the estimate classes and expected accuracy range. For Class 4 estimates, the expected accuracy range is -15% to -30% on the low end and +20% to +50% on the high end.

Table 3-9: Cost Estimate Classification Matrix (AACE International)

Estimate Class	Level of Project Definition	Purpose of Estimate	Methodology	Expected Accuracy Range
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgement, or analogy	Low: -20% to -50% High: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	Low: -15% to -30% High: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	Low: -10% to -20% High: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	Low: -5% to -15% High: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-cost	Low: -3% to -10% High: +3% to +15%

Source: AACE International Recommended Practice No. 18R-97

These estimates are suitable for use for budget forecasting, CIP development, and project evaluations, with the understanding that refinements to the project details and costs would be necessary as projects proceed into the design and construction phases. All costs have been adjusted to an Engineering News Record Construction Cost Index (ENR CCI) of approximately 12,115, which represents the average of the April 2020 ENR CCI for "20 Cities Average" and "San Francisco" indices.

Cost criteria include baseline unit construction costs for gravity sewers using open-cut methods. Pipe bursting is sometimes a more cost-effective option for projects that involve upsizing existing sewers to 15-inch diameter or smaller; this construction method could be considered during design. Costs for gravity trunk sewers vary with pipe diameter and depth (in the case of open-cut construction). Allowances added to the baseline construction cost include mobilization/demobilization and project-specific for remove and replace construction and traffic control for work in roadways. A 30 percent allowance for contingencies for unknown conditions was also included for all projects, as well as an allowance of 25 percent of construction cost for engineering, administration, and legal costs. For pump stations, costs include site work, mechanical and electrical equipment specific to each station.

3.5.3 Proposed Capacity Improvement Project Descriptions

Improvement projects were developed as a series of improvements that sequentially decrease surcharging in downstream sewers. These improvement projects, including estimated capital improvement costs, are discussed below and summarized in **Table 3-10** and shown in **Figure 3-12**. Individual improvement project cost estimate details as well as detailed project figures are provided in Appendix F.

3.5.3.1 Improvement Project 1

Improvement Project 1 would increase the capacity of PS 26 (Sierra College Boulevard PS) as needed to limit surcharging in the Old Auburn Trunk sewer (Area A and Area B). The weir leading to PS 26 would be unchanged and would divert flows when depth in the sewer exceeds half the sewer diameter. Because this project would substantially increase flows through the sewer on Sierra College Boulevard (Area G), this project also includes upsizing those pipelines to 10, 12, and 15-inch sewers to eliminate surcharging in that line.

PS 26 will need to be modified to meet the increased firm capacity, from 0.43 mgd to 1.6mgd. If the existing wet well is large enough, it could be retrofitted with new, higher flow pumps. The existing wet well at PS 26 is 8 feet in internal diameter. Updated design criteria were provided to a Flygt pump representative and, based on the minimum wet well sizing for their recommended pump selection, the existing wet well is sufficiently large to be reused with a larger pump.

The pump selection provided should be considered preliminary. Given the high total pump station head and large motor of the resulting pump selection, an evaluation of alternatives to reduce the pump size, via upsizing the discharge force main for example, should be considered during pre-design. A life cycle cost analysis may be appropriate to compare the difference between the additional headloss and resulting pumping costs versus the cost to upsize the force main.

3.5.3.2 Improvement Project 2

Improvement Project 2 would re-route the sewer on Sierra College Boulevard east on Eureka and reconnect to the regional trunk at East Roseville Parkway (Area F). This would relieve surcharge in Area E. Excess flows resulting in surcharge in Area F would be diverted through PS 25 to the northern sewershed, which does not have capacity concerns. The preliminary project would upsize existing 8 and 10-inch sewer on Eureka Road and E Roseville Parkway. Since the connection is about 100 feet downstream of the PS 25 diversion structure, this improvement project may increase flows (and associated surcharge) in Area F (unless adjustments are made to the PS 25 diversion structure, as discussed in Improvement Project 3).

3.5.3.3 Improvement Project 3

Improvement Project 3 would alter the piping and diversion structure in the vicinity of PS 25 (Rollingwood PS) to convey additional flow away from Area C, Area D, and Area F, and increase the capacity of PS 25 as needed to accommodate the additional flow. For this improvement project, the diversion structure would be converted to divert any flows exceeding peak dry weather flow (up to approximately 2.6 mgd with buildout land uses under peak wet weather conditions),. It should be noted that the 2009 Systems Evaluation assumed diversion of 3.2 mgd through PS 25 with buildout land uses under peak wet weather conditions.

A new junction structure would need to be installed at E Roseville Parkway (or the existing junction structure would need to be relocated) in order to capture the additional flows.

PS 25 would need to be modified to meet the increased firm capacity. If the existing wet well is large enough, it could be retrofitted with new, higher flow pumps. The existing wet well at PS 25 is 10 feet in internal diameter. Updated design criteria were provided to a Flygt pump representative and, based on the minimum wet well sizing for their recommended pump selection, the existing wet well could be reused.

Table 3-10: Proposed Capacity Improvement Projects

Project	Location	Existing Sizes	Improved Sizes[a]	Description	Estimated Capital Improvement Cost
1	PS 26	0.43 mgd firm capacity	1.6 mgd PWWF at Buildout	Increased Capacity of PS 26 and sewers on Sierra College Blvd directly downstream of PS 26 to relieve Old Auburn Trunk sewer (Area A)	$1,606,000
	Sierra College Blvd (Area G)	500 ft of 8-inch 1,900 ft of 10-inch	500 ft of 10-inch (upsized from 8-inch) 900 ft of 12-inch (upsized from 10-inch) 1,000 ft of 15-inch (upsized from 10-inch)		
2	Eureka Road and E. Roseville Parkway	800 ft of 8-inch 1,400 ft of 10-inch	2,200 of 15-inch (upsized from 8 or 10-inch) 1,200 ft of new 15-inch.	Redirect flows from PS 26 and Sierra College Blvd down Eureka Road to relieve Area E.	$1,831,000
3	PS 25 (pumps)	2.02 mgd firm capacity	2.6 mgd PWWF at Buildout	Increased Firm capacity of PS 25 to meet Buildout PWWF (depends on alternative). New weir structure or adjustments to existing structure at PS 25 to convey the maximum potential flow through PS 25 without any dry weather flows.	$758,000
	PS 25 diversion structure	N/A	New diversion structure and related piping		

Notes:

a. Note that pipeline capacity increases could be accomplished through parallel pipes, rather than upsizes.

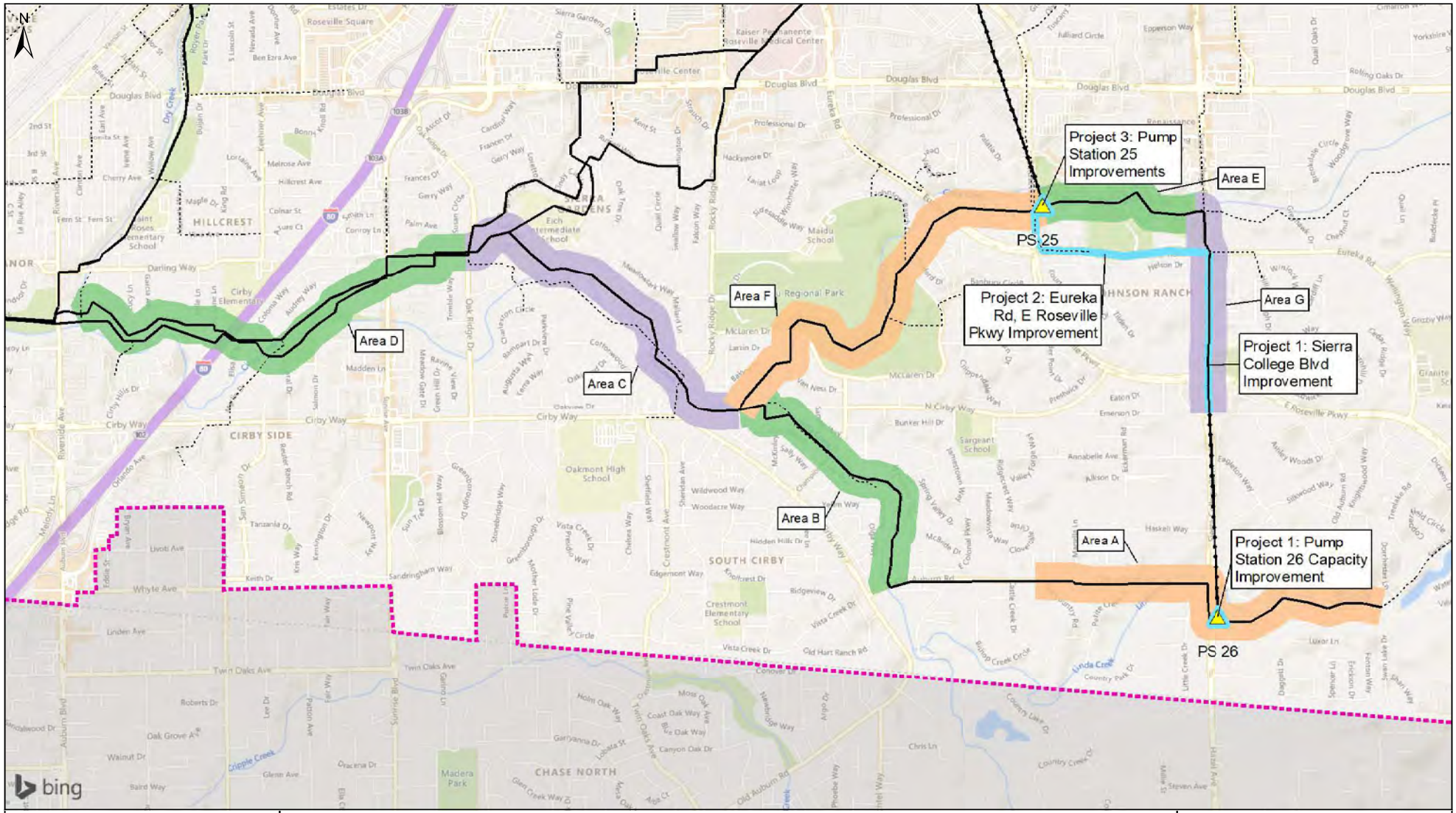


Figure 3-12
Proposed Improvement Locations

South Placer Wastewater Authority
2020 Systems Evaluation

0 0.125 0.25 0.5 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Pump Station
- Preliminary Capacity Improvement Area
- Deficiency Area
- Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

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