2020 URBAN WATER MANAGEMENT PLAN

CITY OF ROSEVILLE CALIFORNIA

City of Roseville 2020 Urban Water Management Plan

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Table of Contents

City of Roseville Tables

Department of Water Resources Tables

Figures

Appendices

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 sought involvement from the public and other local water agencies. Neighboring water retail suppliers and the community were informed of a public hearing held on June 16, 2021. In this public hearing the

plan was presented, and attendees were encouraged to share questions and concerns. Following the public hearing, an adoption hearing for the UWMP was held on June 16, 2021 during which City Council adopted the UWMP.

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 was adopted by City Council on June 16, 2021. The 2020 UWMP will 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 prefix, "DWR Table". Additional data reporting is done in City of Roseville Tables denoted by the prefix, "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 held 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.

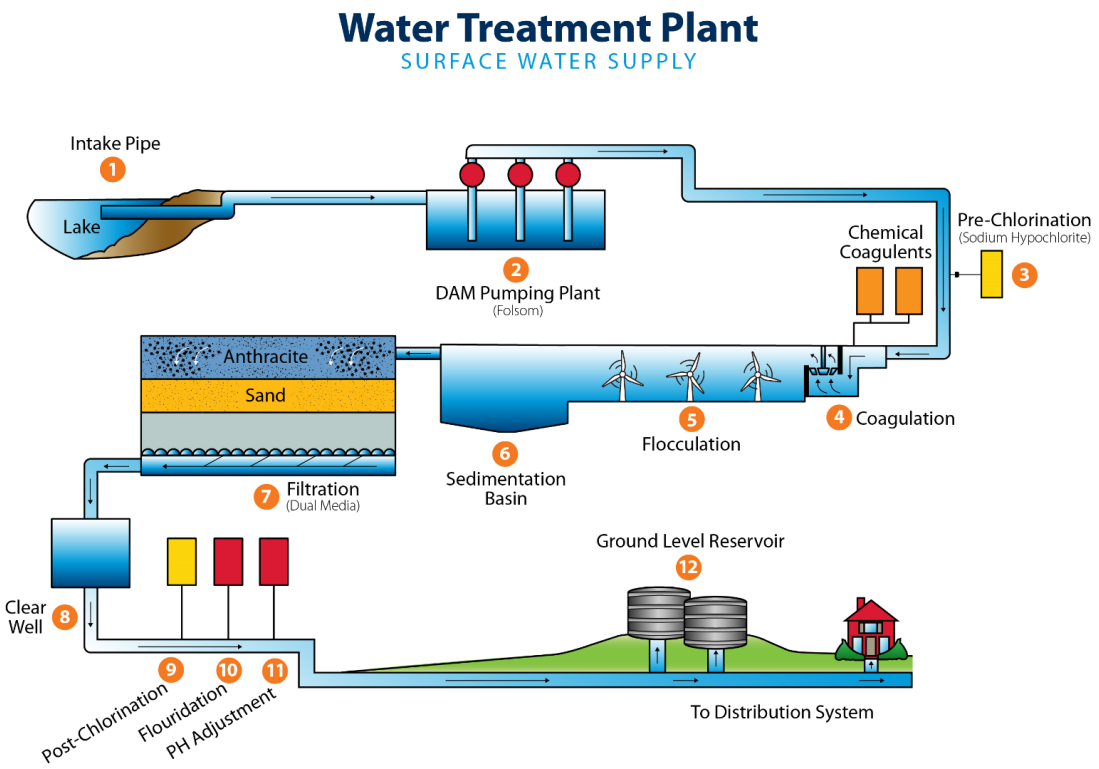


Figure 3-1. City of Roseville Water Treatment Plant Treatment Train

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

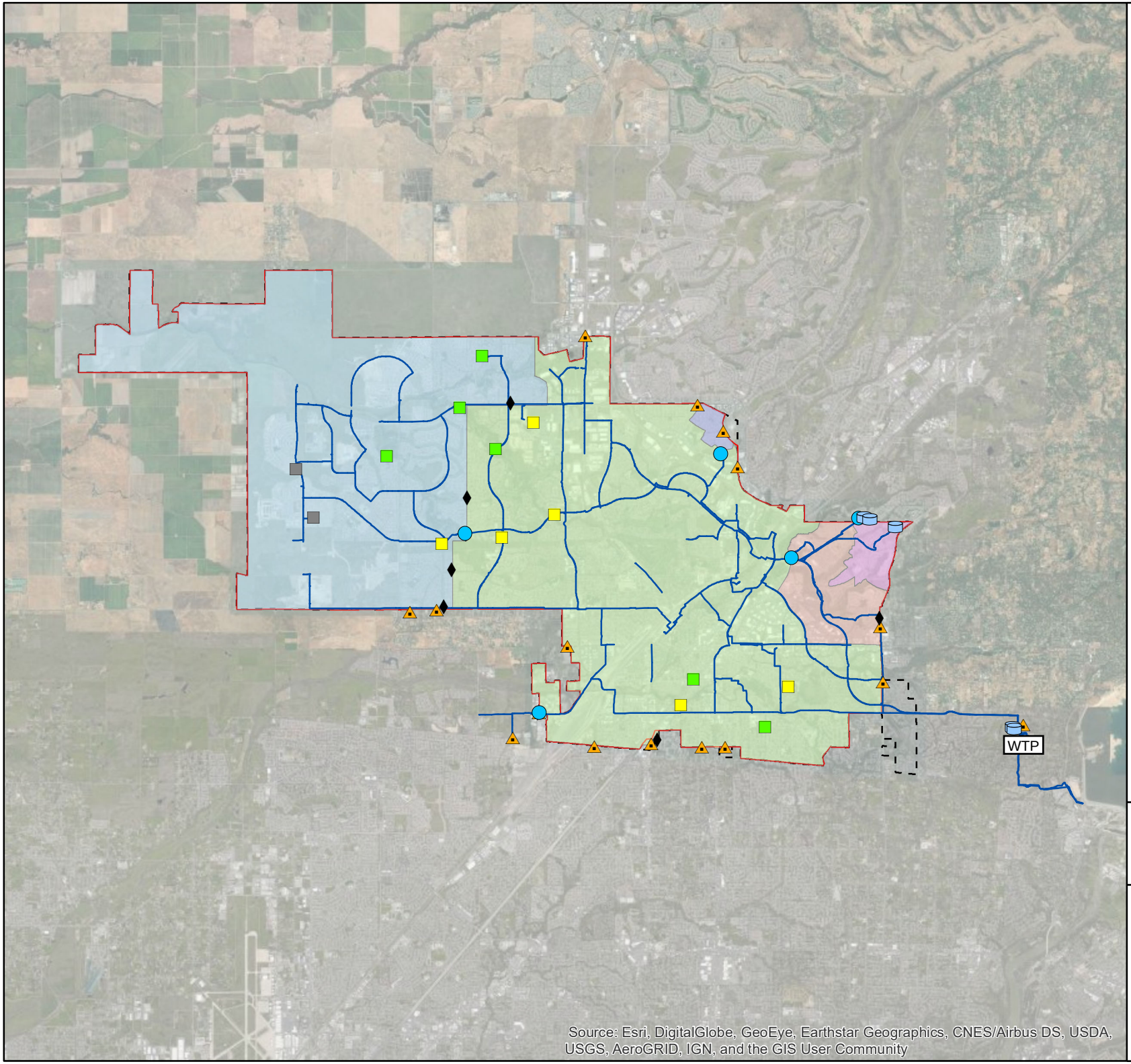
The three interties between the City and CHWD can all be used to deliver water to and from the City. All three are intended for emergency use and under normal operating conditions remain closed.

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.



Legend

- WTP — Water Treatment Plant
- Water Tank
- Well - In Service
- Well - Proposed
- Well - Inactive
- Pump Station
- Pressure Reducing Station
- Intertie
- Transmission Water Mains
- Pressure Zone 1
- Pressure Zone 2
- Pressure Zone 3
- Pressure Zone 4
- Pressure Zone 5
- Service Area
- Roseville City Limits

N

0 0.5 1 2 Miles

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 Section 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

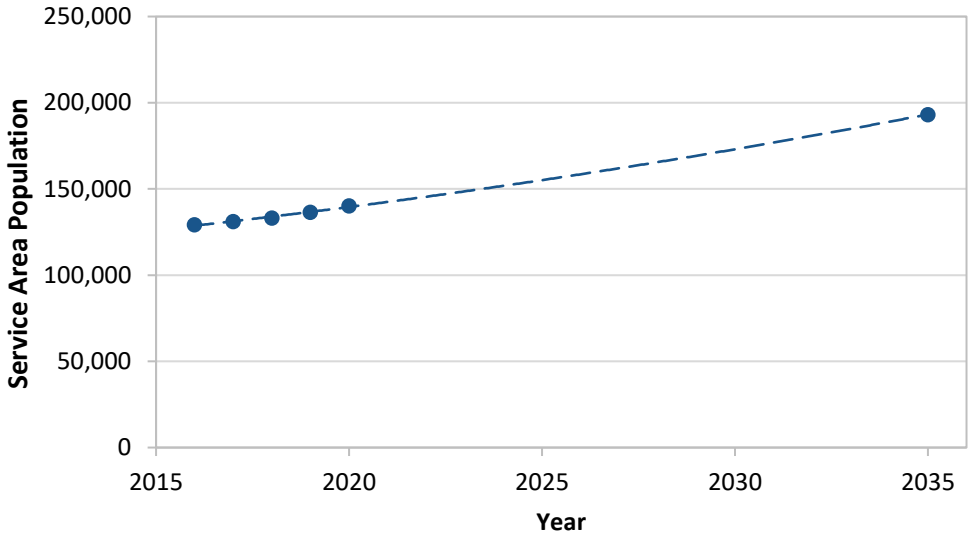


Figure 4-1 Existing and Projected Service Area Population

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	47,567	52,555	57,614	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 at https://qcode.us/codes/roseville/).

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 at https://qcode.us/codes/roseville/).

4.2.7.3 Implementation of Low Water Use Fixtures

Section 16.04.100 (A.) of the Roseville Municipal Code states that: "The 2019 California Building Standards Code is hereby adopted by the City of Roseville Municipal Code." The Roseville Municipal Code is available via the City's website at https://qcode.us/codes/roseville/.

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 17 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.

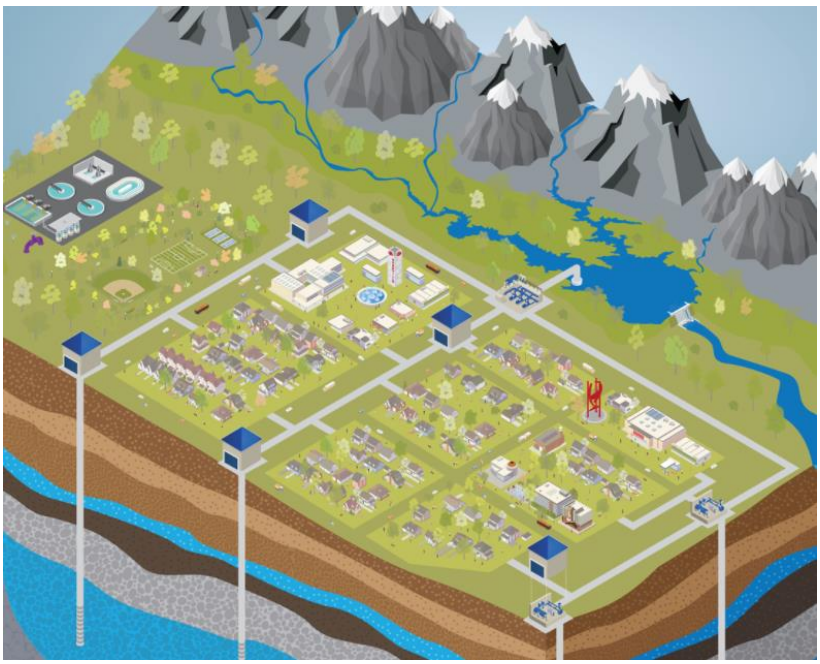


Figure 6-1 Urban Groundwater Infrastructure Schematic

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	3,390	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.	1,841	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	2,403	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 and Creekview Ranch School	378	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	4,022	4,022	4,435	4,435	4,933	4,933	4,933	4,933	4,933	4,933
	Total	64,482	77,942	66,055	83,005	70,543	88,723	70,543	88,723	70,543	88,723

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. The City is signatory to the Water Forum Limitation and has committed to not take the entire amount available through the USBR – CVP Contract Supply, this commitment is reflected as -7,100 above. 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.

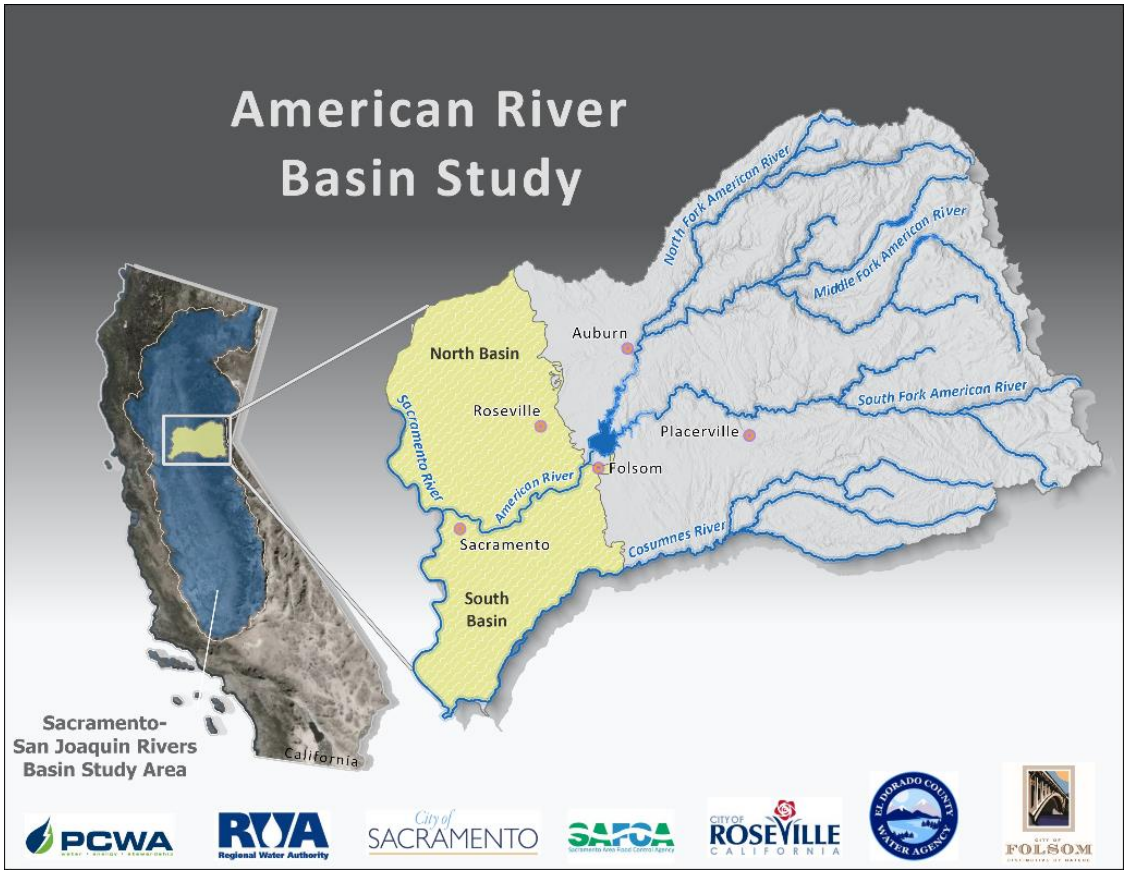


Figure 6-2 American River Basin Study Area

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.

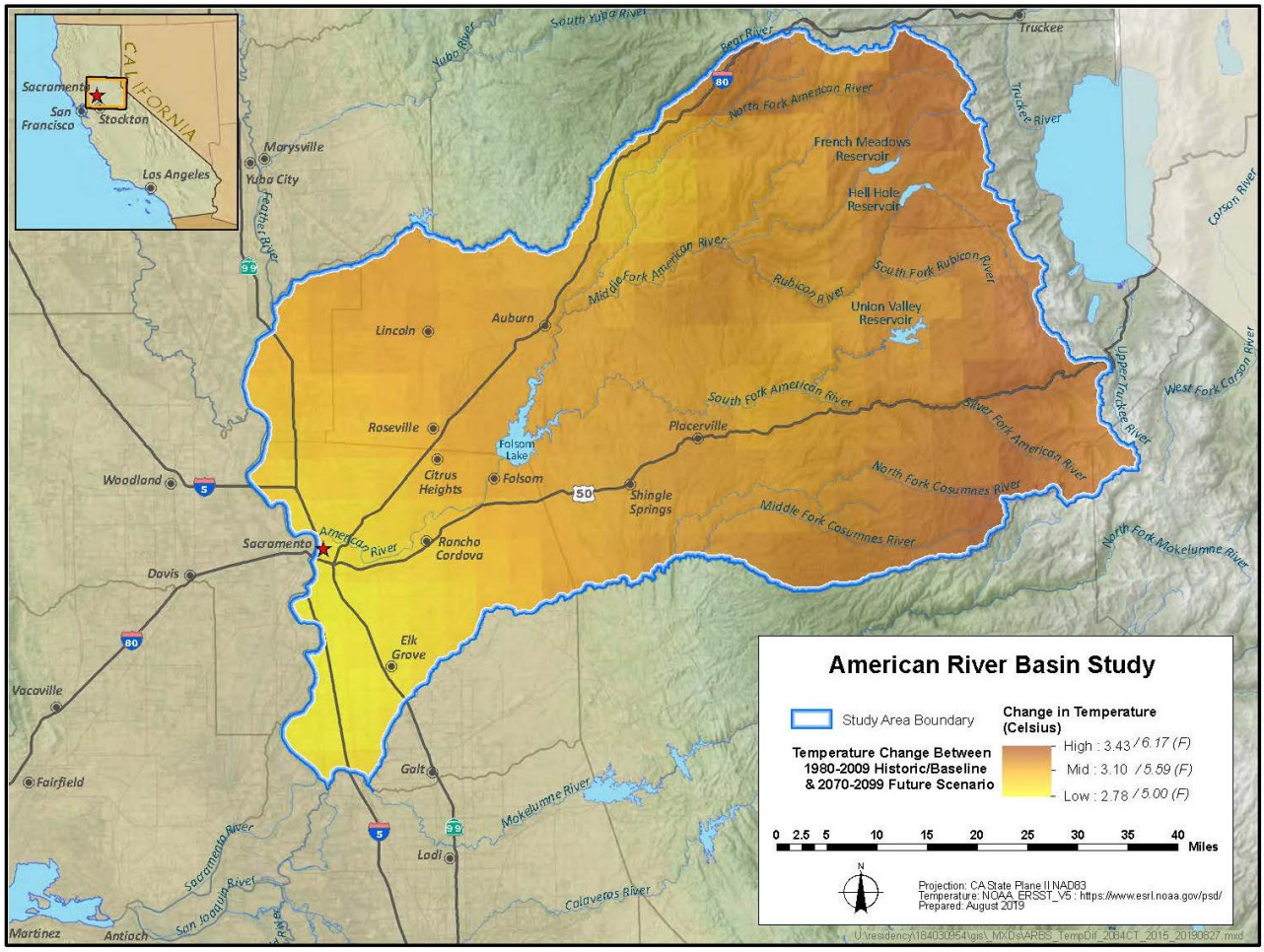


Figure 6-3 Projected Changes in July Temperature between Historical (1980-2009) and End of Century Under Central Tendency Climate Change

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.

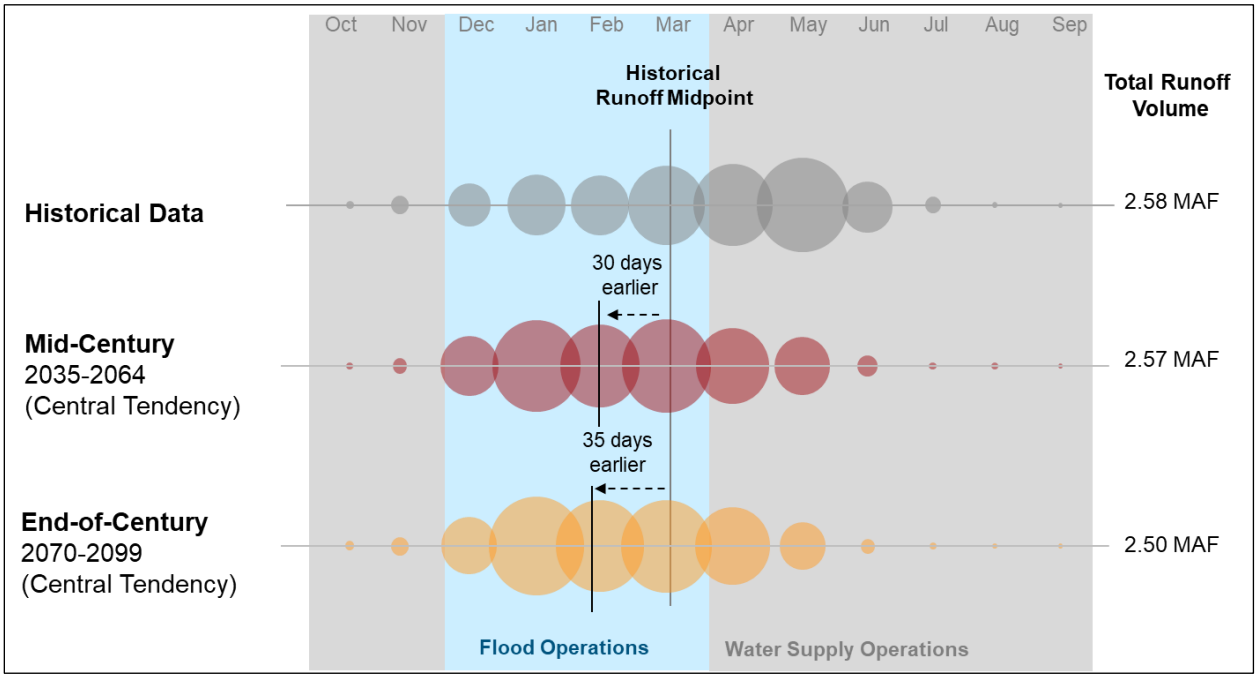


Figure 6-4: Distribution of Average Monthly Runoff for Historical Record (1922-2015) and Future Projections Under Central Tendency Climate Scenario

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.

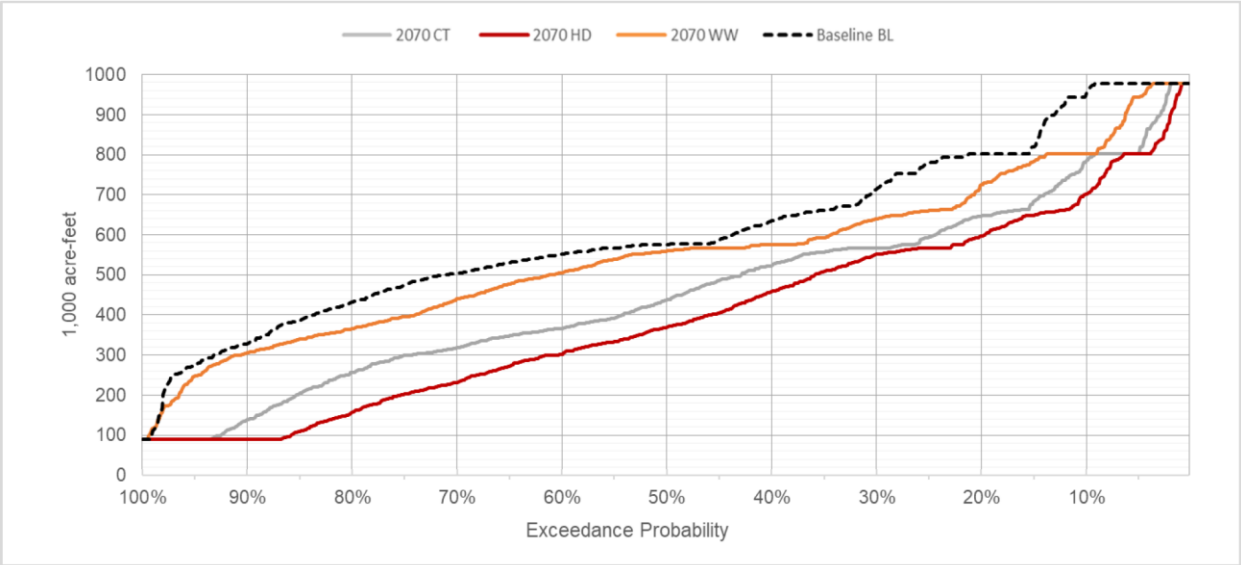
COR Table 6-C Change in Hydrologic Indicators Between Historical Observations and Projected Future Hydrology

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.

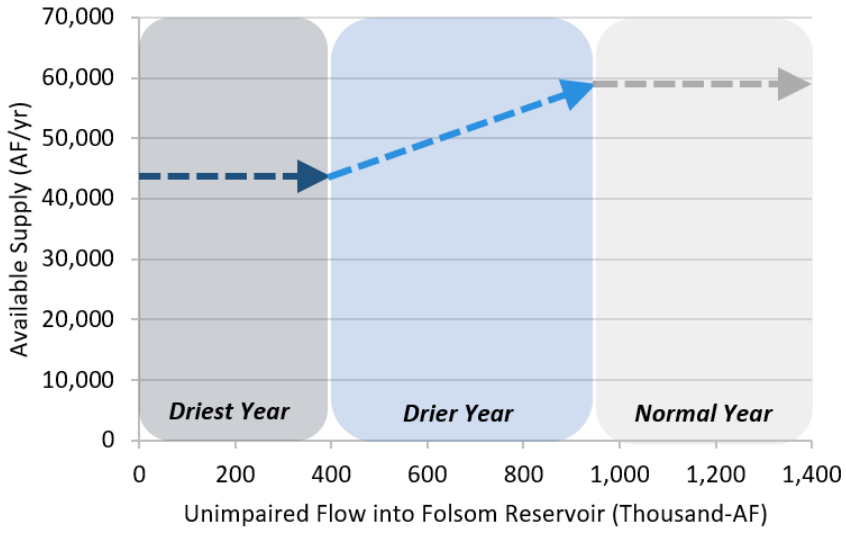


Figure 7-1 Water Forum Agreement Supply Limitations

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.

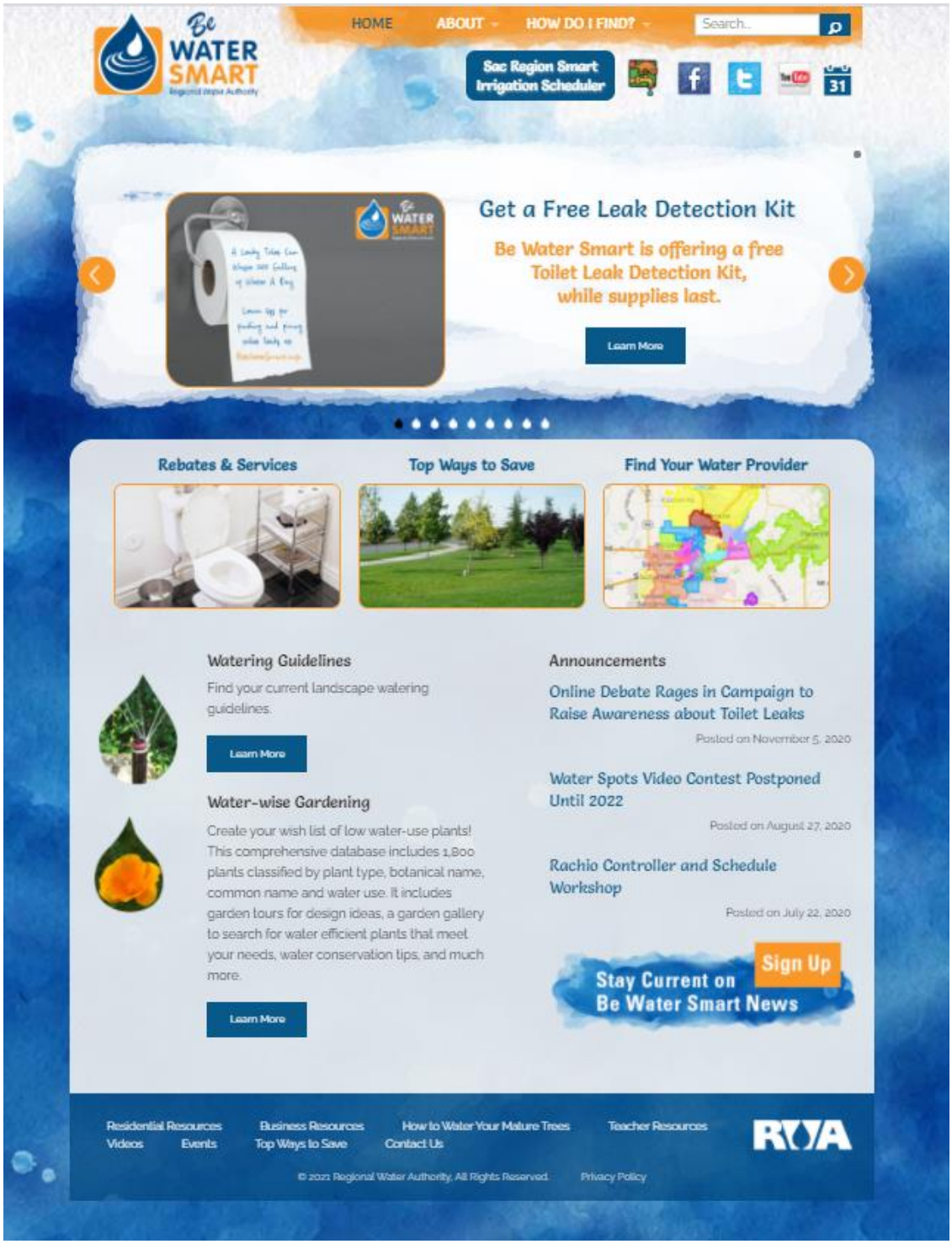
To support public outreach messaging and water savings tips, the Program also coordinated several regional rebate programs, which were partially funded by state and federal grants. A variety of rebate options were provided including toilets, clothes washers, and irrigation efficiencies (full summary 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. A copy of the published Notice of Public Hearing is 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.

On June 16, 2021, public hearings for the Urban Water Management Plan and Water Shortage Contingency Plan were held. The public hearings provided an opportunity for all City water users and the public to become familiar with the Urban Water Management Plan and Water Shortage Contingency Plan and to ask questions about the plan's contents. In addition, the hearings presented 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 and Water Shortage Contingency Plan were made available for public inspection on the City's website in advance of the public hearings.

Following the public hearings, adoption hearings for the Urban Water Management Plan and Water Shortage Contingency Plan were held on June 16, 2021 and were each adopted by City Council in separate resolutions. A copy of the adoption resolution for the 2020 Urban Water Management Plan is provided in Appendix O.

The adopted Water Shortage Contingency Plan is included as Appendix K of this Urban Water Management Plan and a copy of the adoption resolution is provided in Exhibit C of the Water Shortage Contingency Plan.

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.