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2025 Urban Water Management Plan

City of SACRAMENTO

Prepared By:

Trinity Consultants

ZANJERO ADVISE • MANAGE • SOLVE

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City of Sacramento

Zanjero

This 2025 Urban Water Management Plan was prepared under the direction of a California licensed civil engineer.

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Executive Summary
Layperson's Description

After the devastating drought in the late 1970s, the California Legislature declared California's water supplies a limited resource, subject to ever-increasing demands and that the long-term, reliable supply of water is essential to protect California's businesses, communities, agricultural production, and environmental interests. The Legislature also recognized a need to strengthen local and regional drought planning and increase statewide resilience to drought and climate change. Thus, in 1983, the California Legislature created the Urban Water Management Planning Act (UWMPA).[1] The UWMPA requires urban water suppliers serving over 3,000 customers or supplying at least 3,000 acre-feet of water annually to prepare and adopt an urban water management plan every five years,[2] and demonstrate water supply reliability in a normal year, single dry year, and droughts lasting at least five years over a twenty-year planning horizon.[3] The UWMPA also requires each urban water supplier to prepare a drought risk assessment and water shortage contingency plan.[4] And last, beginning in July 2022, each urban water supplier must prepare an annual water supply and demand assessment.[5] The California Legislature asserts that aggregating all of these legal requirements at the urban water supplier level will improve local, regional, and statewide water planning and water resilience.

At a practical level, the Urban Water Management Plan (UWMP) is the legal and technical water management foundation for urban water suppliers throughout California. A well-constructed UWMP provides the supplier's elected officials, management, staff, and customers with an understanding of past, current, and future water conditions and management. The UWMP integrates local and regional land use planning, regional water supply, infrastructure, and demand management projects as well as providing for statewide challenges that may manifest through climate change and evolving regulations. Thoughtful urban water management planning provides an opportunity for the supplier to integrate

[1] California Water Code (CWC) §10610 *et seq.* (Chapter 1 added by Stats. 1983, Ch. 1009, Sec. 1).
[2] CWC §10610 *et seq.*
[3] CWC §§10631-10635
[4] CWC §§10632
[5] CWC §§10632.1

supplies and demands in a balanced and methodical planning platform that addresses short- and long-term planning conditions. In brief, the UWMP gathers, characterizes, and synthesizes water-related information from numerous sources into a plan with local, regional, and statewide practical utility.

ES-1 City of Sacramento

Located at the confluence of the Sacramento River and American River, the City of Sacramento has grown from Gold Rush origins into California's capital and a major metropolitan center. The City's municipal water supply dates to 1849, with the development of California's oldest publicly owned municipal water system, that established a long legacy of water stewardship. Today, water service is provided by the City's Department of Utilities (DOU), which supplies potable water to a diverse mix of customers within the City's municipal service area and adjacent areas within the City's water entitlements' Place of Use. The City also partners with several regional entities to provide wholesale water supply and maintains interties for emergency supply exchange with neighboring agencies. The City's water service area is shown in **Figure ES-1**.

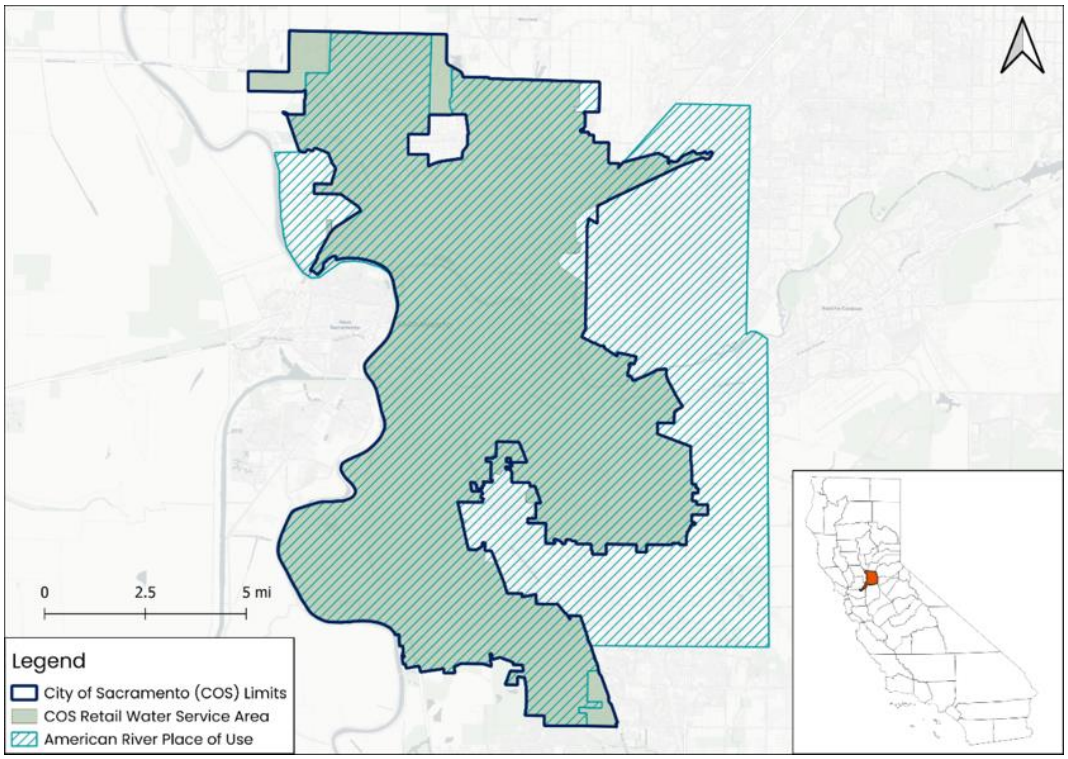


FIGURE ES-1: WATER SERVICE AREA

The City relies on surface water from the Sacramento River and American River watersheds, supplemented by groundwater from the North American Subbasin and South American Subbasin of the Sacramento Valley Groundwater Basin. The City of Sacramento's long-term water management strategy emphasizes regional climate adaptation and watershed resiliency through diversification of supplies, conjunctive use, and coordinated regional partnerships. Increasing hydrologic variability, declining Sierra Nevada snowpack, and more frequent extreme events are addressed by actively managing surface water and groundwater across multiple watersheds and basins. As both a retail and wholesale water supplier, the City's planning framework considers the reliability needs of wholesale customers and integrates future needs into its long-range supply and planning strategies.

The City is a signatory to the Water Forum and Water Forum 2050 Agreements, which establish regionally coordinated commitments to protect the Lower American River while maintaining reliable water supplies through conjunctive use, groundwater stabilization, and adaptive operations. Regional resiliency is further strengthened by participation in the Sacramento Regional Water Bank, which is designed to store water underground during wet years for use in dry years. Recharge and groundwater banking supports drought response, environmental flow needs in the rivers and Delta, and long-term supply reliability. The City's long-term water planning strategy is focused on balancing growth with climate adaptation, environmental stewardship, and wholesale and retail service reliability.

This combination of surface water, groundwater, treatment plants, wells, storage, and transmission infrastructure is important for the operational flexibility needed to serve both current needs and anticipated future growth. Capital improvement planning and new water supply, treatment, conveyance, storage and groundwater projects are critical investments that strengthen system redundancy and maintain reliable retail and wholesale service under future climate and regulatory uncertainty.

ES-2 City of Sacramento Water Service Reliability

The purpose of this UWMP is to verify that the City of Sacramento can reliably meet projected retail and wholesale water demands under a range of hydrologic conditions through 2050. The City is in a position with sufficient water supplies to meet current and growing customer demands. With multiple surface water assets and conjunctive use of groundwater, the City can maintain reliability during drought conditions.

As required by the UWMPA, the reliability assessment includes evaluation of water supply availability and projected water uses in normal, single dry, and five consecutive dry year conditions. The City prepared a Drought Risk Assessment (DRA) that integrates supplies and projected (unconstrained) dry year demands and considers system constraints such as

diversion limitations and groundwater pumping constraints. The DRA results show that the City has sufficient water assets available under a five-year drought scenario.

Over the recommended 25-year planning horizon, the City's reliability assessment considers constraints on sources and reflects the City's integrated management of its supplies. Overall, as presented in the UWMP's reliability findings, the City of Sacramento has a diverse water supply portfolio that satiates water demands in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050, assuming active management of its supply portfolio.

While the UWMP's analyses demonstrate long term reliability under the statutory planning scenarios, actual future conditions can differ due to hydrologic variability, evolving regulatory requirements, and other constraints. For that reason, the City's approach relies not only on long range planning, but also on operational flexibility across surface water and groundwater sources. The City will continue to evaluate current supply and demand conditions and perform an annual water supply and demand assessment (AWSDA) pursuant to California Water Code §10632.1. Procedures are contained in the City's Water Shortage Contingency Plan (WSCP), and the City will continue this planning exercise to determine near term reliability. The City has updated its WSCP as required by California Water Code §10632 and will implement actions as needed to respond to drought or other water shortage conditions.

Chapter 1
Introduction

At the confluence of the Sacramento and American Rivers, the City of Sacramento (City) has grown from Gold Rush origins into California's capital and a thriving metropolitan area serving over 520,000 residents. Sacramento's municipal water supply dates back to 1849 when its founders established the City's first water diversion from the Sacramento River, leading to the creation of California's oldest publicly owned water supply system in 1854. This early recognition of the importance of a dependable and safe municipal supply established a legacy of water stewardship that continues today.

As the seat of state government and a major economic center, modern Sacramento encompasses diverse sectors including healthcare, education, technology, and agriculture. The City's continued growth, guided by the 2040 General Plan, envisions thoughtful development across opportunity areas from downtown revitalization to expanding suburban communities. However, this prosperity depends fundamentally on reliable water supplies and infrastructure to serve existing and future residents while enabling sustainable expansion in a region characterized by variable precipitation and competing water demands.

Water serves as the foundation for all municipal services, economic development, and quality of life in Sacramento. This 2025 Urban Water Management Plan (UWMP) provides a comprehensive roadmap for ensuring water supply reliability through 2050 and beyond. It evaluates existing water supplies, projects future demands, and outlines strategies to sustain water system resilience and security. This document serves as more than a regulatory requirement—it is a strategic document that guides decision-making about infrastructure planning, land use decisions, and resource management policies, ensuring that Sacramento's water supports both current and future generations.

1.1. Background and Purpose

The Urban Water Management Planning Act (UWMPA) was enacted by the California Legislature in 1983 to address the growing need for comprehensive water supply planning across the state's urban areas. Codified in California Water Code sections 10610-10656, the UWMPA requires urban water suppliers serving more than 3,000 customers or delivering more than 3,000 acre-feet annually to prepare and adopt comprehensive water management plans every five years. The City has prepared this 2025 UWMP to comply with the UWMPA

requirements and support the City's water management planning efforts to assure surface and groundwater supplies are available to meet forecasted retail and wholesale demands over a long-term planning horizon.

As required by the UWMPA, this 2025 UWMP specifically assesses the availability of the City's supplies to meet forecast water uses during average, single-dry, and five consecutive drought years through 2050. Verification that future demands will not exceed supplies and assuring the availability of supplies in dry-year conditions are critical outcomes of this plan. The 2025 UWMP is an update to the City's 2020 UWMP and presents new data and analysis as required by the California Department of Water Resources (DWR) and the California Water Code (CWC or Water Code). Since there have been no updates to the UWMPA since 2020, this UWMP reflects new guidelines and incorporates best practices for water planning in the current regulatory landscape. This comprehensive water planning document describes existing and future supply reliability, forecasts future water uses, presents demand management progress, updates the City's Water Shortage Contingency Plan (WSCP), and identifies local and regional cooperative efforts to meet projected water use.

The UWMP is designed to be a valuable water management and planning tool to guide and inform the City's managers, customers, and the State of California about Sacramento's water management practices. It reflects the City's planning assumptions and goals and should be used in combination with other planning resources and documents over the UWMP planning horizon, representing Sacramento's continued commitment to responsible water stewardship and proactive strategies that protect and preserve the City's water assets, ensure water supply reliability, and promote community and regional prosperity.

1.2. Basis for Plan Preparation

The City operates a Public Water System as described in California Health and Safety Code 116275. The City qualifies as a Retail Urban Water Supplier as described in CWC Section 10617, providing water for municipal purposes to more than 3,000 customers or 3,000 acre-feet of water per year. This qualification requires the preparation of an Urban Water Management Plan every five years.

The City's Public Water System details are listed in

Table 1-1.

TABLE 1-1: PUBLIC WATER SYSTEM INFORMATION

Public Water System Number	Public Water System Name	Number of Municipal Connections 2025
CA3410020	City of Sacramento Main	~143,000

The State Legislature adopted numerous new requirements for the 2020 UWMP cycle that continue to apply to this 2025 UWMP. However, there have been no additional statutory changes to UWMP requirements between 2020 and 2025. As such, this plan utilizes a similar comprehensive framework that was established in the 2020 UWMP. Major requirements implemented in 2020 and continued in this 2025 UWMP are listed below along with references to the corresponding sections where they are addressed in this document.

Five Consecutive Dry-Year Water Reliability Assessment: Dry-year water reliability planning must be assessed for a "drought lasting five consecutive water years". This statute requires the City to analyze the reliability of its water supplies to meet its water use over an extended drought period. This requirement is addressed in Chapter 3—Water Supply Characterization, Chapter 4—Water Use, and Chapter 5—Water Service Reliability Assessment.

Drought Risk Assessment (DRA): Due to the extensiveness of recent California droughts and the variability associated with climate change predictions, the California Legislature created a DRA requirement for UWMPs.[6] The DRA requires assessment over a five-year period from 2026 to 2030 that examines water supplies, water uses, and the resulting water supply reliability for five consecutive dry years. The DRA is addressed in Chapter 5—Water Service Reliability Assessment and Chapter 6—Water Shortage Contingency Plan.

Seismic Risk: Evaluating seismic risk to water system infrastructure and facilities and having a mitigation plan is required by the Water Code.[7] Incorporating the water system into regional or county hazard mitigation planning is an important aspect of this statute. Seismic risk is addressed in Chapter 6.

Water Shortage Contingency Plan: The UWMPA requires a Water Shortage Contingency Plan (WSCP) with specific elements.[8] The WSCP is a document that provides the City with an action plan for a drought or catastrophic water supply shortage. The WSCP is included in summary form in Chapter 6 of this UWMP and Appendix A in its entirety.

[6] CWC §10635(b)
[7] CWC §10632.5
[8] CWC §10632

Groundwater Supplies Coordination: UWMPs are required to be consistent with Groundwater Sustainability Plans following the 2014 Legislature enactment of the Sustainable Groundwater Management Act (SGMA). The City's groundwater supplies are described in Chapter 3—Water Supply Characterization.

Lay Description: A synopsis of the fundamental determinations of the UWMP is a statutory requirement. This section is intended for new staff, new governing members, customers, and the media, and ensures a consistent representation of the City's detailed analysis.

1.3. Coordination and Outreach

The City has complied with the UWMPA by engaging in proactive coordination with local and regional agencies to ensure a consistent, transparent, and regionally integrated approach to water resource planning. Coordination and communication among agencies are essential for maintaining the reliability, resilience, and sustainability of the region's water supplies. In accordance with CWC Section 10620(d)(3), the City coordinated the preparation of this 2025 UWMP and WSCP with local and regional agencies that share common water sources, manage related infrastructure, or have land use and resource planning responsibilities within or adjacent to the City's service area. Coordination was also conducted among City departments to ensure internal consistency with other planning efforts, including the General Plan and Water Master Plan. The City views this UWMP iteration as a necessary component of its Climate Adaptation and Watershed Resilience program. The City further coordinates with the Sacramento Area Sewer District, which provides wastewater conveyance and treatment services.[9]

The City participates extensively in regional coordination and planning efforts that support regional water resiliency, climate change adaptation, and integrated water management. The City is an active member of the Regional Water Authority (RWA), which represents most of the water providers in the greater Sacramento area and facilitates regional supply planning, drought preparedness, and advocacy on statewide water issues. The City also participates in the Sacramento Groundwater Authority (SGA) and the Sacramento Central Groundwater Authority (SCGA), which oversee groundwater management in the North American and South American Subbasins, respectively. Both agencies are responsible for implementing Groundwater Sustainability Plans (GSPs) that ensure long-term groundwater basin health.

[9] The Sacramento Area Sewer District merged with Sacramento Regional County Sanitation District January 1, 2024 and operates a consolidated sewer utility.

The City of Sacramento has furthered its regional stewardship by participating in federal and state initiatives. The City is engaging in the pending Healthy Rivers and Landscapes Program (HRL Program) under the State Water Board's July 2025 Draft Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Watershed.

The United States Bureau of Reclamation (USBR or Reclamation), the City of Sacramento, and several cities and water agencies in the region partnered to complete the American River Basin Study (ARBS) that developed data, tools, analyses, and climate change adaptation strategies specific to the American River Basin.[10] The ARBS examined strategies to integrate and better coordinate local and Federal water management practices to improve regional water supply reliability, while assessing Folsom Reservoir operations to meet flow and water quality standards in the Sacramento-San Joaquin Delta (Delta) and to protect fish species in the Lower American River.

The City is deliberately addressing supply reliability with a comprehensive strategy that addresses risk with a focus on planning, stakeholder engagement, and water management strategies to maintain resiliency and redundancy of supplies across watersheds and groundwater basins. This Climate Adaptation and Watershed Resilience commitment balances long-term water supply reliability with ongoing commitment to public trust resources and environmental stewardship.

In tandem with the 2040 General Plan, the City of Sacramento City Council unanimously adopted the Sacramento Climate Action & Adaptation Plan (CAAP), on February 27, 2024. The CAAP includes goals and actions on water supply and resiliency that incorporate findings from studies like the ARBS and developed an adaptation and action plan that aligns interests with regional water providers and stakeholders for the purpose of improving water supply reliability, availability, and quality in response to climate change.

In addition to these partner agencies and initiatives, the City is a signatory to the Water Forum Agreement, a landmark regional consensus adopted in 2000 that brings together water agencies, environmental groups, business representatives, and local governments to achieve two coequal objectives: (1) provide a reliable and sustainable water supply for the region's long-term needs, and (2) preserve and enhance the environmental values of the Lower American River. The Water Forum serves as a model of cooperative regional water management, guiding groundwater stabilization, surface water use, and habitat restoration programs. Continued participation in the Water Forum ensures that the City's planning remains aligned with regional sustainability goals, environmental stewardship commitments,

[10] U.S. Bureau of Reclamation, American River Basin Study: Interior Region 10 – California Great Basin, August 2022

and the implementation of conjunctive use and drought resilience strategies throughout the Sacramento region. An effort began in April of 2020 to update the Water Forum Agreement, a process in which the City played a leadership role.

The City of Sacramento is a signatory to the recently completed Water Forum 2050 Agreement and its associated Purveyor Specific Agreement. These updated commitments establish a long-term, adaptive framework for balancing water supply reliability with environmental stewardship on the Lower American River. Water Forum 2050 builds on the original 2000 Agreement by explicitly recognizing recent indicators of climate change, hydrologic variability, and the critical role of conjunctive surface water and groundwater management. The agreement emphasizes flexible, year-to-year operational responses; regional coordination through groundwater sustainability and water banking; and continued investment in resilient infrastructure, while reaffirming that Water Forum commitments complement existing water rights and regulatory authorities.

The Water Forum 2050 Agreement maintains the two coequal objectives of providing reliable water supply and protecting the lower American River while incorporating updated strategies to address climate change, regulatory demands, and economic pressures. City Council approved the Water Forum 2050 Agreement and the City's Purveyor Specific Agreement on March 17, 2026.[11] The Water Forum 2050 Final Agreement was signed in April 2026.[12]

1.3.1. Water Supplier Information Exchange

In accordance with Water Code Section 10631(h), the City provided information regarding available water supplies to neighboring and retail agencies that currently receive—or may receive—wholesale water from the City. The City does not rely on a wholesale supplier for its own water supply; however, it has agreements to provide wholesale service to several regional entities. These include the Sacramento County Water Agency, Sacramento Suburban Water District, California American Water Company, Golden State Water Company, and the Natomas Unified School District.

Consistent with the UWMPA, the City also requested demand projections and related planning information from these agencies for incorporation into this UWMP and regional planning efforts. This exchange of data supports consistency across water suppliers that share interconnected infrastructure or common groundwater and surface water resources. These coordination activities ensure that regional planning assumptions remain aligned, that

[11] https://waterforum.org/uncategorized/city-of-sacramento-approves-water-forum-2050-agreement/
[12] https://rwah2o.org/wp-content/uploads/2026/03/6.0-Support-1-WF2050-FINAL-Draft_2026_02_20.pdf

wholesale and retail projections are mutually understood, and that the City's planning framework supports efficient and reliable service to all customers.

1.3.2. Statutory Requirements for Notice

In compliance with Water Code Section 10621(b), the City provided notification to all affected cities and counties at least 60 days prior to the public hearing on this UWMP update. Additionally, the City conducted outreach to community stakeholders and encouraged the involvement of diverse social, cultural, and economic elements within the service area, as required under Water Code Section 10642. These efforts reflect the City's ongoing commitment to public transparency and engagement in water resource planning. A summary of these notifications is provided in

Table 1-2, and copies of the notification letters are included in Appendix B.

TABLE 1-2: PUBLIC AND AGENCY COORDINATION TABLE 1-2.

Coordinating Agencies	Coordinate Regarding Demands	Sent Copy of Draft UWMP	60-Day Notice	Notice of Public Hearing
Sacramento County Water Agency	X	X	X	X
Sacramento County – Planning & Environmental Review			X	X
Regional Water Authority	X	X	X	X
Sacramento Groundwater Authority			X	X
Sacramento Central Groundwater Authority			X	X
California American Water Company	X	X	X	X
Sacramento Suburban Water District	X	X	X	X
Sacramento Regional County Sanitation District			X	X
Sacramento Area Sewer District			X	X
Rio Linda/Elverta Community Water District			X	X
Natomas Central Mutual Water Company			X	X
Florin County Water District			X	X
Tokay Park Water District			X	X
Golden State Water Company	X	X	X	X
City of West Sacramento			X	X
Sacramento County LAFCo			X	X
Water Forum	X	X	X	X
General Public			X	X

In compliance with Water Code Section 10621(b), the City notified the entities listed in **Table 1-2** regarding its intent to update and adopt this 2025 UWMP. The notification was provided more than 60 days prior to the scheduled public hearing, fulfilling statutory requirements.

Furthermore, consistent with Water Code Section 10642, the City encouraged public participation by providing notice of the hearing date, time, location, and methods for accessing the draft UWMP. Notifications were published in local newspapers and sent directly to interested stakeholders to promote inclusive community involvement in the plan's development. The plan was also made available on the City's website: https://www.cityofsacramento.gov/utilities/reports

1.4. Public Hearing, Adoption, and Submittal

In compliance with Water Code Section 10642, the City held a publicly noticed hearing on June 16, 2026, to review and consider adoption of the 2025 UWMP and associated WSCP. The hearing provided an opportunity for community members, partner agencies, and regional stakeholders to comment on the proposed Plan. Following public input, the City Council formally adopted the 2025 UWMP and WSCP by resolution.

Consistent with Water Code Section 10644(a), the adopted Plan was submitted within 30 days to the California State Library, the Cities of Sacramento and West Sacramento, and the County of Sacramento. In addition, the City electronically submitted the Plan and all required data tables to the California DWR prior to the regulatory deadline of July 1, 2026, thereby completing all statutory submittal requirements.

1.5. Document Organization

This 2025 UWMP is organized as follows:

Executive Summary provides an overview of the purpose and findings of this 2025 UWMP.

Chapter 1 establishes the basis for the UWMP, describes the outreach activities and introduces the document organization.

Chapter 2 provides a description of the City's service area, system description, demographic characteristics, climate, energy intensity, and describes the future population the City anticipates needing to serve.

Chapter 3 describes the current and future water supplies and the availability of the supplies through 2050.

Chapter 4 details the customer uses, including the past and future estimated uses, and describes the City's past and on-going demand management measures.

Chapter 5 presents the City's water system service reliability into the future, including an assessment of reliability if a drought occurred over the next five consecutive years.

Chapter 6 is the summary of the City's stand-alone Water Shortage Contingency Plan, incorporated as a chapter in this UWMP. The full WSCP is included in Appendix A and is available to be shared and utilized separate from the UWMP.

Chapter 7 contains the City's water conservation program overview and demand management measures.

NOTE TO DWR:

The City of Sacramento has prepared this Urban Water Management Plan (UWMP) primarily as a water resources planning tool to effectively manage water supply, reliability and demand. This UWMP also satisfies all the requirements of the Urban Water Management Planning Act (UWMPA).

The body of the document provides narratives, analysis and data that DWR requests in its 2025 UWMP Guidebook, including changes to the California Water Code since 2020. Efforts have also been made to include enhancements to this document wherever possible as recommended in the 2025 UWMP Guidebook.

To facilitate review by DWR for compliance with the UWMPA, data from the body of the document has been transferred into required DWR submittal tables consistent with the organization of the tables in Appendix E of the 2025 UWMP Guidebook. These tables are separately uploaded to DWR's web portal. This UWMP has been reviewed for adequacy according to the UWMP Checklist as contained in Appendix F in the 2025 UWMP Guidebook.

Chapter 2
Water Service and System Description

Situated at the confluence of the Sacramento and American Rivers in northern California, the City of Sacramento (City) spans roughly 101 square miles within Sacramento County. The community lies in the heart of the Sacramento Valley, an expansive alluvial plain that forms part of the greater Central Valley watershed. Regional hydrology is shaped by runoff from the Sierra Nevada and Coast Ranges, conveyed through the broader Sacramento River system, its series of storage reservoirs, as well as localized recharge within the surrounding groundwater basins.

The City's service area overlies the North American Subbasin and South American Subbasin, both part of the larger Sacramento Valley Groundwater Basin. These subbasins are characterized by thick, water-bearing alluvial deposits that provide an important and reliable groundwater resource for urban and agricultural uses. The Sacramento and American Rivers form the primary surface water sources for the City's supply system. Collectively, the rivers and underlying basins form an integrated hydrologic system that supports both surface and subsurface supplies for the City and the region.

Water service is provided by the City's Department of Utilities (DOU), which supplies potable water to a diverse mix of residential, commercial, industrial, and institutional customers within the city limits and several adjacent unincorporated areas. Land uses within the service area range from historic urban neighborhoods and high-density downtown developments to suburban residential communities and mixed-use commercial corridors. Residential customers represent the majority of service connections, primarily single-family and multifamily dwellings, while non-residential users include retail centers, offices, hospitals, schools, and state government facilities.

As a full-service municipal utility, DOU oversees water supply, treatment, distribution, and system maintenance to ensure safe and reliable service that meets all state and federal water quality standards. The integrated system combines surface and groundwater supplies through a network of treatment plants, wells, storage reservoirs, and transmission pipelines. This infrastructure supports both current demands and future growth consistent with the City's General Plan, regional sustainability goals, and long-term resource management strategies.

Table 2-1 shows the historical and current service connections by customer class.

TABLE 2-1: RETAIL CUSTOMER WATER SERVICE CONNECTIONS (METERED)

Customer Class	2020	2021	2022	2023	2024	2025
Single-Family Residential	120,051	122,228	123,340	124,038	124,749	125,473
Multi-Family Residential	9,027	9,707	9,689	9,775	10,012	10,032
Commercial/Institutional/Industrial	7,089	7,135	7,200	7,235	7,275	7,280
Landscape Irrigation	2,261	2,369	2,425	2,484	2,574	2,618
Other	0	0	0	0	0	0
Total	**138,428**	**141,439**	**142,654**	**143,532**	**144,610**	**145,403**

The DOU also oversees operation and maintenance of the City's wastewater collection and storm drainage systems. While the City collects and conveys wastewater from residential, commercial, and industrial customers, treatment and disposal are provided by the Sacramento Area Sewer District (SacSewer) at the EchoWater Resource Recovery Facility (EchoWater), formerly identified as the Sacramento Regional Wastewater Treatment Plant, located near Elk Grove, south of the City along the Sacramento River. The EchoWater Facility provides advanced tertiary treatment for wastewater generated throughout the metropolitan region, discharging treated effluent to the Sacramento River in compliance with state and federal water quality standards. Coordination between the City and SacSewer ensures reliable, compliant wastewater service across the service area.

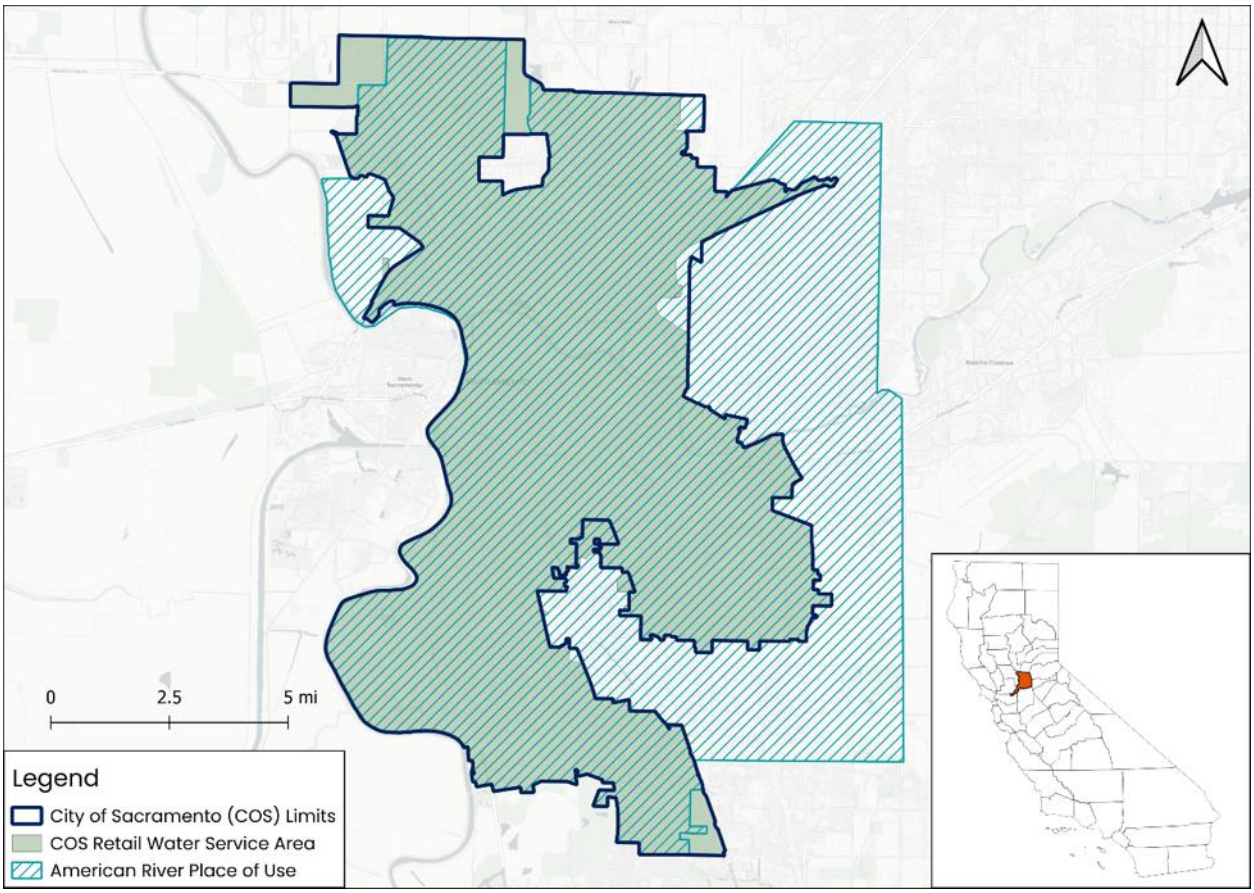
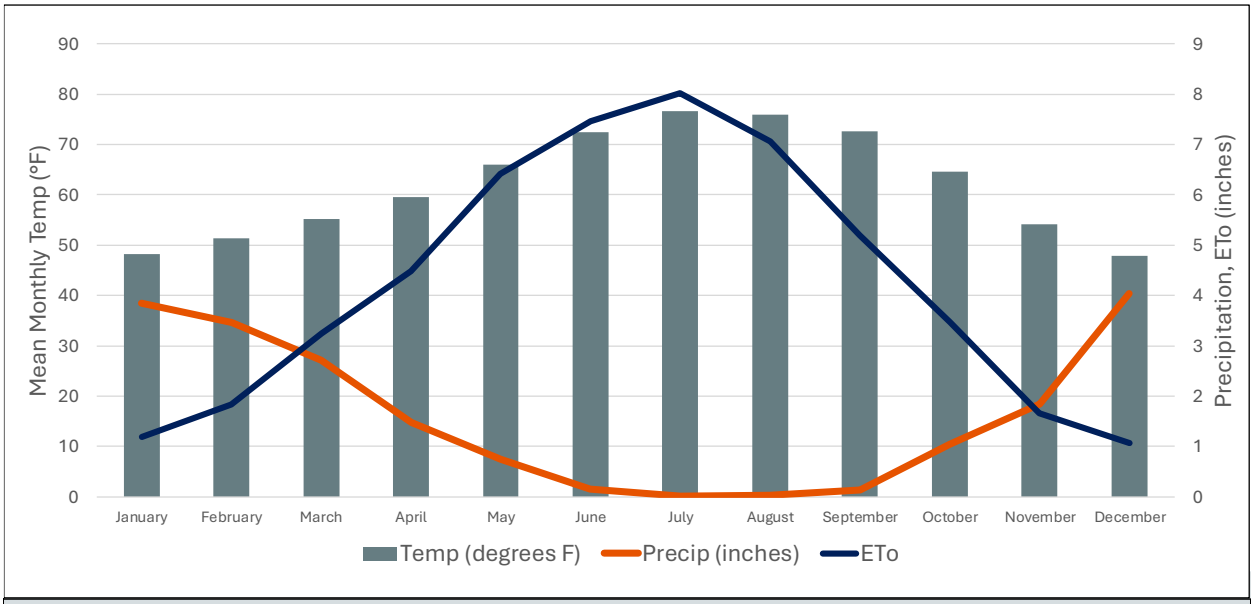


FIGURE 2-1: WATER SERVICE AREA

2.1. Service Area Climate

The City of Sacramento's service area is located in the heart of the Sacramento Valley, approximately 90 miles northeast of San Francisco. The region is characterized by a Mediterranean climate with hot, dry summers and mild, wet winters. Annual temperatures average around 62°F. Annual precipitation averages approximately 20 inches, with the wettest months typically occurring from December through February. During this time, winter temperatures average around 49°F, with overnight lows frequently dropping into the upper 30s to low 40s. The warmest months are July and August, with average summer highs reaching approximately 93°F, and daily maximum temperatures routinely exceeding 90°F.

Figure 2-2 shows the average monthly temperature, rainfall, and evapotranspiration (ETo) for the service area. Reference ETo rates fluctuate inversely with temperature, annually averaging approximately 51 inches.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp	48.2	51.3	55.2	59.6	66.1	72.5	76.6	75.9	72.7	64.6	54.2	47.8
Precip	3.84	3.46	2.71	1.47	0.73	0.15	0.00	0.03	0.13	1.04	1.84	4.03
ETo	1.19	1.83	3.24	4.49	6.42	7.47	8.03	7.06	5.19	3.46	1.66	1.06

FIGURE 2-2: AVERAGE CLIMATE CONDITIONS[13]

2.1.1. Climate Characteristics

The California Water Code recognizes climate change as an important consideration for water suppliers assessing drought risk, water conservation and use efficiency, and demand management and supply. The City is on the cutting-edge of climate issues through the City's Climate Adaptation and Watershed Resilience framework.

Precipitation patterns in the Sacramento region, shown in **Figure** 2-3, show considerable variability and uncertainty in future projections. While annual precipitation totals may not change dramatically, climate projections suggest a shift toward more intense, less frequent precipitation events.[14]

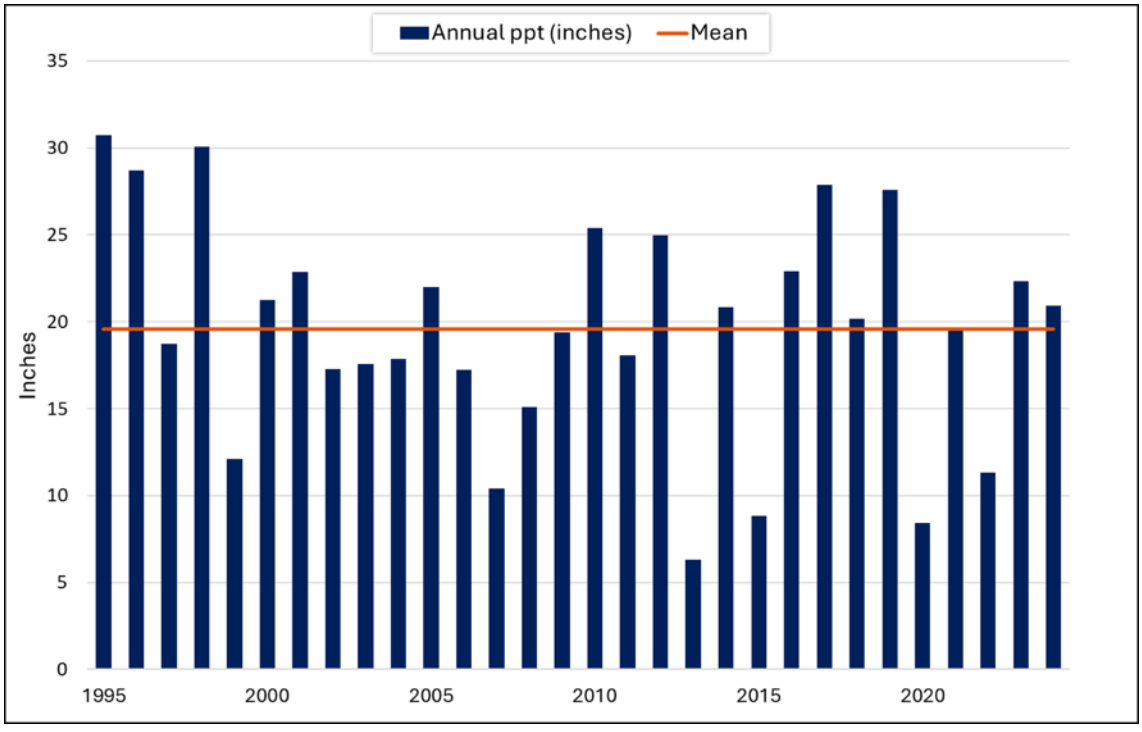
As shown by the trendlines in **Figure** 2-4, the region has experienced gradual warming, with annual temperatures having increased by approximately 2°F since the mid-20th century. This

[13] Temperature and rainfall data represents annual averages from 1995-2024 from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 38.5820 Lon: -121.4898 Elev: 23ft; ETo data is from CIMIS Fair Oaks - Sacramento Valley - Station 131, Jan 1995-Nov 2025.

[14] See Chapter 7.1. *Projected Future Conditions* of the American River Basin Study (ARBS), a collaborative project between USBR and regional partners to develop basin-specific climate change adaptation strategies.

warming trend will likely continue, with potential temperatures increasing by 4-7°F by the end of the century.[15] Warming temperatures contribute to a decline in the Sierra Nevada snowpack, more precipitation falling as rain rather than snow, and earlier snowmelt – all of which fundamentally alter runoff patterns and water supply availability. As a result, flows into reservoirs will be higher during winter months. However, much of this additional flow cannot be stored effectively as reservoirs approach critical operational thresholds and face stricter flood control levels during the winter.[16] Given the City's reliance on imported water from upstream watersheds, any effect from climate change on Sierra Nevada snowpack and flows into Northern California reservoirs will have a serious impact on water availability for the City. Additional discussion regarding the potential effects of climate change and the City's Climate Adaptation and Watershed Resilience approach are included in Chapter 3, Chapter 4, and Chapter 5.

On the demand side, increasing temperatures and longer, more intense heat waves are likely to increase outdoor water demands even as conservation measures continue to improve efficiency. Demand is discussed in depth in Chapter 4.



[15] ARBS

[16] See Section 1. *Reasons to Assess SWP Water Delivery Capability* of the Delivery Capability Report published by DWR for 2023

FIGURE 2-3: ANNUAL PRECIPITATION VARIABILITY (1920-2025)

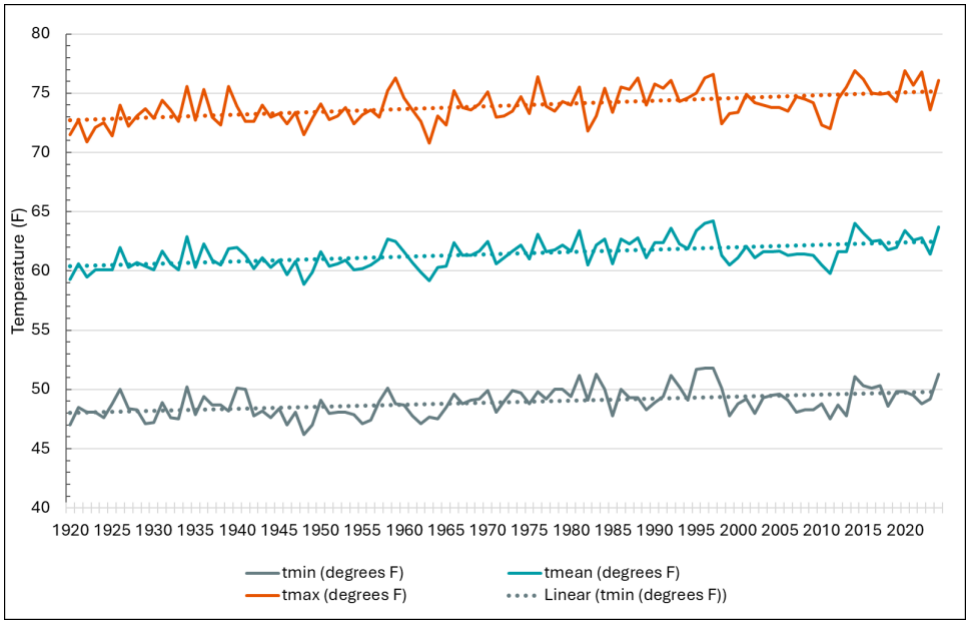


FIGURE 2-4: HISTORICAL ANNUAL AVERAGE TEMPERATURE (1920-2025)[17]

2.2. Service Area Boundaries and Jurisdictions

The City of Sacramento provides both retail water service within its service area boundaries and wholesale supply within the City's water rights place of use. This section describes the City's service area and its wholesale customers, including jurisdictions and wholesale water supply arrangements.

2.2.1. Service Area Overview

A secure and robust water supply has been essential for the City's development and continues to underpin sustainable growth and economic expansion. The City operates the oldest public municipal water system in California. As both a retail provider and a water wholesaler, the City provides water to a population of over 527,000 residents, maintains close to 147,000 customer service connections, and has a retail service area of approximately 101 square miles.

[17] Temperature data is from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 39.1239 Lon: -121.6174 Elev: 56ft

2.2.2. Retail Service Area

The City's water system delivers treated potable water to residential, commercial (office and mixed use), public/institutional, industrial, irrigation, and other (utilities, parking, misc.) customers within its retail water service area. Retail water service is provided primarily within the corporate limits of the City of Sacramento. The City's retail customers represent a diverse mix of land uses, including low- and high-density residential neighborhoods, commercial corridors, industrial districts, and civic and institutional facilities that reflect the City's role as the capital of California.

While most retail customers are located within City limits, the Department of Utilities also provides water service to a limited number of customers in adjacent, unincorporated areas of Sacramento County. Conversely, a small portion of residents within City boundaries receive water service from the Sacramento Suburban Water District (SSWD); the populations of these two areas are approximately equivalent. In addition, the Sacramento Power Authority (SPA) Cogeneration (Cogen) Facility, located outside City limits, receives both potable and recycled water supplies from the City through dedicated interconnections.

The City's retail water service area has varying density while future development and infill are expected to occur consistent with the City's General Plan. The City also anticipates the service area to continue to grow and the service area boundary to be augmented throughout the planning horizon of the UWMP and well beyond.

Current growth projections gathered from the 2040 General Plan and 2023 Water Master Plan identify 68 designated Opportunity Areas distributed within and around the City that represent potential residential, commercial, and mixed-use development zones. These areas are expected to accommodate both population and employment growth over the next two decades.

The City's municipal retail water service area boundaries are generally consistent with the City's boundary. However, wholesale water service is supplied consistently with the place of use (POU) under its appropriative and pre-1914 water rights that includes adjacent areas authorized for service under State Water Resources Control Board (SWRCB)-approved maps extending outside of current City limits. Future updates to the POU may be coordinated with SWRCB and the Water Forum to reflect changes in land use or boundary adjustments associated with annexations or retail and wholesale service extensions.

2.2.3. Wholesale Service Area

In addition to retail water service within City limits, the City of Sacramento provides wholesale water deliveries to neighboring agencies and customers in Sacramento County through a

series of long-term agreements. Wholesale supplies are delivered primarily from the City's surface water treatment plants via dedicated interties and transmission mains. Wholesale customers include the Sacramento County Water Agency (SCWA), Sacramento Suburban Water District (SSWD), California American Water (Cal Am), and the Natomas Unified School District (NUSD), with potential for others in the future. These partnerships support regional water supply reliability, optimize surface water use under the City's American River and Sacramento River rights, and enhance regional water resources during varying hydrologic conditions. The City also treats and wheels water to Sacramento County Water Agency's Zone 40. Wholesale customer water use is described in Chapter 4.

Much of the wholesale delivery area is defined by the authorized POU for the City's American River water rights. Moreover, the City is a stalwart of regional water supply reliability in its capacity as a water wholesale provider and retail service provider. The City's water entitlements are discussed further in Chapter 3.

The City currently delivers wholesale water through several metered turnouts that border the City's retail service area. The City uses the same surface water treatment facilities, groundwater wells, storage tanks, pumping facilities, and distribution/transmission pipelines to deliver water to wholesale customers. The turnouts are in addition to emergency connections that the City has with adjacent agencies.[18] The City's wholesale and wheeling customers are described below. A map of current wholesale customers and their service areas is shown in **Figure 2-5**.

Sacramento County Water Agency

The Sacramento County Water Agency (SCWA) was established in 1952 and provides water service to portions of Sacramento County through multiple zones of benefit. The City of Sacramento maintains both wheeling and wholesale water supply agreements with SCWA, under which the City treats and conveys potable water to SCWA service areas using City transmission and treatment facilities.

Under the 2000 Wheeling Agreement[19], the City treats and conveys SCWA-owned surface water supplies for use within portions of SCWA's service areas, including the Laguna and Vineyard areas historically associated with Zone 40, via an interconnection near Franklin Boulevard at the southern boundary of the City. Deliveries under this agreement constitute wheeled water and are not considered wholesale sales of City water.

[18] The City maintains numerous emergency interties with agencies around its service area. Not all are identified in this wholesale agency section.

[19] Agreement for Use of Sacramento River Water Treatment Plant Facilities to Wheel Surface Water, dated April 4, 2000.

Under the 2004 Wholesale and/or Wheeling Water Service Agreement[20], the City provides long-term potable water service to the Sacramento International Airport and Metro Air Park (MAP) area through a separate interconnection located at Bayou Road near the airport. Water deliveries under this agreement may occur either as wholesale deliveries of City water or as wheeled deliveries of SCWA-owned water, depending on the source of supply. Within SCWA, the Airport and MAP service area is operated as part of SCWA's retail system and is associated with Zones 41 and 50, with Zone 50 established primarily to fund capital facilities serving MAP. The City and SCWA have multiple interconnections to the Northgate service area and are exploring service deliveries to this area. Another unmetered emergency intertie for the SCWA airport region at Meister Way is currently under construction as of the writing of this UWMP.

Water delivered to SCWA is recorded and reported by the City based on service area and/or turnout location, including deliveries to the Laguna/Vineyard area, Sacramento International Airport, and Metro Air Park. Only deliveries of City water are classified as wholesale supplies; wheeled water is excluded from wholesale demand accounting.

Contractually, the 2000 Wheeling Agreement establishes a maximum wheeling capacity of up to 11 MGD (12,322 AFY). The 2004 Airport/Metro Air Park Agreement establishes an initial operational delivery capacity of up to 5 MGD (5,600 AFY), expandable to a maximum of 11.7 MGD (13,106 AFY) with at least 18 months advance notice from SCWA and completion of required facilities and fee payments.

Separately, the City and SCWA entered into a 2014 Emergency Water Service Agreement to allow temporary emergency deliveries from SCWA to the City during the City's Water Treatment Plants Rehabilitation Project. This agreement provides an emergency-only backup supply and remains separate from the City's wholesale and wheeling agreements. The City and SCWA are also party to the ARTESIAN Agreement described later in this section.

Sacramento Suburban Water District

The Sacramento Suburban Water District serves approximately 180,000 residents in four service areas within Sacramento County.[21] Under a 2004 wholesale water supply agreement, the City provides up to 20 million gallons per day (MGD) (22,400 AFY) of American River surface water, plus an additional 10 MGD under certain conditions. Water deliveries to SSWD's South Service Area (SSA) began in 2007, consistent with the American River Place of Use

[20] "Agreement Between the City of Sacramento, the County of Sacramento and the Sacramento County Water Agency for Wholesale and/or Wheeling Water Service for Sacramento International Airport and Metro Air Park", dated October 12, 2004.

[21] City of Sacramento, *Water Master Plan Update* (2023)

(POU). The City and SSWD maintain seven interties, including a primary delivery intertie near Howe Avenue and Northrop Drive and six additional connections used for emergency and operational support.

Also prompted by the City's Water Treatment Plants Rehabilitation Project in 2013, SSWD and the City entered into a similar emergency agreement, which allows SSWD and the City to assist in times of need. Since the preparation of the 2020 UWMP, SSWD now serves the Del Paso Manor Service Area (DPMSA), following the dissolution of Del Paso Manor Water District.

California American Water Company

California American Water, a subsidiary of American Water, operates ten service areas within Sacramento County serving approximately 225,000 residents.[22] The City provides wholesale supply to the Arden, Parkway, Suburban, Rosemont, and Fruitridge Vista service areas.

The City and Citizens Utilities Company of California (CUCC) first entered into a wholesale agreement in 1997 for the Parkway area. As the successor to CUCC, Cal-Am modified this agreement in 2010 to establish both firm and non-firm capacity deliveries, providing 2.3 MGD (2,580 AFY) of firm supply and 3.46 MGD (3,880 AFY) of non-firm supply during off-peak periods (October 15 through May 14), with deliveries not to exceed 4,831 AFY.[23] Deliveries may be made to any of the three eligible service areas within the POU. The 2010 agreement with Cal-Am supersedes their inherited 1977 agreement, previously referred to as the Southgate Agreement.

In February of 2020, Cal-Am acquired the Fruitridge Vista Water Company (FVWC), previously served by the City under a separate wholesale contract. The City's 2007 wholesale agreement with FVWC transferred to Cal-Am Fruitridge upon acquisition. The new Cal-Am Fruitridge service area, now substantially built out, receives a firm capacity of 3.24 MGD (3,630 AFY) under an agreement that allows for reductions during certain hydrologic conditions.

The City maintains five active interconnections serving Cal-Am:

- "A" Parkway and Franklin Boulevard (Parkway Service Area)
- Terminal end of a 24-inch main on Folsom Boulevard (Rosemont Service Area)
- 47th Avenue (western edge of Cal-Am Fruitridge Service Area)
- Fruitridge Boulevard and Sampson Avenue (Cal-Am Fruitridge Service Area)
- Howe Avenue and Alta Arden Expressway (Arden Service Area).

[22] City of Sacramento, *Water Master Plan Update* (2023), West Yost.
[23] Ibid.

In addition to the active interconnections, there are five emergency interties to the Cal-Am Fruitridge Vista area, three emergency interties south of the Cal-Am Fruitridge Vista area, and one emergency intertie shared with Sac Suburban Water District in the Arden Service Area.

Natomas Unified School District

In 2019, the City entered into a wholesale agreement with the Natomas Unified School District (NUSD) to provide a maximum of 0.245 mgd, or about 274 acre-feet annually, of water supply to the Paso Verde K–8 School located just outside the City limits. The service connections are located near the intersection of Snelling Lane and Westlake Parkway at the edge of the City limits. The City provides wholesale deliveries to NUSD through standard retail connections but accounts for the use as wholesale.

ARTESIAN Agreement

The American River Terms for Ecosystem Support and Infrastructure Assistance Needs (ARTESIAN) project agreement was entered into by the Regional Water Agency (RWA), the City, and other RWA Members as part of the American River region's still pending "Volunteer Agreement" proposal associated with the State's Bay-Delta Water Quality Control Plan (see Chapter 3 for more discussion). ARTESIAN is one of the City's conjunctive use programs, designed to strategically coordinate usage of surface water and groundwater resources. The ARTESIAN agreement includes funding from DWR and California Natural Resources Agency (CNRA) for groundwater infrastructure projects. In return, the City and other participating RWA Members are required to make up to 30,000 acre-feet of water available to the ecosystem during a Call Year. A Call Year is a dry or critical water year when the State triggers the ARTESIAN program and requires participating agencies to use groundwater instead of surface water, leaving that surface water in the American River for environmental flows.[24]

The City also maintains an agreement with SSWD and SCWA to ensure surface water is available for environmental releases. SSWD and SCWA agree to reduce the City's surface water diversions under their respective wholesale agreements by either delivering pumped groundwater directly to the City, or foregoing use of the City's surface water under its water rights which the City would otherwise divert, treat, and provide to SSWD, SCWA, and its own customers. SSWD and SCWA would instead pump banked groundwater to make up these surface water supplies in Call Years, and surface water would not be diverted from American River and be left in-stream for environmental purposes.

[24] Dry and Critical year types under the ARTESIAN agreements are determined using the State's Sacramento Valley Index pursuant to the Revised SWRCB Decision 1641, and those classifications establish eligibility—but not an automatic requirement—for a Call Year.

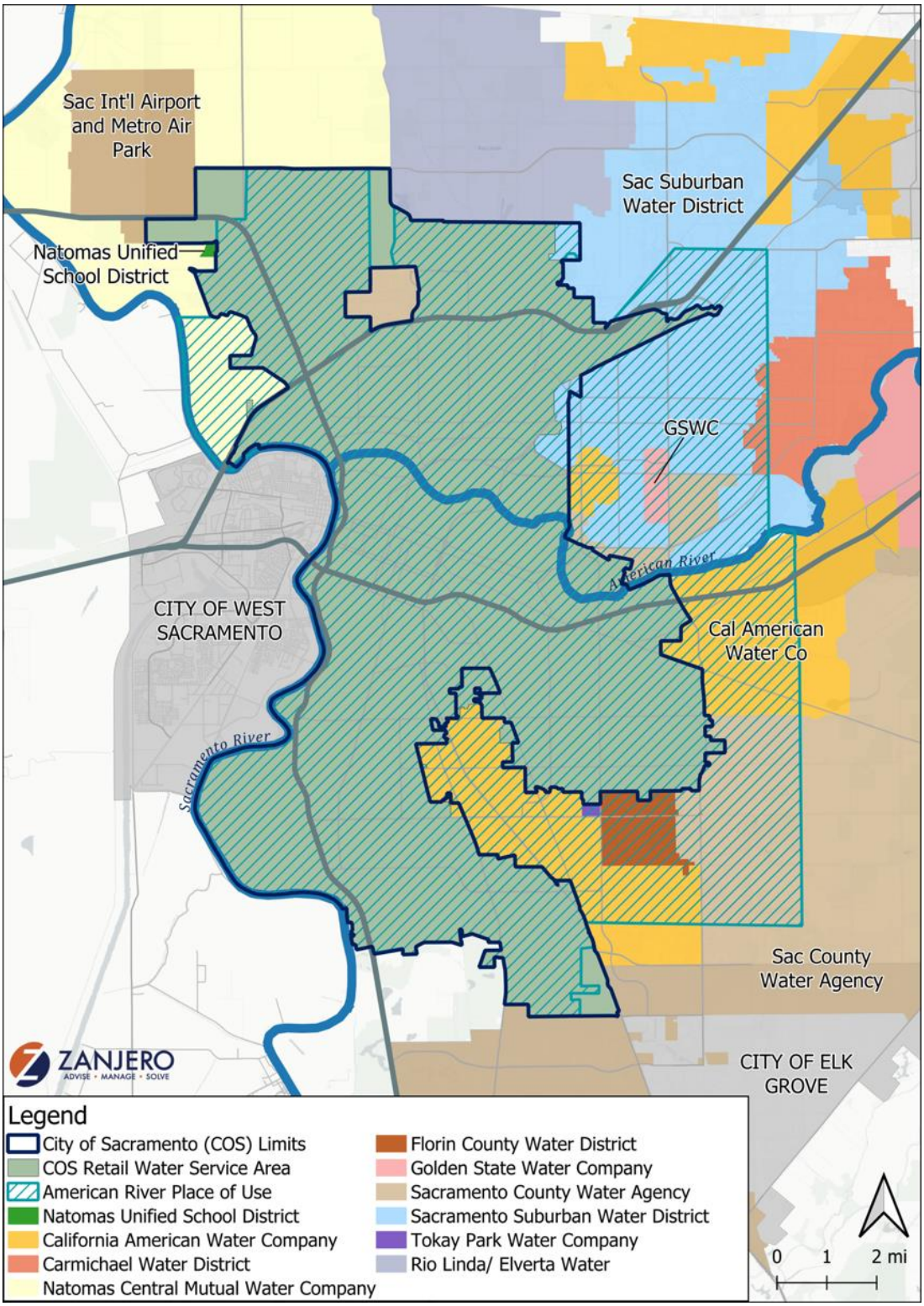


FIGURE 2-5: CITY AND WHOLESALE CUSTOMER SERVICE AREAS

Future Wholesale Customers

The City's wholesale demand is expected to increase to serve existing customers under current contracts and future agreements. For example, the City and SSWD discussed a potential surface water supply agreement to serve SSWD's North Service Area, which comprises the territory of the former Northridge Park County Water District. A 1979 agreement between the City and Northridge Park County Water District provided for up to 9,023 AFY of Area D American River supply, but that agreement was never activated and is considered by the City as expired. In 2018, the City expressed willingness to negotiate a new North Service Area supply agreement, subject to conditions including SSWD's assumption of applicable Area D service and water right permit costs, as well as environmental review and curtailment obligations. As of the drafting of this plan, an agreement has not yet been reached. For planning purposes, however, the City expects wholesale water service to SSWD's North Service Area, discussed below as Northridge, will eventually be established.

The 2023 Water Master Plan Update identifies additional future wholesale customers and demand, differentiated by those likely to receive water by 2030 based on master plans and agency communications, versus the capacities the City can provide to agencies within the American River POU by 2040.[25]

Expanding conjunctive use is an important part of the region's collective supply resiliency strategy. This is underscored by wide participation in the Sacramento Regional Water Bank (SRWB), led by Regional Groundwater Authority (RWA). The City and regional partners are coordinating on expanding conjunctive use and in-lieu recharge through the SRWB. Utilizing the City's surface water rights under wholesale arrangements to meet future demands in the American River Place of Use would allow the City's regional partners, including Cal-Am, Golden State, SCWA, SSWD, Carmichael Water District, and RWA, to bank groundwater through in-lieu recharge or aquifer storage and recovery (ASR) during favorable hydrologic conditions. More discussion on the SRWB can be found in Section 2.4 and Chapter 4.

Existing and potential wholesale customers are shown in **Table** 2-2 and discussed further in Chapter 4.

[25] City of Sacramento Water Master Plan Update, January 2023. Section 3.6.

TABLE 2-2: EXISTING AND POTENTIAL WHOLESALE CUSTOMERS[26][27]

Wholesale Entities	
Cal-Am	Cal-Am Arden
	Cal-Am Fruitridge Vista (47th and Sampson)
	Cal-Am Parkway
	Cal-Am Suburban (Folsom)
	Cal-Am Rosemont
SCWA	SCWA International Airport
	SCWA Zone 50 Metro Air Park
	SCWA Zone 40
	SCWA Arden Park*
	SCWA Northgate*
SSWD	SSWD Sac Suburban (Northrop)
	SSWD Sac Suburban (Arden)*
	SSWD Sac Suburban (Northridge)*
	SSWD Sac Suburban (Del Paso Manor)*
NUSD	Natomas Unified School District
Other	Golden State Water Company*
	Tokay Park*
	Florin County Water District*
	Carmichael Water District*

*Potential wholesale customers and/or service areas. The City does not currently deliver water to these areas within its American River POU but may in the future.

As previously discussed in Section 2.2.3, the City's wholesale water delivery area is defined by its American River water rights Place of Use. Future wholesale service not contemplated in **Table** 2-2, and which is beyond the 2050 UWMP planning horizon, is expected to expand and is addressed in a long-range planning assessment in Chapter 4.

[26] City of Sacramento, *Water Master Plan Update* (2023), Table 3-16.
[27] SCWA, 2020 UWMP (2021), Table 4-11.

2.3. Current and Projected Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework, as population dynamics and growth are a primary driver on water use. These projections directly influence planning decisions for system supply, delivery, infrastructure, and demand management. Similarly, understanding the City's economic, social, and demographic trends is requisite for water management and planning. This section of the UWMP addresses these factors to provide a supportable basis for forecasting future water use.

Developing these planning frameworks and growth projections begins with calculating an informed estimate of the City's current service area population, consistent with DWR requirements. There are multiple approaches to developing this estimate; however, because the City's boundaries correspond by 95% or more with the City's water service area, population estimates prepared by the California Department of Finance were used.

2.3.1. Current Population and Historic Trends

Formally established in 1849, the City grew rapidly from its origins as a supply hub during the Gold Rush. From a population of approximately 9,087 in 1850, the City grew rapidly and was designated as the permanent state capital in 1854. Its strategic location as a river port, agricultural processing center, and major rail hub following the completion of the transcontinental railroad in 1869 drove continuous population growth throughout the late nineteenth and early twentieth centuries. Early growth was characterized by infrastructure investments completed during the second half of the 1800s in response to catastrophic fires and repeated floods, with this subsequent rebuilding supporting residential and commercial growth. By the turn of the twentieth century, the expansion of streetcar lines enabled the growth of Sacramento's first suburban neighborhoods, extending the City outward.[28]

Following World War II, the City experienced rapid annexation and suburban expansion. The City's current boundaries encompass approximately 101 square miles. Today, Sacramento is the sixth largest city in California and the county seat of Sacramento County, with a current (2025) service area population of approximately 527,979, as estimated by the California Department of Finance.

[28] City of Sacramento, *City-Wide Historic Context* (Sacramento: City of Sacramento Planning Department, Urban Design & Preservation Division, 2019), PDF file, accessed February 14, 2026, https://www.cityofsacramento.gov/content/dam/portal/cdd/Planning/Urban-Design/Preservation/Adopted-Historic-District-Plans/City-Wide-Historic-Context.pdf

As previously mentioned, because the City's service area overlaps the municipal area by over 95%, California Department of Finance (DOF) population estimates were used to estimate service area population. Importantly, the differences in population values and growth rates between the 2023 Water Master Plan and the 2025 UWMP reflect the California Department of Finance's "Error of Closure" adjustment, which revised intercensal estimates for 2010–2020 to reconcile annual projections with actual 2020 Census counts. This recalibration redistributed the statistical difference between the Demographic Research Unit test estimates and census data across the decade, resulting in slightly different annual population figures and corresponding growth rates for the same historical years.

Historical population dating back to 1990 is shown in **Table** 2-3.

TABLE 2-3: HISTORICAL POPULATION[29]

1990	1995	2000	2005	2010	2015	2020	2025
369,365	383,720	406,397	442,662	466,488	487,984	520,252	527,979

Annual population growth rates over the 2015–2025 period have generally ranged from approximately 0.3 to 1.6% per year, with a brief contraction of -0.88% in 2020, likely reflecting Census-period methodology and COVID-19 related demographic shifts, followed by continued moderate positive growth through 2025. **Table** 2-4 presents these annual population values and growth rates.

TABLE 2-4: POPULATION GROWTH RATE, YEARS[30]

2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
487,984	492,275	498,376	504,737	511,893	520,252	515,673	518,333	521,871	526,327	527,979
1.09%	0.88%	1.24%	1.28%	1.42%	1.63%	-0.88%	0.52%	0.68%	0.85%	0.31%

[29] 1990-2025 data from State of California, Department of Finance, E-8 Historical Population and Housing Estimates for Cities, Counties, and the State, 1990-2000 (August 2007), 2001-2010 (November 2012), 2010-2025 (May 2025). 2020-2025 data from State of California, Department of Finance, E-4 Population Estimates for Cities, Counties, and the State, 2021-2025, with 2020 Census Benchmark. Sacramento, California, May 2025.

[30] 2015-2025 data from State of California, Department of Finance, E-8 Historical Population and Housing Estimates for Cities, Counties, and the State, 2010-2025 (May 2025). 2020-2025 data from State of California, Department of Finance, E-4 Population Estimates for Cities, Counties, and the State, 2021-2025, with 2020 Census Benchmark. Sacramento, California, May 2025.

2.3.2. Projected Population

To forecast projected service area population as accurately as possible requires consideration of the past growth rate, local economic predictions, and current and projected land uses. The UWMP Act states urban water suppliers "shall coordinate with local or regional land use authorities" regarding land uses that may affect water management planning.[31]

The City's projected population is estimated using residential growth forecasts from the City's 2040 General Plan, updated to include actual census counts for 2025 and growth associated with new developments within the City limits that were not previously considered. More specifically, the City's 2040 General Plan and Climate Action & Adaptation Plan forecasted the construction of 69,012 new residential units by 2040.[32] This approximation was then updated to include 1,163 new residential units associated with the Stone Beetland Development, which can be translated to an increase in population by assuming a factor of 2.573 people per dwelling unit.[33] This occupancy rate is obtained from DOF 2025 E-5 population estimates table for the City of Sacramento. Housing units and population counts from this table for 2025 were also used as a stepping-stone, adjusting the rate of increase in housing units presented in the General Plan to reflect existing conditions. Although one other development, Aspen 1, was proposed within the City limits, the City indicated that this development will be industrial with no associated residential growth.[34] The resulting population is presented in **Table** 2-5.

TABLE 2-5: POPULATION FORECAST, 2025-2050

2025	2030	2035	2040	2045	2050
527,979	577,372	623,856	670,339	716,823	763,306

Looking forward, the City's retail service area population is projected to reach approximately 577,372 by 2030 and 670,339 by 2040, consistent with the adjusted growth projections from

[31] CA Water Code Section 10631(a)

[32] City of Sacramento, *Sacramento 2040 Project Master Environmental Impact Report* (Sacramento: City of Sacramento Community Development Department, 2023), PDF file, accessed February 14, 2026. https://www.cityofsacramento.gov/content/dam/portal/cdd/Planning/General-Plan/2040-General-Plan/Sacramento-2040-Project-MEIR-8242023.pdf

[33] The project site is located in south Sacramento and is generally bounded by Cosumnes River Boulevard to the south, Morrison Creek to the east, the extension of 24th Avenue to the west, and adjacent City-owned vacant land to the north, and includes the Morrison Creek Sacramento Regional Transit light rail station.

[34] The Aspen 1-New Brighton project is an approved 232-acre mixed-use development at Jackson Road and Watt Avenue in Sacramento.

the City's 2040 General Plan. These projections reflect infill development and development within the City's designated opportunity areas.

Not considered within this projection are longer-horizon growth associated with potential developments outside of the City's service area and municipal boundary. One such development, the Natomas Joint Vision Study Area (NJVA), was previously considered theoretically in the 2023 Water Master Plan Update and was anticipated to support a 2040 projection of approximately 695,830 people. Were the City to provide services to the Natomas Joint Vision Study Area, or other land uses described in Section 2.3.3, or if others should arise, this population forecast would be updated to reflect additional service area population associated with these areas. At this time, no growth in this area is characterized in this UWMP.

When considering a long-range planning horizon beyond the 2050 UWMP range, the City could expect continued growth with infill, higher density developments, annexations, and population shifts that could realistically eclipse one million people within the City boundaries by the end of the century.

2.3.3. Current and Projected Land Use

This section examines the current and projected land uses within both the City's retail and wholesale service areas. To maintain consistency with past and current demand projection efforts, the methodology used in the 2023 Water Master Plan largely served as the basis for the preparation of this document. Thus, the foundational components of that methodology including projected land uses within the retail and wholesale areas discussed within this section align with those presented in the 2023 Water Master Plan.

Current Land Use Within the Retail Service Area

The City of Sacramento has served as a hub for recreation, business, and transportation since the Gold Rush. As detailed in the City's 2040 General Plan, development was historically centered around the Sacramento River but expanded significantly following the completion of various flood control projects. The City is now approximately 86% developed within its current boundaries, with the dominant land use being residential[35]. The breakdown of existing land uses is presented in **Figure** 2-6, and **Figure** 2-7 shows the current City structure.[36]

[35] 2023 Water Master Plan Update

[36] Both figures sourced from the Land Use and Placemaking Element of the City's 2040 General Plan

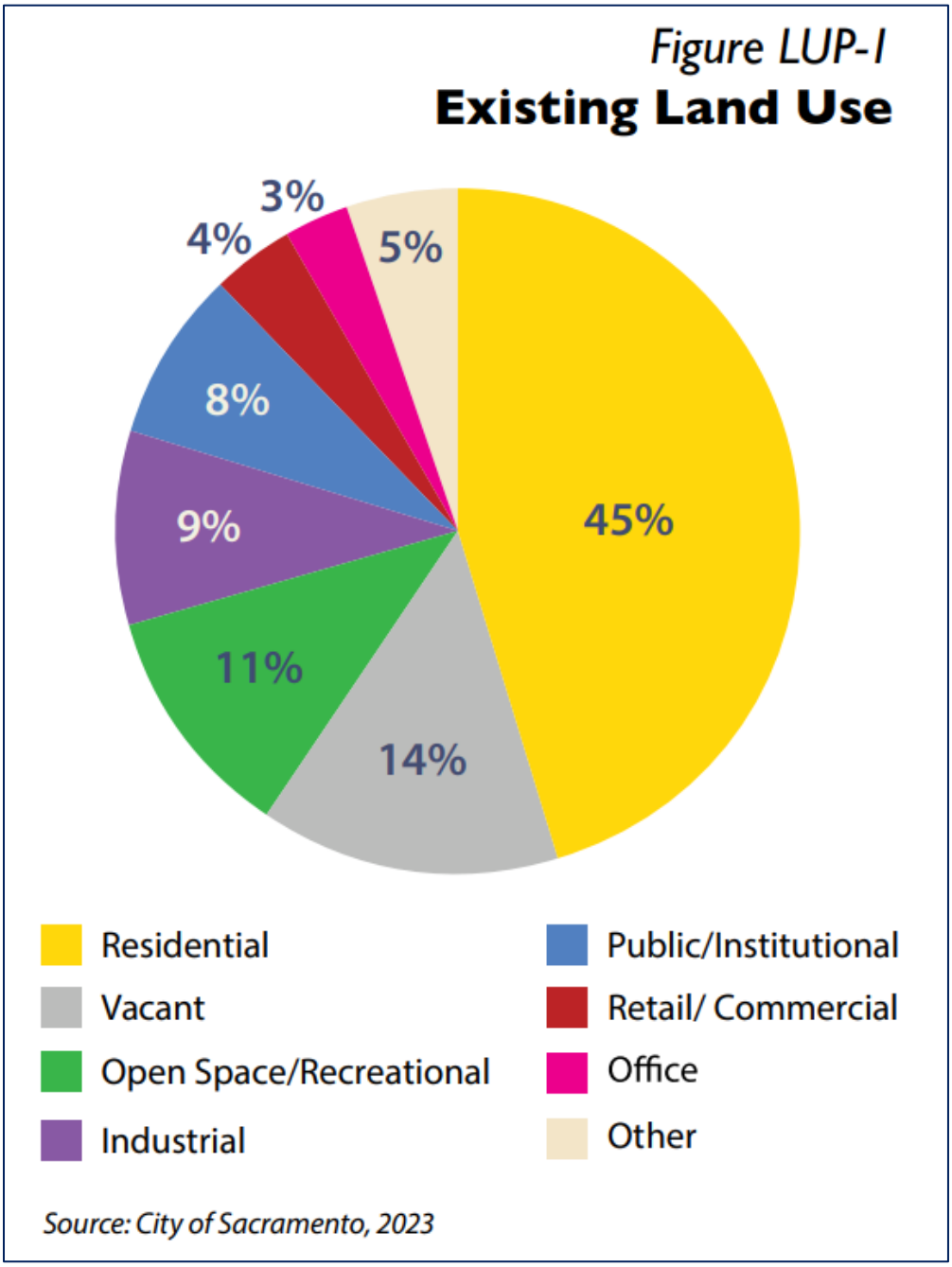


FIGURE 2-6: EXISTING LAND USE PIE CHART (2040 GENERAL PLAN)

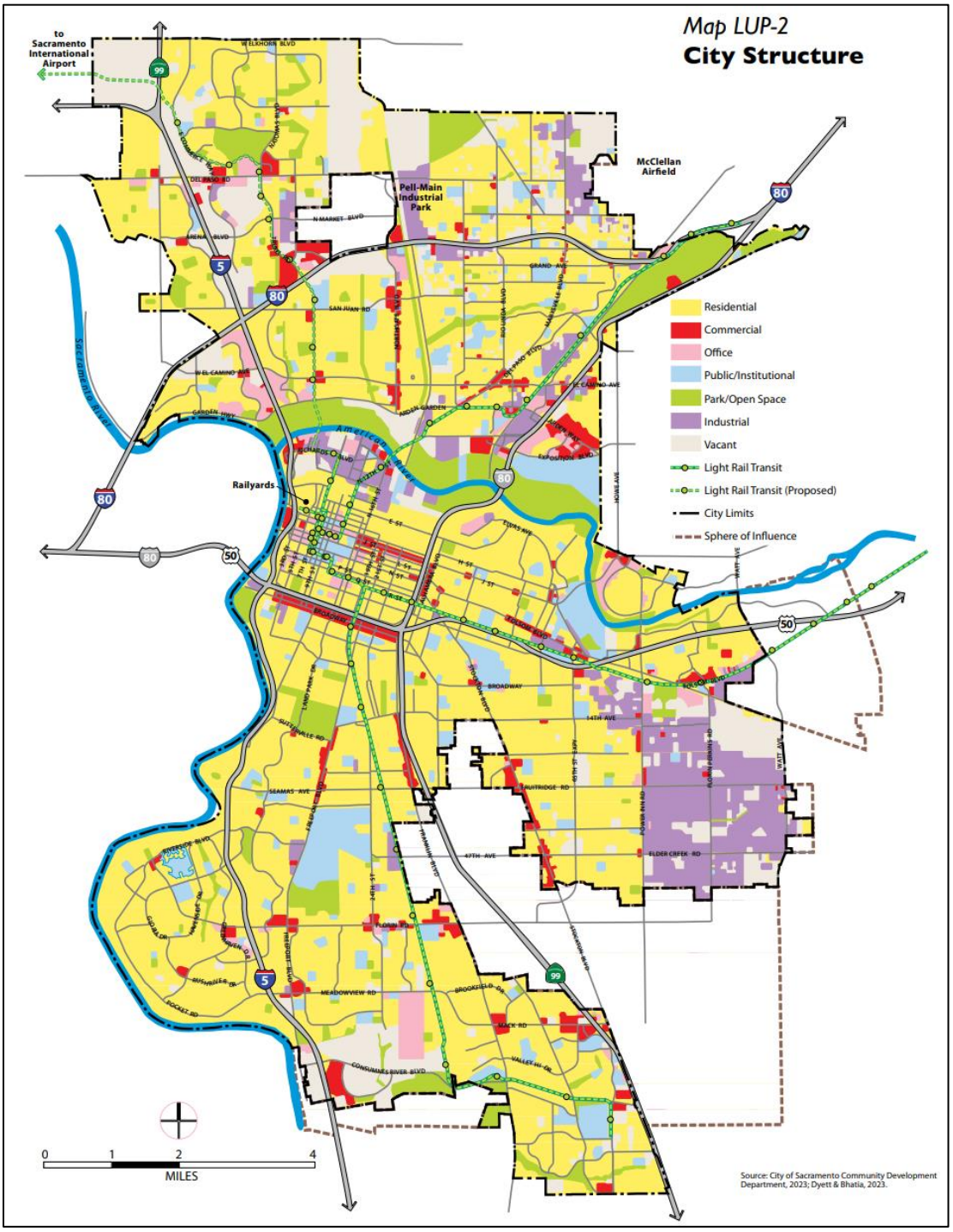


FIGURE 2-7: EXISTING LAND USE MAP (2040 GENERAL PLAN)

Projected Land Use Within the Retail Service Area

The City of Sacramento's land use planning framework is guided by its 2040 General Plan, which envisions a more connected, sustainable, and equitable urban form supported by efficient water and infrastructure systems. The City's Land Use Concept Map (**Figure** 2-8) illustrates how future growth is anticipated to occur within 59 defined Opportunity Areas that concentrate new development along major transportation corridors, near light rail stations, and within established employment centers.[37] Since then, two additional proposed developments have been identified.

The concept emphasizes infill and redevelopment within existing City limits rather than outward expansion, aligning with regional growth management and climate action goals. Central City remains the region's civic and economic core, supported by a network of mixed-use corridors such as Stockton Boulevard, Broadway, Florin Road, Franklin Boulevard, Arden Way, Del Paso Boulevard, Marysville Boulevard, Northgate Boulevard, Mack Road, and Truxel Road that will accommodate higher-density residential and commercial uses. Employment centers are distributed throughout the city, including office districts near the Sacramento International Airport and production/service areas in the Power Inn and Florin-Perkins industrial zones.

Neighborhood areas comprise most of the City's developed land and are expected to experience gradual reinvestment and small-scale infill. By focusing growth within existing infrastructure service areas, the Land Use Concept supports long-term water system sustainability, efficient use of existing facilities, and coordinated capital improvement planning consistent with the 2023 Water Master Plan.

[37] Opportunity Areas are referenced from the 2023 Water Master Plan Update and while related, do not necessarily simulate Opportunity Areas as identified in the City's 2040 General Plan.

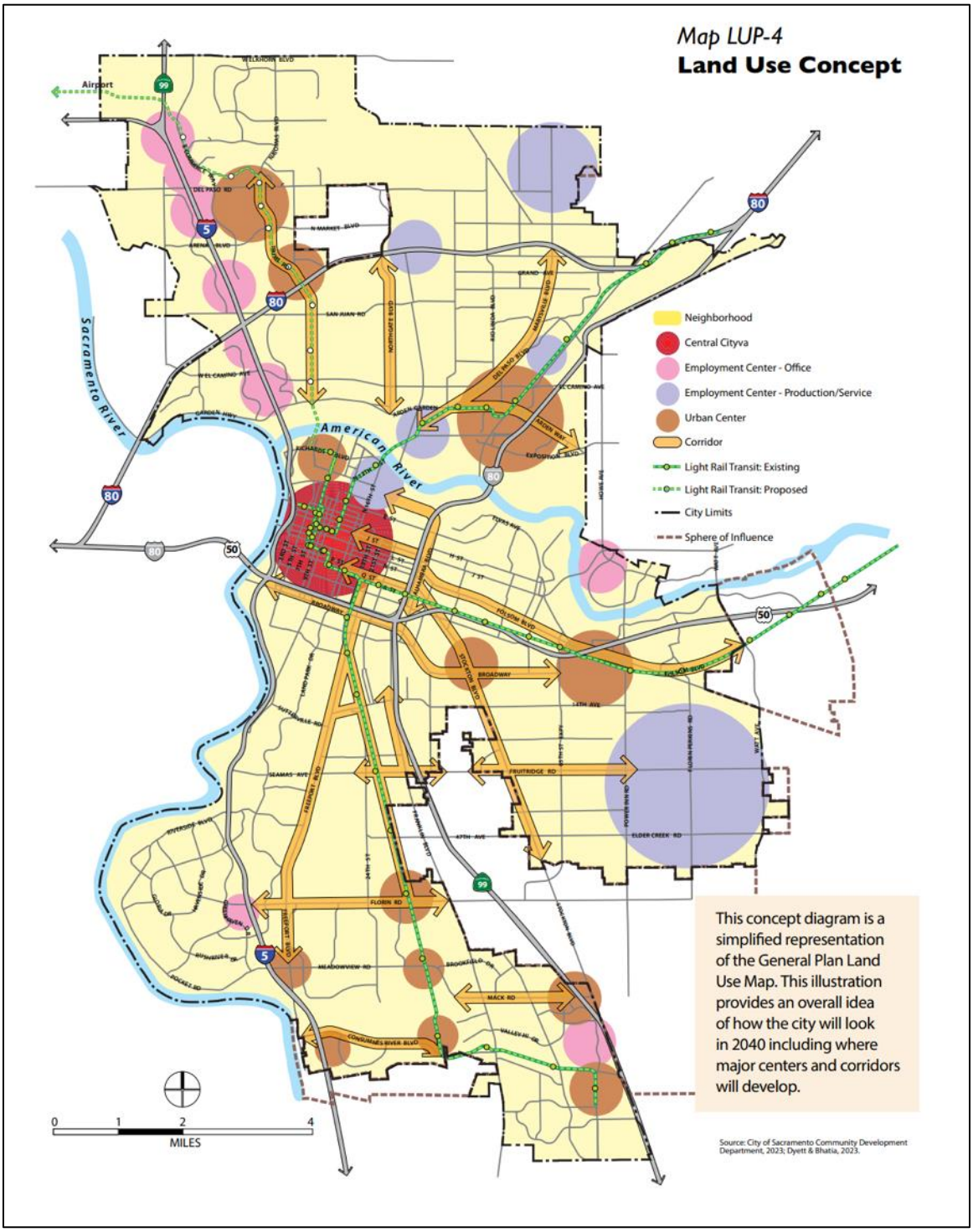


FIGURE 2-8: LAND USE CONCEPT MAP (2040 GENERAL PLAN)

Within each of these defined Opportunity Areas, a certain amount of growth and number of jobs are anticipated to be created. The 2023 Water Master Plan initially presented 59 of these Opportunity Areas, shown on

Table 2-6 and **Figure** 2-9 (West Yost, 2023); as previously mentioned, two additional developments within the City limits have been proposed since then. Non-Opportunity Areas include anticipated growth throughout the City. A summary of new and previously presented developments anticipated within the City limits is shown on **Table** 2-7.

TABLE 2-6: SUMMARY OF LAND USE PLANS IN SERVICE AREA WITH FUTURE RESIDENTIAL UNITS

Opportunity Area[38]	Residential Units	
	Anticipated Growth	Percent Growth
47th	44	0
65th North	2,612	4
65th South	1,670	2
Arco Arena	1,918	3
Arden Fair	749	1
Arden/Del Paso	371	1
Broadway	866	1
Broadway East	143	0
C Street	200	0
Central Business District	7,271	11
Central City Corridors	5,399	8
City College	128	0
Cosumnes River	471	1
CSU-Sacramento Village	237	0
Del Paso	258	0
Delta Shores	5,222	8
Delta Shores Transit Center	370	1
Florin	1,124	2
Folsom East	579	1
Franklin	77	0
Freeport North	72	0
Freeport South	515	1
Fruitridge	30	0
Globe Light Rail Transit (LRT)	361	1
Granite Park	531	1
Greenbriar	2,766	4
Jackson	1,155	2
Johnston East	155	0
Johnston West	56	0
Kaiser Medical Center	0	0
Lemon Hill	517	1
Mack	215	0

[38] Opportunity Areas are referenced from the 2023 Water Master Plan Update and while related, do not necessarily simulate Opportunity Areas as identified in the City's 2040 General Plan.

Opportunity Area, continued[39]	Residential Units	
	Anticipated Growth	Percent Growth
Marconi	78	0
Marysville	184	0
McClellan Heights/Parker Homes	287	0
Meadowview	518	1
Methodist Medical Center	80	0
North City Farms	34	0
North Natomas Employment Center	1,758	3
North Northgate	535	1
Northgate	83	0
Panhandle	1,622	2
Point West	0	0
Power Inn/Army Depot	351	1
R Street Central City Housing	1,530	2
Raley	0	0
Richards Boulevard	3,352	5
Riverfront	5,443	8
Robla	576	1
Royal Oaks	259	0
Southwest Natomas	442	1
Stockton	888	1
Stockton North	452	1
Stockton South	217	0
Strawberry Manor	544	1
Swanston Station	64	0
Truxel	534	1
UC Davis Medical Center	254	0
Union Pacific Railyards	6,767	10
Opportunity Area Growth	**62,935**	**92**
Non-Opportunity Area Growth	**5,470**	**8**
Total Growth	**68,405**	**100**

[39] Opportunity Areas are referenced from the 2023 Water Master Plan Update and while related, do not necessarily simulate Opportunity Areas as identified in the City's 2040 General Plan.

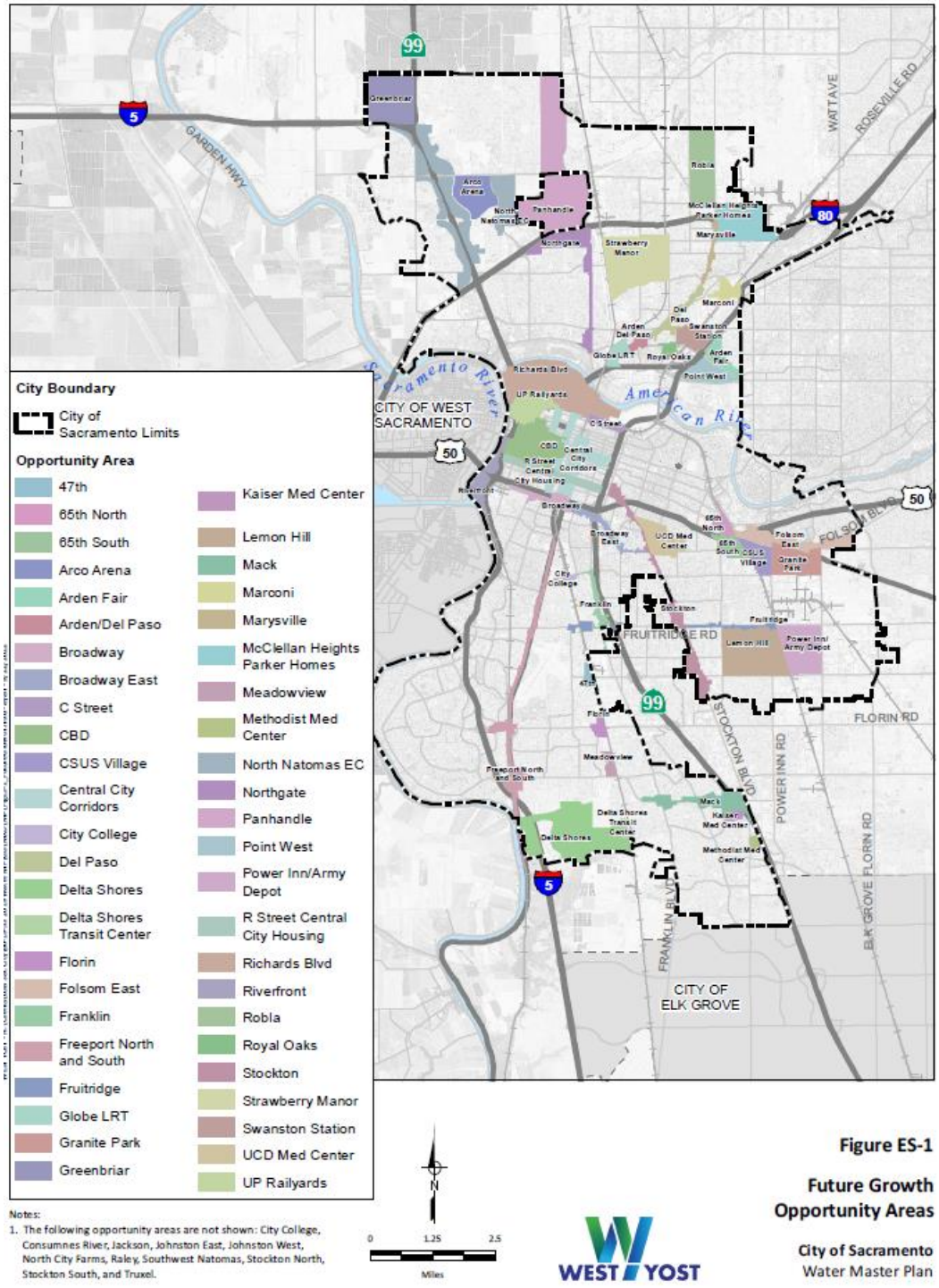


FIGURE 2-9: FUTURE GROWTH OPPORTUNITY AREAS FROM 2023 WATER MASTER PLAN (WEST YOST)[40]

[40] City of Sacramento, *Water Master Plan Update* (2023), Figure ES-1.

Two developments located within the City's Service Area, Stone Beetland and Aspen 1, were identified for inclusion since the preparation of the 2023 Water Master Plan Update. As shown on **Table** 2-7, Stone Beetland is the only development of the two planned to include future residential units, with the most recent planning documents indicating a combination of low, medium, and high-density residences totaling 1,163 new units. As of the preparation of this plan, correspondence with the City indicated that the Aspen 1 development is considered an industrial development, thus, will have no associated residential growth that could support an increase in population.

TABLE 2-7: SUMMARY OF OTHER LAND USE PLANS WITH FUTURE RESIDENTIAL UNITS

Opportunity Area[41]	Anticipated Growth (Residential Units)
Stone Beetland	1,163
Aspen 1	-
Known Opportunity Area Growth (Updated from Table 2-6)	**64,097**
Non-Opportunity Area Growth (from Table 2-6)	**5,470**
Total Growth	**69,567**

Other opportunity areas located outside of the City's existing service area were identified since the preparation of the 2023 Water Master Plan Update. Although growth associated with these anticipated developments may or may not play a part in the City's future growth and projected land use, applicable land use elements for these developments were considered in the preparation of this plan should the City need to serve areas beyond their current Sphere of Influence (SOI), presented in **Table** 2-8. Importantly, these areas must be annexed into the City before the City can formally provide retail water service and/or environmental compliance support.

[41] Opportunity Areas are referenced from the 2023 Water Master Plan Update and while related, do not necessarily simulate Opportunity Areas as identified in the City's 2040 General Plan.

TABLE 2-8: SUMMARY OF OTHER LAND USE PLANS OUTSIDE OF THE CITY'S SERVICE AREA

Opportunity Area[42]	Anticipated Growth (Residential Units)
Airport South	-
Upper Westside	5,840
Grandpark Southwest	7,739
Grandpark Trails	15,546
W. Jackson Highway	14,460
Sacramento International Airport	-
Metro Airpark Development	-
Other Opportunity Area Growth	**43,585**
Total Currently Identified Growth (Including Known Opportunity Areas)	**113,152**

2.3.4. Economic Trends & Other Social and Demographic Factors

The City of Sacramento has experienced sustained population and economic growth, with the broader metropolitan area expanding steadily as people relocate for more affordable housing and job opportunities. Historically anchored by public sector jobs – primarily state and local government employment – the region's economy is increasingly diversifying into private sectors, including healthcare, biotechnology, and technology. Numerous hospitals, such as Sutter Health, Kaiser Permanente, and UC Davis Health maintain major healthcare networks across the region. Biotechnology, exemplified by projects like Aggie Square, are anticipated to support thousands of research and development jobs and sustain economic output upon completion. Moreover, professional services and technology-related positions, boosted by a larger, more educated workforce and proximity to Bay Area talent, continue to expand. A major tailwind propelling recent economic expansion is the migration of professionals seeking a more affordable cost-of-living, compared to coastal cities. The presence of leading institutions of higher education, including California State University Sacramento and UC Davis, also contribute significant economic impact and job creation in the region.

Between 2019 and 2023, the City ranked #2 in economic growth among large US cities, fueled by a 32% increase in median earnings, 166% surge in business applications, and 31% population increase. These advances in economic growth and productivity follow sustained

[42] Opportunity Areas are referenced from the 2023 Water Master Plan Update and while related, do not necessarily simulate Opportunity Areas as identified in the City's 2040 General Plan.

declines in the unemployment rate. With unemployment rates in the Sacramento Metropolitan Area falling from a COVID-19 Pandemic high of 14.5% in April 2020 to 3.2% as recently as May 2022 (**Figure 2-10**). Despite diverse job creation, healthy unemployment, and a growing population, housing costs have continued to outpace wage growth, keeping affordability a central economic issue – especially for lower income residents.

A hallmark of the City remains its racial diversity, boasting one of the United States' highest diversity indexes. According to the 2020 US Census, the ethnic makeup of Sacramento is 37% White, 30% Hispanic/Latino, 20% Asian, 12% African American, and 1% other races or mixed race.

Sacramento's median household income is $91,387.[43] A diverse job market, high educational attainment, and relatively affordable housing have generally contributed to increases in household income over the last decade. Demographically, younger age generations and immigrant communities contribute to Sacramento's dynamic social fabric, while internal migration – such as transplants from high cost-of-living locales – continue to influence the City's composition and economic vibrancy.

[43] 2024 American Community Survey 1-Year Estimates (S1901). https://data.census.gov/profile/Sacramento_city,_California?g=160XX00US0664000

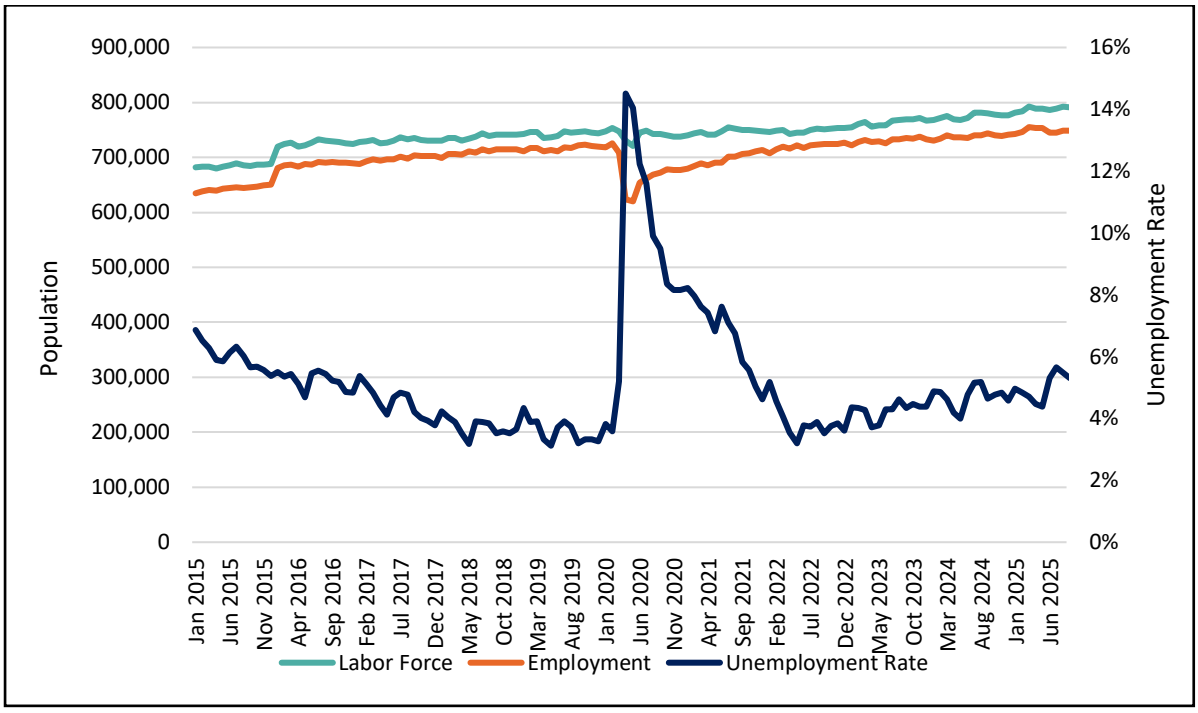


FIGURE 2-10: SACRAMENTO METROPOLITAN AREA EMPLOYMENT DATA[44]

2.4. Delivery System Details

The City's water distribution system supports a diverse customer base through an integrated network of surface water and groundwater supplies. As of December 2025, the system served almost 147,000 service connections utilizing two surface water treatment facilities, one pressure zone, multiple groundwater wells, storage tanks, pumping stations, and an extensive system of transmission and distribution pipelines.

Currently, the City has wholesale agreements to supply American River water to various entities described in Section 2.1 and Chapter 4 through seven turnouts located along the boundaries of the City's retail service area. The same treatment, storage, and transmission infrastructure used to serve retail customers also supports these wholesale deliveries.

[44] Sacramento County Metropolitan Statistical Area Labor Force Data, Employment Development Department, January 23, 2026, (March 2024 Benchmark). http://www.labormarketinfo.edd.ca.gov

2.4.1. Potable Water System

In late 2021, the City completed its water metering program such that all of the City's water customers are now metered.

To support future development and maintain reliable service, the City continues to evaluate and implement system improvements across its distribution network. Considerations in the northeastern portion of the service area include a new ground-level storage reservoir proposed near Richardson Village Park and the potential creation of a new pressure zone to improve operational efficiency and service reliability. Preliminary analysis indicates that while no immediate storage deficiency exists, available non-well storage capacity in the Northeast region is minimal, approximately 3.0 million gallons (MG) during summer peak conditions, and the area could warrant additional capacity and flexibility. A detailed storage and energy optimization study will assess potential benefits of localized storage versus transmission capacity enhancements, including opportunities to leverage capacity in the Southeast region.

Surface water supplies from the Sacramento River are treated at the City's Sacramento River Water Treatment Plant (SRWTP), and surface water supplies from the American River are treated at the City's E.A. Fairbairn Water Treatment Plant (EAFWTP) and the SRWTP.

Sacramento River Water Treatment Plant

The Sacramento River Water Treatment Plant, located just east of Interstate 5 and south of Richards Boulevard, treats water pumped from the Sacramento River approximately one-half mile downstream of the American River confluence. The facility began operation in 1924 with an initial treatment capacity of 32 mgd. Prior to construction of the current SRWTP, historical records indicate that water was diverted directly from the Sacramento River near the intersection of Front Street and I Street, where the first documented pumps were installed in the late 1800s to supply the City. Since 1924, the City has completed a series of expansions and modifications that increased the diversion and treatment capacity of SRWTP to 160 mgd. The original point of diversion, constructed in the 1920s, supported the City's early Sacramento River supply operations. In 2006, the City completed a new intake structure approximately 700 feet downstream of the original intake to improve reliability and operational flexibility. The Water+ project includes construction of a second Sacramento River water intake with pump station, and conveyance line, along with improvements to the existing intake and associated facilities.

The SRWTP is permitted to operate at 160 mgd between May 15 and September 30 of each year and 120 mgd for the remainder of the year. Although the permitted summer capacity is 160 mgd, summer operations can be impacted by low river flow levels that potentially reduce

the capacity of the plant to 135 mgd in the summer months. Therefore, existing supply capacity is evaluated at 135 mgd for drier years and 160 mgd for normal years.

The City is currently evaluating expansion of the SRWTP under the Water+ program to increase diversion and treatment capacity up to 310 mgd. Final EIR certification was approved by City Council on April 14, 2026 for Water+ which would include construction of a new intake structure downstream of the American and Sacramento River confluence to accommodate the expanded capacity. The City has selected a phased approach consisting of one 75 mgd expansion and two separate 37.5-MGD increases to achieve the additional 150 mgd of capacity.

E.A. Fairbairn Water Treatment Plant

The E.A. Fairbairn Water Treatment Plant is located along the south bank of the lower American River, approximately seven miles upstream of its confluence with the Sacramento River. The facility was completed in 1964 and has undergone a series of upgrades and improvements since its original construction. The plant was designed for phased expansion to an ultimate treatment capacity of 404 mgd. Currently, the EAFWTP has a diversion capacity of 200 mgd and a permitted treatment capacity of 160 mgd, consisting of 80 mgd from Basins 1 and 2 and 80 mgd from Basins 3 and 4.

At present, however, only 80 mgd of treatment capacity is considered reliable. Flocculation and sedimentation basins 1 and 2, which account for 80 mgd of permitted capacity, are in poor condition and are not in service, and filters 1 through 8 also require rehabilitation. The City has a planned project to demolish basins 1 and 2 and reconstruct eight filters and one basin to increase the plant capacity to 120 mgd. The 120 mgd capacity would be available in normal and wet years outside of Hodge flow restrictions.[45] In drier years and conditions, when American River flows drop below the Hodge flow criteria, the EAFWTP would be restricted to 100 mgd. Therefore, existing capacity is evaluated at 80 mgd, with an increase in capacity by 2030 of 100 mgd in drier (Hodge) years and 120 mgd in normal (non-Hodge) and wet years. Additional limitations on diversion rates are discussed in context with American River water rights in Chapter 3.

[45] Judge Richard A. Hodge issued a judgement known as the 'Hodge Decision" in 1990 as a result of litigation stemming from a dispute of potential diversions on the American River by East Bay Municipal Utility District (EBMUD). This “Physical Solution”, or legal criteria is based on flows in the lower American River and intends to resolve the conflict between flows reserved in the American River for instream resources and consumptive beneficial uses. The associated flow criteria implemented by the Hodge Decision are known as “Hodge Flows”.

Storage Tanks

The City operates seventeen storage facilities, consisting of twelve distribution system reservoirs located throughout the service area and five finished water clearwells located at the treatment plants, including two at the EAFWTP and three at the SRWTP. The total storage capacity of the twelve distribution reservoirs is approximately 49 million gallons (MG). The five clearwells at the treatment plants provide a combined storage capacity of approximately 45 MG.

The locations of the twelve distribution reservoirs and the two water treatment plants are shown on **Figure** 2-11.

Distribution and Transmission Pipelines

The City maintains approximately 1,800 miles of transmission and distribution pipelines ranging in diameter from 2 to 72 inches, as shown in **Figure** 2-11. Of this total, about 415 miles consist of pipelines 12 inches in diameter or larger, while roughly 70 percent of the system is comprised of six- and eight-inch diameter mains. In addition, the City collaborated with Sac Sewer and the SPA on the development of a dedicated recycled water pipeline that conveys recycled water from the EchoWater Resource Recovery Facility to the SPA Cogen Facility.

Pumping Facilities

The City currently operates eighteen high-lift service pumps at the SRWTP and EAFWTP and may install up to two additional high service pumps at the EAFWTP. Each distribution storage reservoir is equipped with a pump station to deliver water to customers as system demands fluctuate throughout the day. In addition, the City operates a separate booster pump station that serves a small area in the northeastern portion of the service area.

Pressure Zones

The City's distribution system operates with one pressure zone. The pressure zone is supplied directly by high service pumps at each of the water treatment plants and from the groundwater wells, while pressure is supported by the systems storage reservoirs. The City prefers to maintain a minimum pressure of 30 psi throughout the system.

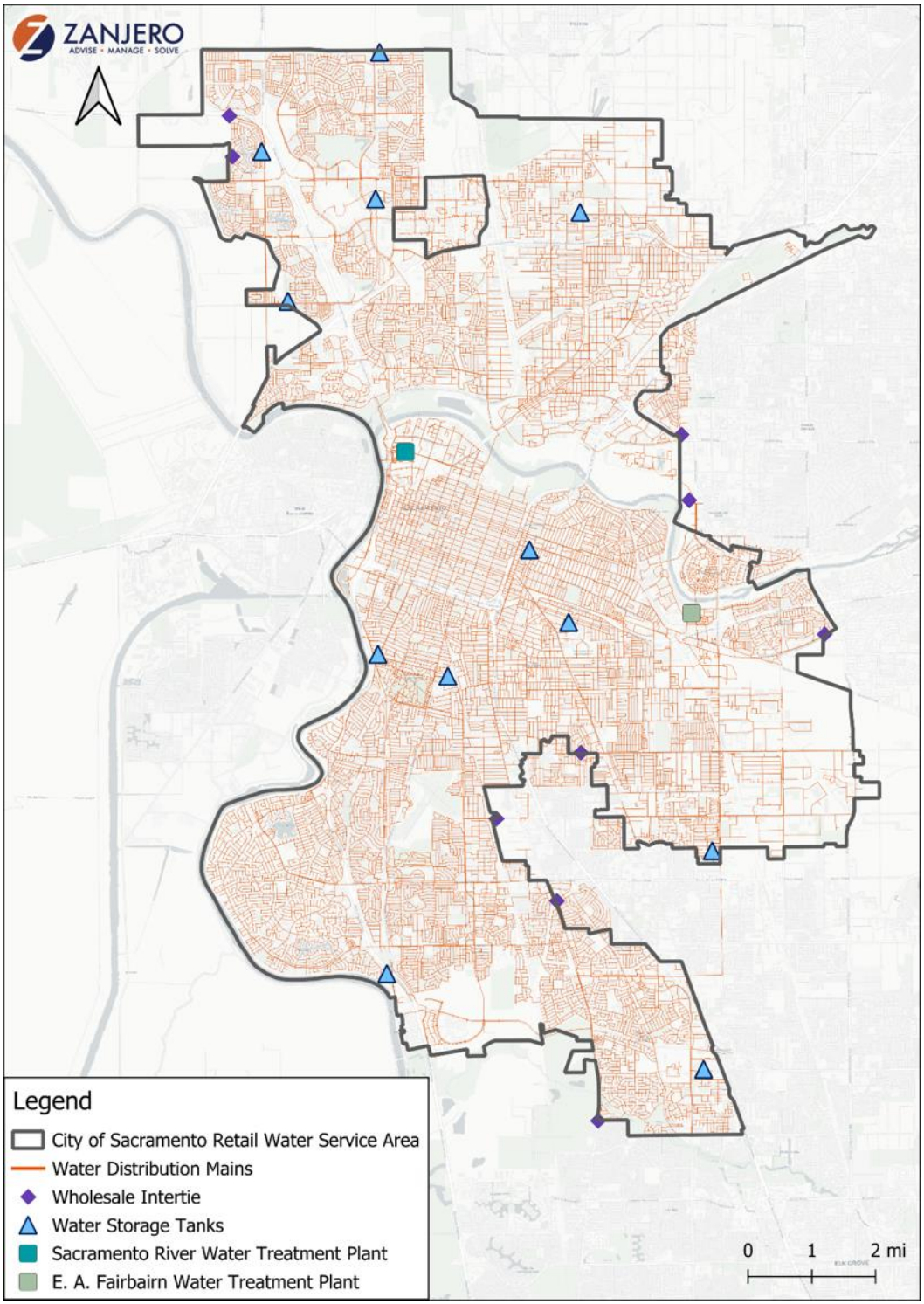


FIGURE 2-11: POTABLE WATER SYSTEM

2.4.2. Groundwater Supply System

In 2025, the City was operating 22 permitted potable supply wells that could produce about 20 to 22 mgd from deep, hydraulically connected alluvial aquifers underlying two subbasins of the Sacramento Valley Groundwater Basin. In addition to providing high quality water that requires only minimal treatment beyond disinfection, these wells help maintain system pressures in the northeast and southeast service areas and provide emergency supply that can reduce the need for additional storage tanks.

Since 2020, the City has advanced its Well Replacement Program, analyzed in the 2023 Draft Environmental Impact Report, to systematically replace aging wells, improve treatment reliability, and sustain long term production capacity. As shown on **Figure** 2-12, the program aims to modernize aging wells, in both the North American Subbasin and the South American Subbasin, further enhancing system reliability and potentially expanding operational capacity. The Groundwater Master Plan Well Replacement Program recommends continued rehabilitation or replacement of wells at the end of their useful life to maintain at least 22 mgd of reliable groundwater production.

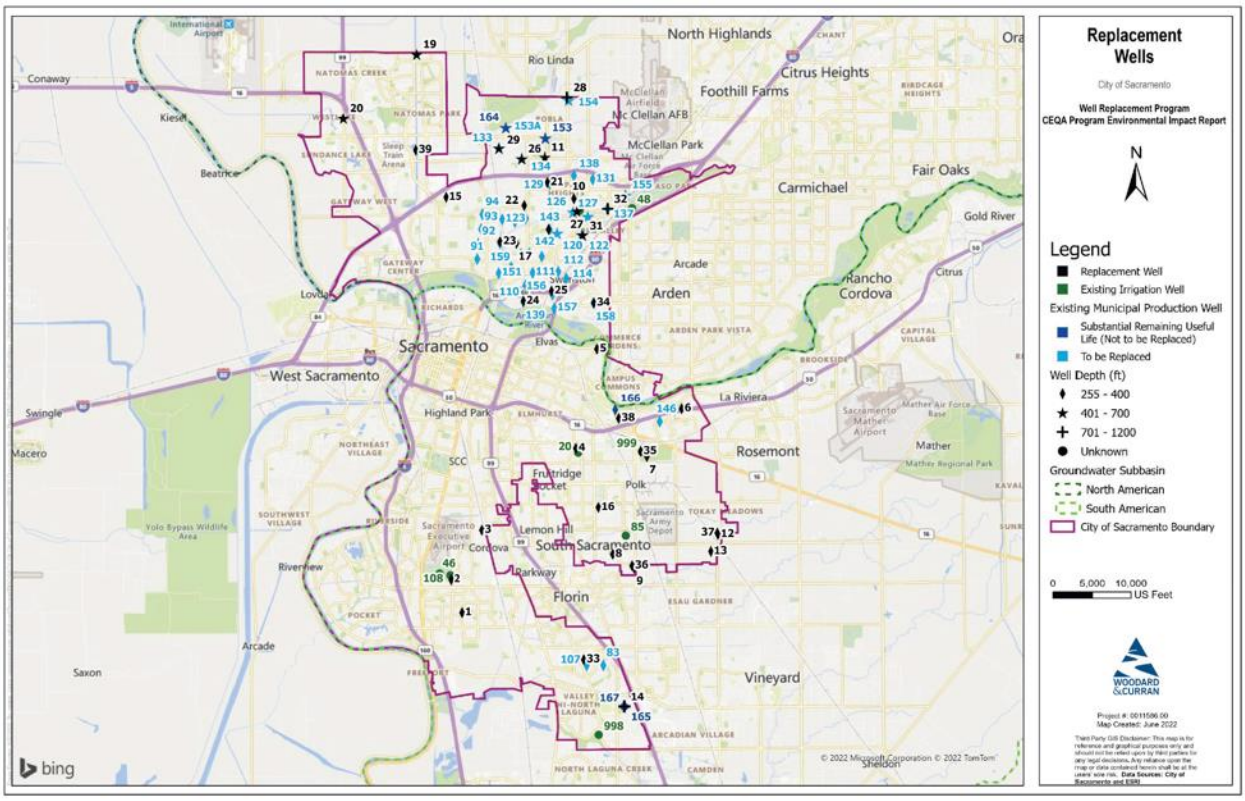


FIGURE 2-12: POTENTIAL REPLACEMENT WELL LOCATIONS(WOODARD CURREN)

The number of active, inactive, or out of service wells may change over time due to ongoing operations, rehabilitation, and construction activities. The City well inventory also includes irrigation and park supply wells that are within City limits but are not connected to the City's potable water system. Well locations, not including irrigation/park supply wells are shown on **Figure 2-13** on the following page, and groundwater supply is discussed in more detail in Chapter 3.

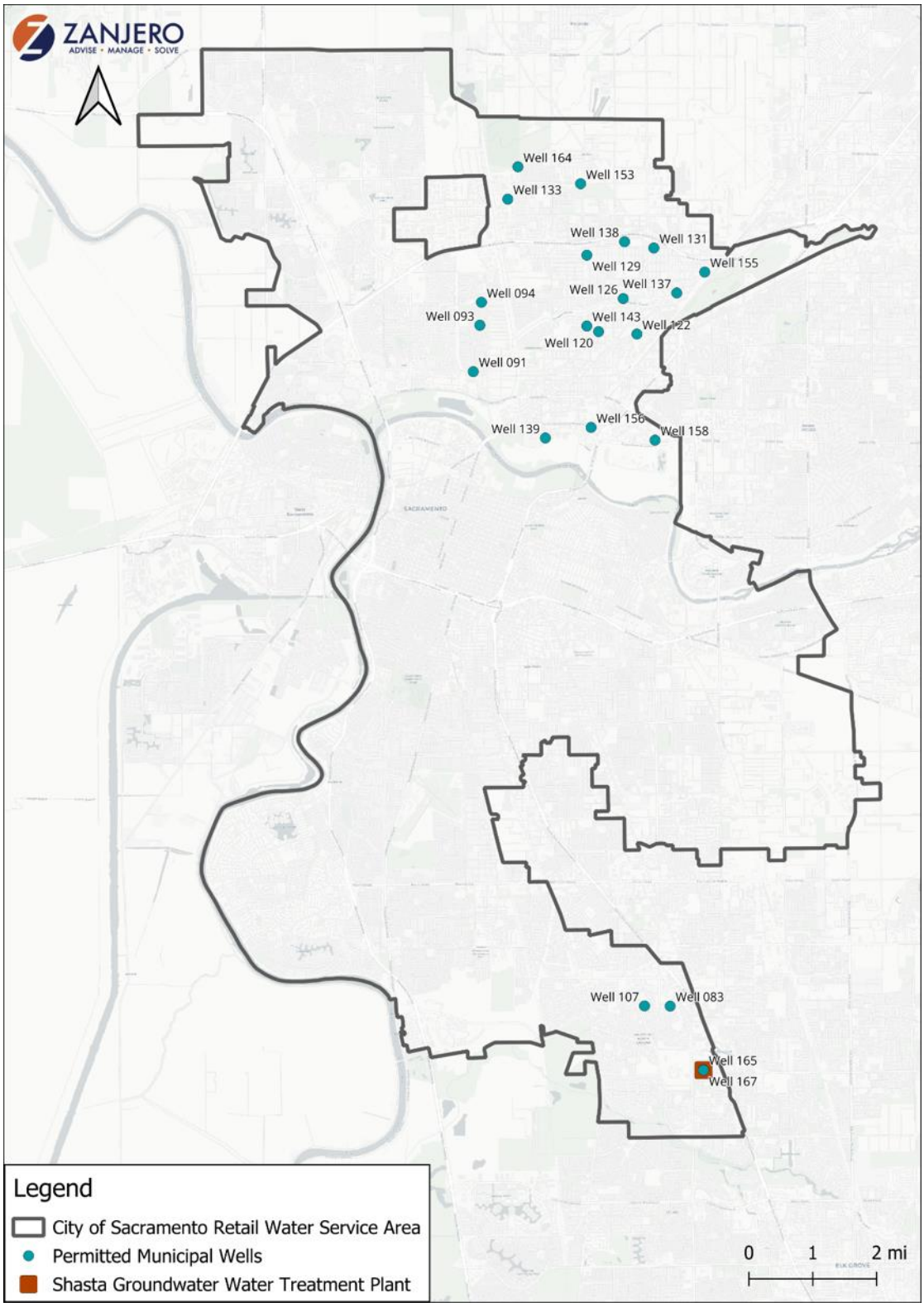

ZANJERO
ADVISE • MANAGE • SOLVE
Well 164
Well 153
Well 133
Well 138
Well 131
Well 129
Well 155
Well 126
Well 137
Well 094
Well 093
Well 143
Well 122
Well 120
Well 091
Well 139
Well 156
Well 158
Well 107
Well 083
Well 165
Well 167
Legend
City of Sacramento Retail Water Service Area
Permitted Municipal Wells
Shasta Groundwater Water Treatment Plant
0
1
2 mi

FIGURE 2-13: GROUNDWATER WELL MAP (AS OF DECEMBER 2025)

2.4.3. Non-Potable Water System

Recycled water is defined as treated municipal wastewater discharged from a wastewater treatment plant that is suitable for beneficial reuse. The City engages in regional collaboration with Sac Sewer, SCWA, and Sacramento Municipal Utility District (SMUD) to provide a small amount of recycled water to the SPA Cogen Facility, located outside of the City limits.

As an alternative to constructing their own cost-prohibitive recycled water system, the City partnered with SacSewer and SPA to construct a recycled water pipeline, currently delivering approximately 1 mgd of water from the EchoWater Facility to the SPA Cogen Facility. This wholesale recycled water is not distributed or additionally treated. This pipeline is sized to convey a maximum of 4.6 mgd to serve additional future users within the City with recycled water for landscaped irrigation, although this expansion may not occur until after the 2050 planning horizon. The existing volumes of recycled water conveyed to Cogen are presented in **Table** 3-20 in Chapter 3.

2.4.4. Wholesale Interconnections

As discussed previously in this Chapter, the City of Sacramento is a cornerstone of regional water supply management. In addition to its own retail service, the City provides wholesale water service to three neighboring agencies – SCWA, SSWD, and CalAm – as well as Natomas Unified School District. The City's water system is part of a complex and collaborative regional network designed to ensure a reliable and resilient water supply. This network relies on a series of City interconnections with neighboring water agencies to facilitate the transfer and exchange of surplus water supplies, a strategy that has proven particularly beneficial during droughts and for conjunctive management. Moreover, wholesale agreements underscore the City's role as not just a local provider, but as a regional provider capable of leveraging surplus water and delivery infrastructure to the benefit of its neighbors.

Sacramento County Water Agency – operates two interconnections with the City. One connection is located near Franklin Boulevard at the southern boundary of the City and the second is located in Bayou Road at the western edge of the City. These interconnections respectively serve the Zone 40 service area; and the Sacramento International Airport and Zone 50 Metro Air Park.

Sacramento Suburban Water District – receives a variable amount of wholesale water from the City for its South Service Area (located in the American River POU) since 2007. The City operates seven interties with SSWD. One intertie is used to convey the aforementioned water and is located near Howe Avenue and Northrop Drive, the remaining six interties are for emergency use only.

California American Water Company – CalAm uses a combination of groundwater and wholesale water purchases to supply water to three service areas. The City maintains five active interconnections serving Cal-Am as described in Section 2.2.3. Additionally, there are five emergency interties to Cal-Am Fruitridge Visa area, three emergency interties south of the Cal-Am Fruitridge Vista area, and one emergency intertie shared with the Sac Suburban Water District in the Arden Service Area.

Natomas Unified School District – a relatively small wholesale agreement to serve the Paso Verde K-8 School, located outside but adjacent to the City limits.

In essence, Sacramento's water supply is not a standalone system but a vital part of a broader, interconnected network that leverages shared infrastructure and collaborative agreements to ensure a resilient and reliable water future for the entire region.

2.4.5. New Infrastructure and Resiliency

Along with planned capital improvement projects and system maintenance and upgrades, the City is participating in reliability projects both local and in the greater Sacramento region.

Water+ Project

The City of Sacramento is moving forward with the Water+ project to improve the resiliency of the existing SRWTP and EAFWTP facilities, as well as increase water treatment capacity to meet future municipal and wholesale water demands while exercising and protecting the City's existing surface water rights. The project will be implemented in phases and includes improvements to both of the City's surface water treatment plants and related infrastructure.

The Sacramento River Water Treatment Plant will be expanded in phases to increase treatment capacity. Phase I will increase capacity by 75 MGD, and future phases to buildout will provide an additional 75 MGD increase for a total of 150 MGD over current treatment capacity. The expansion includes a new intake structure in the Sacramento River, conveyance pipelines, and supporting infrastructure improvements. The Fairbairn Water Treatment Plant will also receive treatment process improvements as part of the project.

All increased diversions associated with the Water+ project will operate under the City's existing water rights framework and the 1957 permanent water rights contract with the

Bureau of Reclamation, which includes total diversions of 326,800 AFY by 2030. The project is designed to comply with the Water Forum Agreement, American River flow requirements, and applicable regulatory standards.

The Water+ project EIR was certified by City Council on April 14, 2026. The phased implementation approach will allow the City to incrementally increase surface water treatment capacity and enhance supply reliability to meet the region's long-term water needs.

RiverArc

The City of Sacramento is participating in the RiverArc Project, a regional partnership with Placer County Water Agency (PCWA) and City of Roseville to enhance water supply reliability and support environmental objectives for the lower American River. The project will create flexible diversion providing a new diversion point on the Sacramento River, improving supply diversification and reducing pressure on the American River, which is designated as a Wild and Scenic River.

RiverArc will utilize an existing intake on the Sacramento River and convey water through a new raw water pipeline to a new regional water treatment plant. Treated water will be distributed to partner agencies through new and existing transmission pipelines. The project is designed to be implemented in phases, with initial construction planned for the 2030s.

The project addresses the region's heavy reliance on the American River watershed, which currently provides approximately 80% of surface water supplies despite the Sacramento River being significantly larger. By diversifying supply diversion points, RiverArc will provide operational flexibility during periods when American River diversions are restricted, support conjunctive use of surface and groundwater supplies, and preserve environmental flows in the lower American River.

RiverArc is a key component of the Water Forum Agreement and received a $5.1 million grant from the Wildlife Conservation Board in 2023 to advance environmental review and planning work. The project is currently in the environmental review process and is anticipated to provide increased water supply reliability and enhanced ecosystem protection for the Sacramento region.

Groundwater Master Plan Well Replacement Program

The City's Groundwater Master Plan Well Replacement Program involves replacing up to 38 municipal production wells that are at or near the end of their useful life over a 15-year implementation period. The program responds to aging infrastructure challenges, groundwater quality concerns, and the need to maintain reliable groundwater extraction capacity as climate change increases the frequency and intensity of dry years.

Many existing well locations are too small to accommodate same-site replacement, and water quality issues affect the viability of other current wells. The replacement program addresses these constraints by identifying new well sites throughout the City's service area, distributed across both the North American Subbasin and South American Subbasin.

The program supports conjunctive use water management, allowing the City to strategically utilize groundwater during surface water supply constraints while promoting long-term sustainability of both water sources. Wells requiring additional treatment for constituents such as manganese will include on-site treatment systems with filters, storage tanks, and aeration equipment.

The program underwent comprehensive environmental review through a Draft EIR completed in April 2023, with implementation planned to extend through 2040 to align with the City's water demand projections and ensure continued water supply reliability.

Sacramento Regional Water Bank

The City of Sacramento is a participant in the Sacramento Regional Water Bank, a water reliability and storage program that leverages the "reservoir under our feet" to offset the effects of climate change on the region's water system. This project is led by the Regional Water Authority, representing over two dozen water providers, including the City, in the development of this program.

The SRWB will enable the City and participating regional members to deposit and withdraw water during wet and during dry periods, holding twice the capacity of the Folsom Reservoir and offsetting the impact of climate change on the region's water system due to the loss of snowpack, hydrologic variability, and environmental and regulatory conditions.[46] The SRWB formalizes conjunctive use programs that have been banking water over the past three decades and documented in Sacramento Groundwater Authority's Water Accounting Framework. RWA updated this framework into a formalized Water Accounting System to transparently manage and monitor water banking activities within the North and South American Subbasins. The SRWB is discussed in more detail in Chapter 3.

Planned System Improvements

The capacity of the existing and planned infrastructure is a key consideration for the City's ability to support future retail and wholesale demands. The 2023 Water Master Plan provided a sensitivity analysis of the City's future water distribution system, including an evaluation of the water supply, storage, and pumping capacity needed to support future water demands

[46] Regional Water Authority, Sacramento Regional Water Bank, https://sacwaterbank.com/

while meeting various performance standards and operational criteria. Evaluation scenarios reflected:

- Existing, future, and alternative supply sources
- Additional growth within the City's service area
- Potential development areas outside of City limits that might be considered for City service in the future
- 2030, 2040, and 2050 planning horizons
- Future water deliveries to potential wholesale customers
- Progress on planned improvements and/or expansions and participation in reliability projects.

The results from the storage evaluation found that additional storage may be needed to sufficiently support future retail growth. Furthermore, additional storage supports sustainable treatment processes and can absorb concentrated water demands associated with the City's irrigation schedule. Additional storage also supports the ability to take tanks offline for required or preventative maintenance. Future system reliability projects could reduce the amount of emergency storage needed by improving overall system reliability. For example, participation in projects such as RiverArc is recommended to improve the City's water portfolio, along with continued investment in groundwater wells and the City's water treatment plants. The City's pumping system was found to have sufficient capacity to support projected retail and wholesale demands through 2040, but that new storage facilities would require new associated pumping facilities to meet projected demands through 2050.[47]

As part of the hydraulic evaluations, the 2023 Water Master Plan recommended that the City improve existing pipeline capacity and managing distribution system pressures by continuing and/or expanding their annual rehabilitation and replacement efforts for existing groundwater wells and pipelines, respectively. Additionally, the plan recommended installing several new transmission pipelines to facilitate future retail and wholesale deliveries and meet performance criteria within and beyond 2040. For more information, see Chapter 7 of the City's 2023 Water Master Plan Update.

Although an extensive technical and capacity analysis has not yet been completed for future retail and wholesale demands beyond the 2050 planning horizon, the City anticipates that

[47] 2023 Water Master Plan Update (West Yost). Section 7.7.3 - Pumping Capacity Evaluation, pp. 7-12 to 7-14.

future conjunctive use, water storage, and pumping improvement projects will sufficiently expand system capacity. When appropriate, an updated sensitivity analysis will be completed to evaluate what improvements are needed for existing and new infrastructure to supply water to meet long-term future demands. Long-range demands are discussed in Chapter 4.

2.5. Energy Intensity

California Water Code Section 10631.2(a) codified the requirement that urban suppliers must include information it can readily obtain related to the amount of energy consumed to divert, extract, produce, treat, and deliver water, referred to as "Energy Intensity Reporting" for urban water suppliers. *Energy Intensity* is defined as: the total amount of energy expended in kilowatt-hours (kWh) by the urban water supplier on a per acre-foot basis to convey water from the location where the urban water supplier acquires the water to its point of delivery (i.e., turnout).

Due to the manner in which water is supplied within the City's various service areas, it is not currently possible to parse out energy use for extraction, treatment, storage, and distribution. This limitation is due to the delivery and treatment facilities operating on shared power meters, and the use of solar at some of the City's facilities. As a result, the City employs a Total Utility Approach, which sums the annual net energy consumed for all water management processes, divided by total volume of water (in acre-feet).[48] These processes include diversion, conveyance, placement into storage, treatment, and distribution. The total energy intensity is reported in **Table** 2-9.

TABLE 2-9: ENERGY INTENSITY – TOTAL UTILITY APPROACH - 2025

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	82,845
Energy Consumed (kWh)	34,963,798
Energy Intensity (kWh/acre-foot)	422

[48] Net energy is used due to solar production not being tracked separate from consumption.

Chapter 3
Water Supply

The City of Sacramento operates one of the oldest public municipal water systems in California, currently serving water to a population of over 527,000 residents, with close to 147,000 customer service connections over a retail service area of about 101 square miles. The City is actively committed to regional environmental stewardship and public trust resources while continuing to build facilities and being actively involved in regional resiliency initiatives to provide safe and reliable water supplies to the public. Moreover, these key items buttress the City's Climate Adaptation and Watershed Resilience platform – the platform guiding the City's future water supply management.

The City's water supply portfolio draws from multiple watersheds and groundwater basins. Surface water entitlements include a Sacramento River pre-1914 right and post-1914 appropriative permits on both the Sacramento River and American River systems. The American River supply originates from two distinct watershed sources: the South Fork American River watershed, and the Middle Fork American River watershed. Both sources flow to City municipal diversion points through the United States Bureau of Reclamation's Folsom Reservoir and Lake Natoma on the Lower American River. The E.A. Fairbairn Water Treatment Plant is the City's diversion point on the American River.

About a mile downstream from the confluence of the American and Sacramento Rivers is the City's Sacramento River Water Treatment Plant intake structure. The City has six appropriative surface water rights with varying priority dates, diversion rates, and seasonal limitations. The pre-1914 appropriative right on the Sacramento River, dating to 1849, provides the most senior priority date with year-round diversion capability of 75 cubic feet per second. Permit 992, originally filed in 1920, allows an additional 225 cfs of Sacramento River diversion capacity. On the American River system, four permits (11358, 11359, 11360, and 11361) provide substantial volume but with some seasonal and regulatory limitations. The availability and operational characteristics of these surface water assets are shaped by contractual agreements and regulatory overlays including provisions in the 1957 Operating Contract with the United States Bureau of Reclamation (USBR)[49], and the City's voluntary Water Forum Agreement commitments, pending regional approval.

[49] USBR Operating Contract No. 14-06-200-6497

Both river systems are subject to regulatory actions, stored water operations, and operational decisions made at upstream facilities that are outside the City's direct control. Sacramento Municipal Utility District's (SMUD) Upper American River Project (UARP), Folsom Dam operations, USBR water releases, State Water Board curtailment orders, Bay-Delta Plan flow requirements, and other flow constraints can independently or collectively affect the availability of surface water supply from any given watershed in a given year.

The City's surface water supply system is complemented by strategically managed groundwater assets that enhance operational flexibility and drought resilience. Groundwater resources from the North American and South American subbasins provide the City with critical operational flexibility, particularly during dry-year conditions. The City leverages permitted wells as part of their conjunctive use strategy to provide additional supply when surface water diversions are faced with regulatory or hydrologic constraints. However, not all wells are active at all times, as they may be shut down for conjunctive use operation, or they may be limited by factors such as maintenance needs, water quality constraints, permitting requirements, or facility upgrades. The City's ongoing Well Replacement Program aims to replace the City's aging wells, further enhancing system reliability and operational capacity. The City's groundwater supplies and management are discussed in Section 3.3.

Chapter 3 provides detailed analysis of each component of Sacramento's water supply portfolio, describing the characteristics and management of each supply along with anticipated availability under normal, single dry year and multi-year drought conditions. Discussion is also provided about the anticipated supply availability through 2050 and beyond. For clarity, surface water assets are grouped by source river system—American River and Sacramento River. The chapter coordinates closely with the supply assessments and demand projections detailed in Chapter 4 to provide a thorough, integrated view of how Sacramento's diverse water assets can meet current and future needs amid changing conditions.

3.1. Water Supply Sources

The City of Sacramento's water supply reliability depends on a strategically diversified portfolio of surface water rights and groundwater assets that have been developed and refined over more than 150 years of municipal water management. Surface water rights form the foundation of the City's supply system, supported by groundwater resources that provide critical operational flexibility and drought resilience. The City anticipates continuing its water stewardship and water asset management into the next millennium. The following sections provide a detailed examination of each component of the City's water asset portfolio.

3.2. Surface Water

The City of Sacramento relies on two primary surface water sources: the Sacramento and American River watersheds. The Sacramento River drains more than 27,000 square miles, producing roughly 70% of California's total water supply,[50] and flows 384 miles from its headwaters near Mount Shasta to the San Francisco Bay. Major tributaries include the Pit, Feather, and American Rivers. Flow in the Sacramento River is heavily regulated by the federal Central Valley Project (CVP) and the California State Water Project (SWP), with Shasta and Oroville Dams controlling releases that directly affect the City's diversion reliability and water quality.

The American River watershed encompasses about 2,150 square miles and originates in the Sierra Nevada mountains before joining the Sacramento River near downtown Sacramento. The river's three main forks—North, Middle, and South—flow westward and converge in Folsom Lake, which is operated by the USBR as part of the CVP. Below Folsom Dam, the Lower American River, designated as a federal and state Wild and Scenic River, travels roughly 23 miles to its confluence with the Sacramento River. The watershed's network of reservoirs and hydroelectric facilities, operated by agencies such as the USBR, SMUD, Placer County Water Agency, and others, helps regulate flows that support the City's municipal water supply, provide hydropower, and sustain important habitat and recreational uses.

The place of use of the City's water rights is shown in Chapter 2 at **Figure** 2-1. The City's surface water asset characteristics are shown below in **Table** 3-1. It should be noted that the City manages its water rights diversions according to the terms of the USBR Operating Contract discussed in Section 3.2.1 and **Table** 3-2.

[50] US Army Corps of Engineers, 1978.

TABLE 3-1: CITY OF SACRAMENTO'S SURFACE WATER RIGHTS

Source	Water Asset	Face Value Annual Amount and Maximum Rate of Diversion	Season of Use
Sacramento River	Pre-1914	75 cfs	Year-round
	Permit 992	81,800 AF | 225 cfs	Year-round
American River	Permit 11358	271,740 AF | 500 cfs	Direct Diversion: 11/1 – 8/1
	Permit 11359	443,479 AF | 310 cfs	Direct Diversion: 11/1 – 8/1
			Re-diversion: 1/1 – 12/31
	Permit 11360	966,175 AF | 1,200 cfs	Direct Diversion: 11/1 – 8/1
			Re-diversion: 1/1 – 12/31
	Permit 11361	95,109 AF | 175 cfs	Direct Diversion: 11/1 – 8/1

AF = Acre-Feet; cfs = cubic feet per second

Camp Sacramento Water Rights

The City also holds two small water rights on Sayles Creek, a tributary of the South Fork American River, dedicated exclusively to supporting operations at Camp Sacramento in El Dorado National Forest. The first is a riparian right with a 1920 priority date (S025297), authorizing diversion from Sayles Creek into a 9,100-gallon off-stream storage tank for domestic use during the May through September season. The second is License 1070, a State Board-issued appropriative right, allowing diversion of up to 7,200 gallons per day (approximately 0.011 cfs) from June 15 to September 15. The water rights are geographically restricted to the 14-acre Camp Sacramento property and therefore are not a part of the City's UWMP. Nevertheless, the City will maintain continued beneficial use of these rights for their intended purposes and will fulfill ongoing State Board reporting requirements.

3.2.2. USBR Operating Contract

The 1957 USBR Operating Contract (Operating Contract) serves as a cornerstone agreement between the City of Sacramento and the United States Bureau of Reclamation.[51] The two parties entered into the Operating Contract to settle ongoing disputes regarding water rights permits and the construction and operation of Folsom and Nimbus Dams and Reservoirs as well as Shasta Dam and Reservoir. The Operating Contract establishes limits on the volume and rates of City diversions in exchange for USBR's commitment to operate its facilities to

[51] The full name of the Operating Contract No. 14-06-200-6497 is: "Operating Contract Relating to Folsom and Nimbus Dams and Their Related Works and to Diversions of Water by the City of Sacramento".

ensure the City has a permanent and reliable water supply derived from its surface water permits. Accordingly, the Operating Contract ensures delivery of the City's water supplies, recognizes the City's water rights permits, and provides for delivery from USBR storage operations. The City agreed to pay USBR annually for Folsom Reservoir storage capacity used to satisfy USBR's contractual obligations for delivery. Storage payments began at 8,000 AF of capacity in 1963 and escalated over time reaching 90,000 AF of storage capacity by 2030.

The Operating Contract obligates USBR to maintain sufficient flows in the rivers at all times to support diversions under the City's water rights. The contract provides for the USBR to, "…impound and store water in the reservoirs back of Folsom and Nimbus Dams…", and deliver up to 245,000 AFY from the American River and to operate Shasta Dam to ensure the City can divert its full entitlement of 81,800 AFY from Permit 992 from the Sacramento River.[52] Maximum combined diversion volumes are limited as shown in **Table** 3-2 below. The City may divert up to 81,800 AFY from the Sacramento River as long as total diversions between to two rivers do not exceed the values in the total combined column. Additionally, the Operating Contract limits diversions to 225 cfs from the Sacramento River under Permit 992, and 675 cfs combined between the four American River permits. The Operating Contract is a permanent agreement and provides the City with an exceptionally reliable and secure water supply in all year types.[53]

TABLE 3-2: USBR OPERATING CONTRACT DIVERSION SCHEDULE AND MAXIMUM CONTRACT DIVERSIONS[54]

Year	Sacramento River	American River	Total Combined
2015	81,800	189,000	252,000
2020	81,800	208,500	278,000
2025	81,800	228,000	304,000
2030	81,800	245,000	326,800
2035	81,800	245,000	326,800
2040	81,800	245,000	326,800
2045	81,800	245,000	326,800
2050	81,800	245,000	326,800

[52] Operating Contract, Article 9 at p. 6.

[53] The water rights and Operating Contract descriptions in this chapter are for informational purposes only and are not intended to modify, interpret, or affect City or USBR underlying rights or contractual obligations.

[54] USBR Operating Contract No. 14-06-200-6497, Diversion Schedule by City of Sacramento, Schedule "A" and Schedule "B" at pp. 54-55.

3.2.3. Sacramento River Surface Water Assets

The City holds a pre-1914 appropriative water right (S014834) authorizing year-round diversion from the Sacramento River for municipal and industrial purposes. With a priority date of 1849, this represents the City's most senior water right. The diversion point is currently at the Sacramento River Water Treatment Plant (SRWTP), though historical diversions occurred near the intersection of Front Street and I Street.

The City also holds a single post-1914 Sacramento River permit, Permit 992 (Application 1743), with a priority date of March 30, 1920. This permit authorizes a year-round direct diversion of 225 cfs from the Sacramento River. There are two authorized points of diversion for Permit 992. The diversion point for municipal use is at the SRWTP, though the original intake facility, constructed in the 1920s, still exists several hundred feet north of the SRWTP. The second POD for Permit 992 is the inlet at Pioneer Reservoir.

Pre-1914 Claim

The City's pre-1914 water right on the Sacramento River of 75 cubic feet per second (cfs) is a foundational component of the City's water supply portfolio. This water right derives from original water diversions beginning in 1849 when William P. Henry established a suction pump on the Sacramento River. The City's established the first publicly owned water supply system in the State of California in 1854, following citizen approval of a direct tax in 1853 to finance a public water supply system in response to the devastating fire of November 1852. The right carries a priority date from the initial diversion date and is currently diverted at the SRWTP to serve the growing population of the City of Sacramento.

Pre-1914 Future Availability and Long-Term Reliability

The City's pre-1914 water right is considered reliable in all but extreme dry-years and curtailment scenarios because of its senior priority date. **Table** 3-3 shows a long-term average availability along with projected reliability.

TABLE 3-3: PRE-1914 ESTIMATED AVAILABILITY FROM 2026-2030 (CFS)

Year Type		Supply Available
Normal		75
Single Dry-Year		75
Multi-Year Drought	2026	75
	2027	75
	2028	75
	2029	75
	2030	75

The State Board has issued curtailment orders for pre-1914 water rights in extreme drought conditions, most recently during 2021 and 2022. However, these curtailments have not included curtailment of Sacramento River diversions affecting the City of Sacramento's 1849 priority date.[55] **Table** 3-4 shows water availability projections based on this reliability, however, it should be noted that curtailments in extreme conditions could still occur.

TABLE 3-4: PRE-1914 WATER FROM 2030 – 2050 (CFS)

Year Type		2030	2035	2040	2045	2050
Normal		75	75	75	75	75
Single Dry-Year		75	75	75	75	75
Multi-Year Drought	Year 1	75	75	75	75	75
	Year 2	75	75	75	75	75
	Year 3	75	75	75	75	75
	Year 4	75	75	75	75	75
	Year 5	75	75	75	75	75

Sacramento River Permit 992

Permit 992 (Application 1743), with a priority date of March 30, 1920, authorizes direct diversion of 225 cubic feet per second (cfs) year-round from the Sacramento River. Permit 992 has a maximum total volume available of 81,800 acre-feet per year (AFY). The authorized points of diversion include the SRWTP and the inlet at Pioneer Reservoir. Water at Pioneer Reservoir is diverted to flush the wastewater reservoir, after which, the surface diversions are pumped to the Sacramento Area Sewer District's EchoWater Resource Recovery Facility (EchoWater Facility). At this time, Pioneer Reservoir is not part of the City's potable water system.

The City's current authorized POU for water diverted under the Sacramento River permit includes all the land within the City Limits, which expands over time as the City's boundary expands. As shown in **Table** 3-5, 2016 to 2025 diversion volumes have ranged from over 40,000 to under 1,000 acre-feet per year. The City actively manages diversions based on hydrological, regulatory, and environmental conditions.

[55] https://www.waterboards.ca.gov/drought/delta/#tableau

TABLE 3-5: PERMIT 992 MANAGED SUPPLY, 2016 - 2025[56] (ACRE-FEET PER YEAR)

Year	Amount
2016	41,255
2017	10,485
2018	18,355
2019	13,072
2020	16,467
2021	14,303
2022	678
2023	34,310
2024	28,806
2025	822

Permit 992 Future Supply Availability and Long-Term Reliability

The City's Sacramento River diversions under Permit 992 are subject to the terms and delivery obligations of the USBR Operating Contract. As such, full volume of Permit 992 water is expected to be available, even in multiple dry years, as shown in the Supply Available columns in **Table** 3-6 and **Table** 3-7.

For long-term risk planning purposes that consider climate change and projected hydrology, the City contemplates supply for normal, single-dry, and multi-year drought periods.[57] These reference years for supply availability cannot reflect actual management decisions and actions that will be based on the City's Climate Adaptation and Watershed Resiliency framework that proactively plans for water resources resilience and redundancy in the context of increasing climate variability and unplanned watershed deficiencies or outages.

[56] Note: SWRCB reporting transitioned from Calendar Year (Jan-Dec) to Water Year (Oct-Dec) in 2021

[57] The UWMP reliability assessment uses base year references to aid in quantification of supply availability. Base years are detailed in DWR Table 7-1 R in Appendix X.

TABLE 3-6: PERMIT 992 ESTIMATED FUTURE AVAILABILITY FROM 2026-2030 (ACRE-FEET PER YEAR)

Year Type		Supply Available
Normal		81,800
Single Dry-Year		81,800
Multi-Year Drought	2026	81,800
	2027	81,800
	2028	81,800
	2029	81,800
	2030	81,800

TABLE 3-7: PERMIT 992 ESTIMATED FUTURE AVAILABILITY – 2050 PLANNING HORIZON (ACRE-FEET PER YEAR)

Year Type		2030	2035	2040	2045	2050
Normal		81,800	81,800	81,800	81,800	81,800
Single Dry-Year		81,800	81,800	81,800	81,800	81,800
Multi-Year Drought	Year 1	81,800	81,800	81,800	81,800	81,800
	Year 2	81,800	81,800	81,800	81,800	81,800
	Year 3	81,800	81,800	81,800	81,800	81,800
	Year 4	81,800	81,800	81,800	81,800	81,800
	Year 5	81,800	81,800	81,800	81,800	81,800

3.2.4. American River Surface Water Assets

The City holds four State-issued water right permits authorizing diversions of American River water, representing a foundational component of Sacramento's municipal water supply, regional water supply reliability, climate resiliency, and public trust benefits.

American River Permits 11358 and 11361

The City of Sacramento holds Permit 11358 (Application 12140, priority date October 29, 1947) and Permit 11361 (Application 16060, priority date September 22, 1954) on the American River. Together, these permits authorize direct diversion at a combined maximum rate of 675 cfs, with Permit 11358 authorizing up to 500 cfs and Permit 11361 authorizing up to 175 cfs. The face value of these entitlements, as authorized by the State Water Resources Control Board (SWRCB), totals approximately 366,848 acre-feet per year. Both permits provide for direct diversion from November 1 through August 1, with no diversions allowed during August,

September, and October, as established by the 1958 State Water Rights Board Decision-893 (D-893).

The primary point of diversion for both permits is at the E.A. Fairbairn Water Treatment Plant. The permits are designated for municipal purposes, including domestic, industrial, and recreational uses, within the City of Sacramento and adjacent areas covering approximately 79,500 acres, as shown in **Figure** 3-1 below. Diversions under these permits are subject to several overlying conditions, including the City's Water Forum Agreement's flow and volume restrictions at the American River diversion point based on the Hodge Decision flow criteria for the Lower American River. Diversions are also limited by the USBR Operating Contract described in Section 3.2.1.

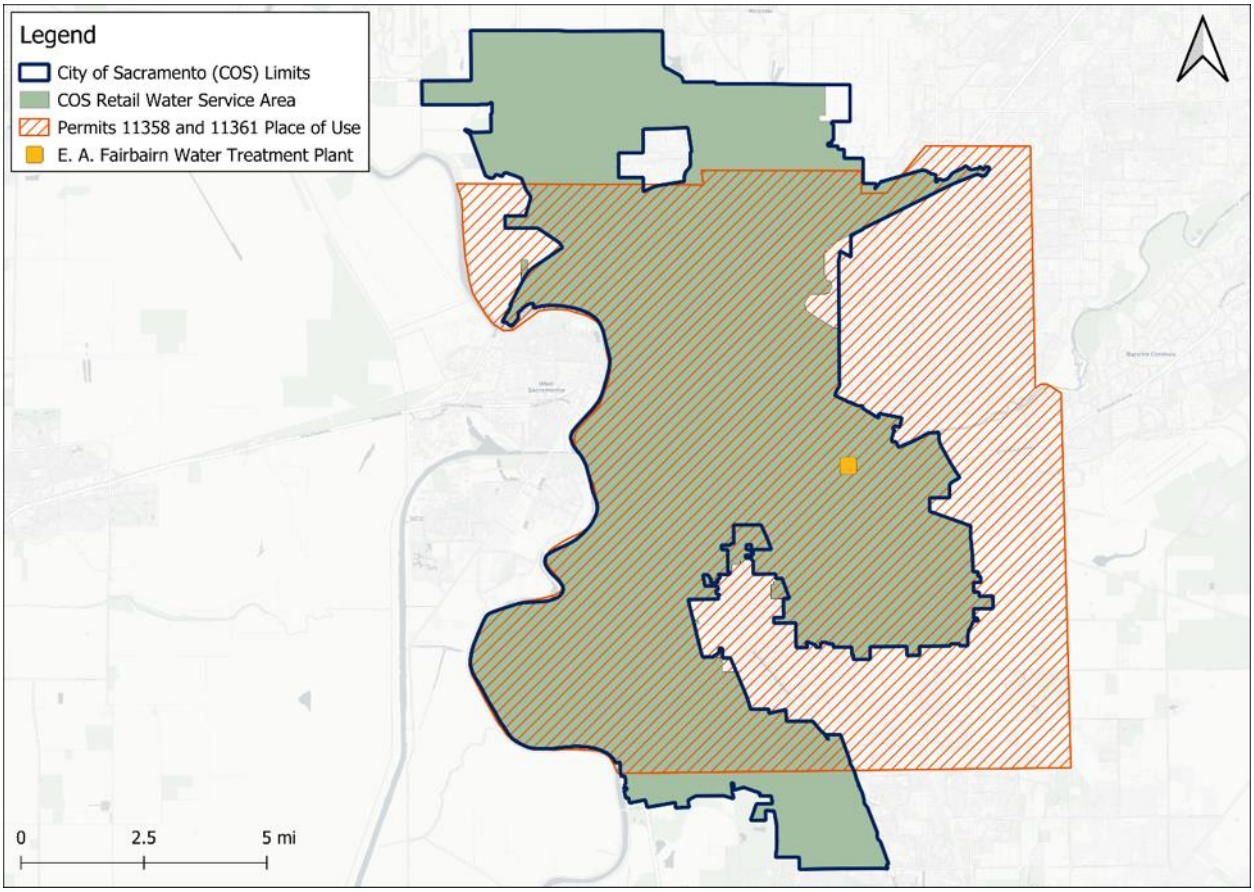
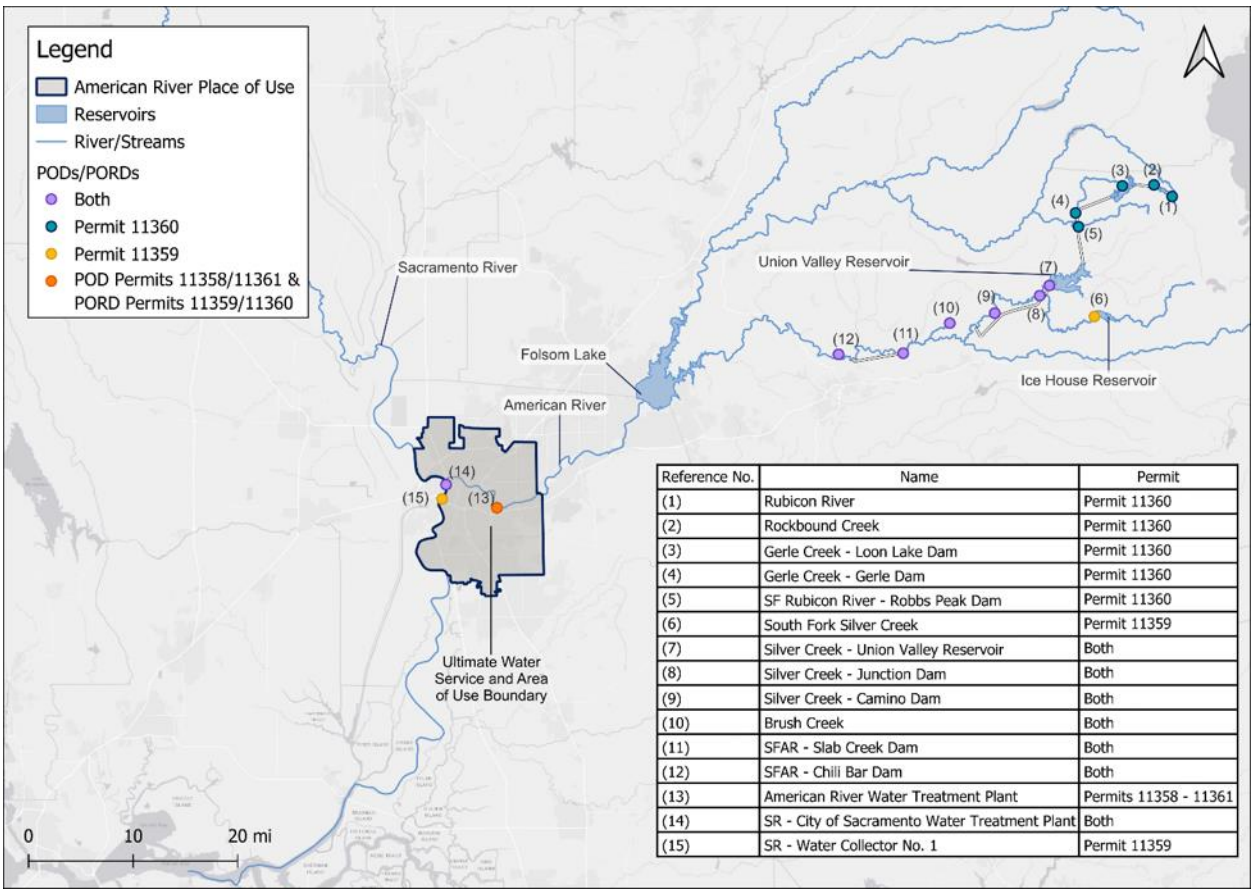


FIGURE 3-1: PLACE OF USE FOR PERMITS 11358 AND 11361 WITH PRIMARY POINT OF DIVERSION

American River Permits 11359 and 11360

Permits 11359 (Application 12321, priority date February 13, 1948) and 11360 (Application 12622, priority date July 29, 1948) were assigned to the City by the Sacramento Municipal Utility District in 1957 and issued in 1958. Permit 11359 authorizes direct diversion of 310 cfs and

275,000 AF of diversion to storage, with a maximum total volume available of 443,478.5 AFY. Permit 11360 authorizes 1,200 cfs direct diversion and 314,000 AF of diversion to storage, with a maximum total volume available of 966,174.8 AFY. Both permits allow direct diversion and diversion to storage from November 1 to August 1st. The City can divert water under both rights at EAFWTP and SRWTP. Moreover, because of the re-diversion from storage term, these permits allow for water supply to be rediverted at the City's water treatment plants in August, September and October. The place of use for both permits covers 96,000 acres of area that encompasses, but is not coterminous with, the city limit boundary. SWRCB maps reference this as the "ultimate water service and area of use boundary." **Figure** 3-2 shows the points of diversion and re-diversion as well as the place of use for Permits 11359 and 11360.



Reference No.	Name	Permit
(1)	Rubicon River	Permit 11360
(2)	Rockbound Creek	Permit 11360
(3)	Gerle Creek - Loon Lake Dam	Permit 11360
(4)	Gerle Creek - Gerle Dam	Permit 11360
(5)	SF Rubicon River - Robbs Peak Dam	Permit 11360
(6)	South Fork Silver Creek	Permit 11359
(7)	Silver Creek - Union Valley Reservoir	Both
(8)	Silver Creek - Junction Dam	Both
(9)	Silver Creek - Camino Dam	Both
(10)	Brush Creek	Both
(11)	SFAR - Slab Creek Dam	Both
(12)	SFAR - Chili Bar Dam	Both
(13)	American River Water Treatment Plant	Permits 11358 - 11361
(14)	SR - City of Sacramento Water Treatment Plant	Both
(15)	SR - Water Collector No. 1	Permit 11359

FIGURE 3-2: POINTS OF DIVERSION AND RE-DIVERSION

Unlike Permits 11358 and 11361, these permits authorize year-round re-diversion of previously stored water in connection with SMUD's Upper American River Project, providing significant operational flexibility. Re-diversion points include the City's water treatment plants on both the American River and Sacramento River. These permits are subject to the same overlying conditions as 11358 and 11361, including Water Forum Agreement restrictions at the American

River diversion point, and limitations imposed by the USBR Operating Contract. But the year-round re-diversion capability from storage provides operational advantages during dry periods and times of regulatory constraint.

TABLE 3-8: AMERICAN RIVER PERMITS SUPPLY, 2016 - 2025 (ACRE-FEET PER YEAR)

Year	Amount
2016	28,550
2017	34,634
2018	22,204
2019	33,924
2020	23,893
2021	31,714
2022	61,038
2023	37,544
2024	32,600
2025	65,617

American River Future Supply Availability and Long-Term Reliability

As discussed previously, the Operating Contract between the City and USBR obligates USBR to maintain sufficient flows in the American River to support agreed-upon diversions under the City's water rights. The contract provides for the USBR to deliver up to 245,000 AFY from the American River as set forth in Article 9 and Schedule B as long as the total combined diversion from both the Sacramento and American Rivers does not exceed the maximum combined diversion set forth in Schedule A. Though water available for diversion at the EAFWTP on the American River is subject to voluntary restrictions described in Section 3.2.6, the City may divert American River permit water at the SRWTP during periods when flows on the American River do not meet minimum flow rates. As such, the future availability for the City's American River permits is considered reliable in all year types and through the planning horizon as shown in **Table** 3-9 and **Table** 3-10.

TABLE 3-9: AMERICAN RIVER ESTIMATED FUTURE AVAILABILITY FROM 2026-2030 (ACRE-FEET PER YEAR)

Year Type		Supply Available
Normal		228,000
Single Dry-Year		228,000
Multi-Year Drought	2026	231,500
	2027	235,000
	2028	238,500
	2029	242,000
	2030	245,000

TABLE 3-10: AMERICAN RIVER WATER AVAILABILITY – 2050 PLANNING HORIZON

Year Type		2030	2035	2040	2045	2050
Normal		245,000	245,000	245,000	245,000	245,000
Single Dry-Year		245,000	245,000	245,000	245,000	245,000
Multi-Year Drought	Year 1	245,000	245,000	245,000	245,000	245,000
	Year 2	245,000	245,000	245,000	245,000	245,000
	Year 3	245,000	245,000	245,000	245,000	245,000
	Year 4	245,000	245,000	245,000	245,000	245,000
	Year 5	245,000	245,000	245,000	245,000	245,000

3.2.5. Curtailments Under the 2021–2023 Drought Emergency Regulation

This section provides information on State Water Resources Control Board (SWRCB) regulatory actions during a recent drought emergency. This narrative is for informational purposes and does not contemplate the USBR Operating Contract obligations to make water available under terms described in Section 3.2.1.

Between August 20, 2021, and April 3, 2023, the SWRCB implemented emergency drought regulations for the Sacramento–San Joaquin Delta watershed. These measures authorized curtailments of water rights when hydrologic conditions indicated insufficient supply to serve all demands. For the City, impacts varied by right and season, with interruptions concentrated in mid-summer 2022. **Figure** 3-3 summarizes the Sacramento River rights, and **Figure** 3-4 summarizes the American River rights during this period.

As the City's most senior right, the pre-1914 claim was not curtailed at any time during the Delta emergency-regulation period. Diversions remained available through the initial August 2021 actions and throughout 2022–2023, consistent with the strong reliability afforded by senior priority. Availability continued uninterrupted until the Delta curtailment orders were rescinded on April 3, 2023.

When the SWRCB enacted its emergency regulation on August 20, 2021, Permit 992 was included in the basin-wide curtailment but was restored the following month. In 2022, the right experienced a short suspension from July 6 through August 2, after which diversions resumed and remained available through the rest of 2022 and into 2023.

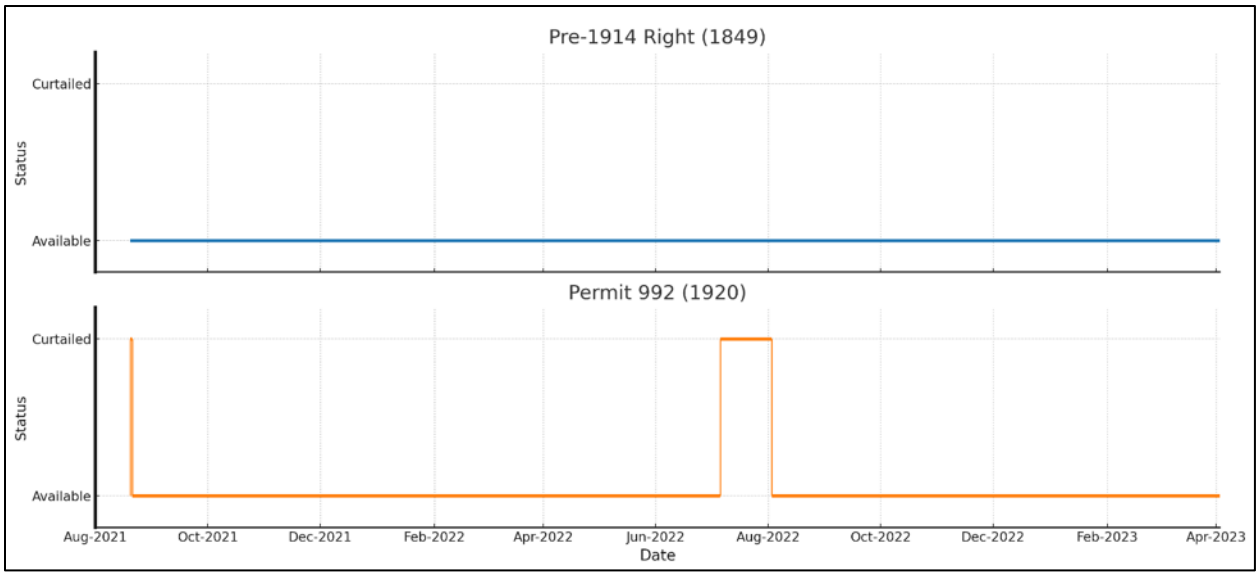


FIGURE 3-3: HISTORY OF CURTAILMENT FOR THE SACRAMENTO RIVER WATER RIGHTS, SACRAMENTO–SAN JOAQUIN DELTA DROUGHT EMERGENCY (AUG 20, 2021–APR 3, 2023)

Figure 3-3 above shows the timing and duration of curtailments for direct diversion of the City's Sacramento River rights under the Sacramento–San Joaquin Delta drought emergency regulation. The senior Pre-1914 claim (blue) remained available throughout this period with no curtailments, while Permit 992 (orange) saw two brief suspensions, August 20, 2021, and July 6–August 2, 2022.

On the American River, Permit 11358 was first curtailed with the August 20, 2021 Delta actions and then restored in September 2021. In 2022, access was suspended during peak summer stress from July 6–August 30, with a single-day checkpoint curtailment on October 18, 2022. Diversions resumed after each event and remained available until Delta curtailment orders were rescinded on April 3, 2023.

Permit 11361 was also initially curtailed on August 20, 2021, and reinstated the following month. In 2022, it experienced the longest summer suspension among the American River permits—from July 6–September 13—plus a one-day checkpoint curtailment on October 18, 2022. Diversions were available thereafter through rescission on April 3, 2023.

Curtailment began for Permit 11359 with the Delta emergency implementation and persisted through early fall 2021 (August 20–October 13). The permit was restored in mid-October and remained available until renewed drought conditions prompted a summer 2022 suspension (July 6–August 30), followed by a single-day checkpoint curtailment on October 18, 2022. Access resumed promptly after each event and continued until the statewide Delta curtailment orders were rescinded on April 3, 2023.

Similar to Permit 11359, Permit 11360 was curtailed from the initial Delta action through October 13, 2021, then restored. It experienced a repeat suspension during the 2022 summer low-flow period (July 6–August 30) and a one-day curtailment on October 18, 2022. Diversions were available thereafter and continued without further interruption until the Delta curtailment orders were rescinded on April 3, 2023.

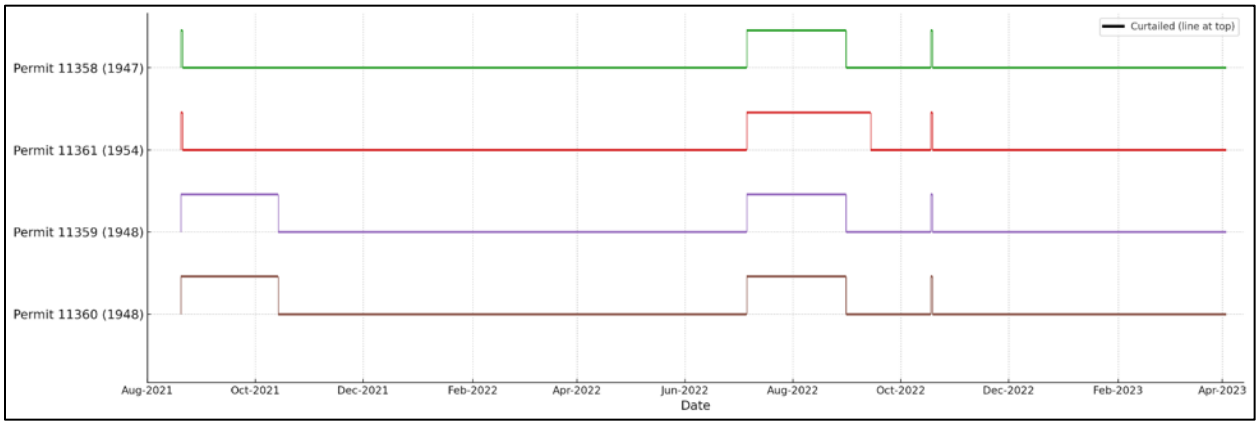


FIGURE 3-4: RECENT HISTORY OF CURTAILMENT FOR THE AMERICAN RIVER WATER RIGHTS, SACRAMENTO–SAN JOAQUIN DELTA DROUGHT EMERGENCY (AUG 20, 2021–APR 3, 2023)

As shown in **Figure** 3-4 above, Permits 11358 (green) and 11361 (red) show brief 2021 curtailments and longer mid-summer 2022 suspensions (with 11361 extending to September 13), while Permits 11359 (purple) and 11360 (brown) show the longest overall restrictions—an extended 2021 curtailment (August 20–October 13), a July–August 2022 suspension, and a brief October 18, 2022 event.

The difference in utility of Permits 11358 and 11361 that are not stored in the American River as compared to Permits 11359 and 11360 that are stored in reservoirs in the American River was incredibly important during the curtailment orders. Water under Permits 11358 and 11361 were

unavailable for delivery but water stored under Permits 11359 and 11360 could be delivered because they had been properly stored under the terms of the water rights. This important distinction is a foundational component of the City's Climate Adaptation and Watershed Resiliency program. It should also be noted that Incongruities may exist between curtailment orders and water availability assurances provided by the Operating Contract.

3.2.6. Hodge Decision

The Hodge Decision, issued in 1990, established minimum flow requirements in the Lower American River. These flow requirements vary seasonally: 2,000 cfs from October through February, 3,000 cfs from March through June, and 1,750 cfs from July through mid-October, as shown in **Table** 3-11 below. Although these flow requirements were specifically established for East Bay Municipal Utility District's American River diversions in the underlying litigation, Sacramento voluntarily incorporated them into its own American River permits for diversions at EAFWTP. These restrictions do not limit diversions at SRWTP under the City's American River permits after the American River joins the Sacramento River.

TABLE 3-11: HODGE FLOW CRITERIA IN THE AMERICAN RIVER

Period	Minimum Flow Requirement (cfs)
October 15 through February	2,000
March through June	3,000
July through October 15	1,750

Hodge conditions apply during extremely dry years, referred to as Conference Years, as well as during non-Conference Years when natural flows in the American River fall below the Hodge Flow Criteria. When natural flows fall below Hodge Criteria, the City has agreed to substantially reduce American River diversions, to as little as 100 cfs during October-December compared to the full 310 cfs available when natural flows are high. These voluntary restrictions apply to all four American River permits collectively as described in Section 3.2.6.

3.2.7. Water Forum Agreement Voluntary Restrictions

The City helped create and adopt the first Water Forum Agreement in January 2000 and the Water Forum 2050 effort that was completed in 2026. The City worked on these projects in partnership with regional water managers, local governments, business and agricultural leaders, and citizen and environmental caucuses. The Water Forum is an acclaimed water

management framework that balances regional water supplies for human uses with environmental objectives.

The City's Purveyor Specific Agreement (PSA) specifies the City's Water Forum commitments. Specifically, the PSA restricts EAFWTP diversions based on Folsom inflow projections and Hodge Criteria. During dry years, when projected unimpaired inflow to Folsom is 550,000 AFY or less, the City limits EAFWTP diversions to 155 cfs and 50,000 AFY, with graduated restrictions when Hodge Criteria are not met during other periods. Like the Hodge Decision, these limitations do not restrict diversions at SRWTP. **Table** 3-12 below summarizes the graduated restrictions under the Water Forum Agreement.

TABLE 3-12: GRADUATED RESTRICTIONS ON EAFWTP DIVERSIONS UNDER THE WATER FORUM

Hydrologic Condition	Time Period	Maximum Diversion Rate	Maximum Annual Volume
Dry Year Restrictions Conditions *March-Nov unimpaired inflow to Folsom <400,000 AF* *or,* *Annual projected unimpaired inflow <550,000 AF*	Year-round	155 cfs	50,000 AFY
Hodge Criteria Restrictions *Flows below required minimums*	January – May	120 cfs	No specific annual limit
	June – August	155 cfs	
	September	120 cfs	
	October – December	100 cfs	
Flows Above Hodge Criteria *Oct-Feb: ≥ 2,000 cfs* Mar-Jun: ≥ *3,000 cfs* *Jul-Oct: ≥ 1,750 cfs*	Year-round	310 cfs (200 MGD)	No specific annual limit

The Water Forum Agreement shapes Sacramento's American River water rights through voluntarily negotiated limitations that balance municipal supply with environmental protection. Most critically, the agreement institutionalizes Hodge Criteria by restricting EAFWTP diversions to specific volumes based on whether these flow thresholds are met. During the driest years, when projected unimpaired inflow to Folsom is 550,000 AFY or less, even stricter limitations apply, capping EAFWTP diversions at 155 cfs and 50,000 AFY regardless of demand. The City took these commitments to the State Water Resources Control Board and imbedded them in their American River water rights as a firm commitment to environmental flows.

These constraints apply collectively to all four American River permits, creating a unified operational framework for their management.

The Water Forum Successor effort (Water Forum 2050) also provides long-term environmental benefits to the Lower American River through the key diversion restrictions noted in **Table** 3-12. City Council approved the Water Forum 2050 Agreement on March 17, 2026.[58] The City's continued leadership and support for the next phase in the form of Water Forum 2050 encourages diverse regional stakeholders to support the City's and regional water development needs while simultaneously protecting species, habitats, and public trust resources. The Water Forum and its coequal objectives of a reliable and safe water supply for the region's economic health and development, balanced with the Lower American River's fishery, wildlife, and recreational values, is a fundamental underpinning of the City's Climate Adaptation and Watershed Resilience program.

3.3. Groundwater

The UWMP requires urban water suppliers to include specific details about groundwater in their UWMPs, such as the current and planned sources, groundwater management plans, basin descriptions, and past and projected pumping amounts.[59] This section provides a comprehensive understanding of groundwater use and sustainability within the City's service area.

Groundwater remains a critical and reliable component of the City of Sacramento's diversified water supply portfolio. The City of Sacramento maintains substantial groundwater assets across two major subbasins that complement its extensive surface water rights portfolio. The City relies on groundwater primarily as a conjunctive-use resource to supplement surface water supplies from the Sacramento and American Rivers, particularly during dry-year and curtailment conditions when surface water availability may be constrained. The City's approach to groundwater management emphasizes operational flexibility, supply reliability, and long-term sustainability in coordination with regional groundwater agencies and neighboring purveyors.

As an example, under the ARTESIAN (American River Terms for Ecosystem Support and Infrastructure Assistance Needs) agreements, the City of Sacramento participates in a regional conjunctive use strategy designed to improve water supply reliability during dry and critically dry years. In designated "call years," the City reduces its surface water diversions from the American and Sacramento Rivers and instead relies more on groundwater, either

[58] https://waterforum.org/uncategorized/city-of-sacramento-approves-water-forum-2050-agreement/
[59] California Water Code Section 10631(b)(4)

from its own facilities or through coordinated exchanges with regional partners. This temporary shift allows equivalent volumes of surface water to remain instream to support environmental objectives while maintaining reliable municipal supply. In non-call years, the City emphasizes surface water use where available to support groundwater basin recovery, reinforcing long-term sustainability and alignment with regional groundwater management goals. Similar arrangements are being considered for the pending Healthy Rivers and Landscapes program (see Section 3.6.3).

The City overlies two subbasins of the Sacramento Valley Groundwater Basin as defined by the "Department of Water Resources (DWR) in Bulletin 118, California's Groundwater": the North American Subbasin (Subbasin No. 5-21.64; hereafter "NASb"), located north of the American River, and the South American Subbasin (Subbasin No. 5-21.65; hereafter "SASb"), located to the south of the American River. Together, these subbasins underlie the City's entire service area and form the basis of local groundwater management and planning efforts. Each subbasin has distinct hydrogeologic conditions, patterns of urban and agricultural use, and management frameworks that influence how the City operates its municipal wells.

Since the preparation of the 2020 UWMP, groundwater management in both subbasins has advanced substantially under the Sustainable Groundwater Management Act (SGMA). The Sacramento Groundwater Authority (SGA) serves as the Groundwater Sustainability Agency (GSA) for the portion of the NASb within Sacramento County, and the Sacramento Central Groundwater Authority (SCGA) fulfills that role for the SASb. Both agencies completed Groundwater Sustainability Plans (GSPs) in 2022, establishing measurable objectives, sustainability indicators, and minimum thresholds to maintain groundwater conditions consistent with SGMA. The City continues to coordinate closely with these agencies through data sharing, monitoring participation, and policy development to ensure City conjunctive use remains consistent with subbasin sustainability goals.

The City operates a network of municipal supply wells distributed across both subbasins to provide reliable groundwater production capacity. Since 2020, the City has advanced its Well Replacement Program, analyzed under the 2024 Final Environmental Impact Report (EIR), to systematically replace aging wells, improve treatment reliability, and sustain long-term production capacity. The program supports implementation of recommendations from the City's 2017 Groundwater Master Plan and aligns with GSP sustainable yield targets.

With sustainable yield estimates of 336,000 AFY for the NASb and 235,000 AFY for the SASb,[60] these groundwater resources remain a viable asset for the City. As a legally protected component of the City's water supply portfolio, they provide immediate operational benefits while also offering long-term strategic value for water banking, drought resilience, and surface water asset preservation.[61]

3.3.1. North American Subbasin

The NASb lies north of the American River and extends from the Bear River on the north to the Sacramento River on the west, bounded on the east by the Sierra Nevada Foothills' bedrock, a north–south line running toward Folsom Lake. **Figure** 3-5 depicts the NASb and the City of Sacramento limits. The subbasin underlies portions of Sacramento, Placer, and Sutter Counties and includes a mix of urban and agricultural land uses. The North American Subbasin Groundwater Sustainability Plan (NASb GSP) divides the subbasin into three distinct areas – Western, Central, and Eastern – based on differences in groundwater conditions. These variations are primarily influenced by the availability of surface water across the areas.

The geology of the subbasin consists of a thick sequence of continental deposits that form an extensive, generally unconfined aquifer system in the upper 300 feet and a semi-confined aquifer system below. The principal water-bearing units include the Quaternary Alluvium, and the Riverbank, Turlock Lake, Modesto, and Laguna Formations, with deeper semi-confined zones associated with the Mehrten Formation.

[60] The sustainable yield for the NASb is 336,000 acre-feet per year (AFY), and for the SASb is approximately 235,000 AFY on average, ranging from 210,000 to 270,000 AFY in a given year (SGA–GSA et al., 2021; NDGSA et al., 2021; City of Sacramento, *Well Replacement Program Draft EIR*, 2023).
[61] The City of Sacramento filed its first statement of cessation of or reduction in the extraction of groundwater per CWC Section 1005.4 in 2025.

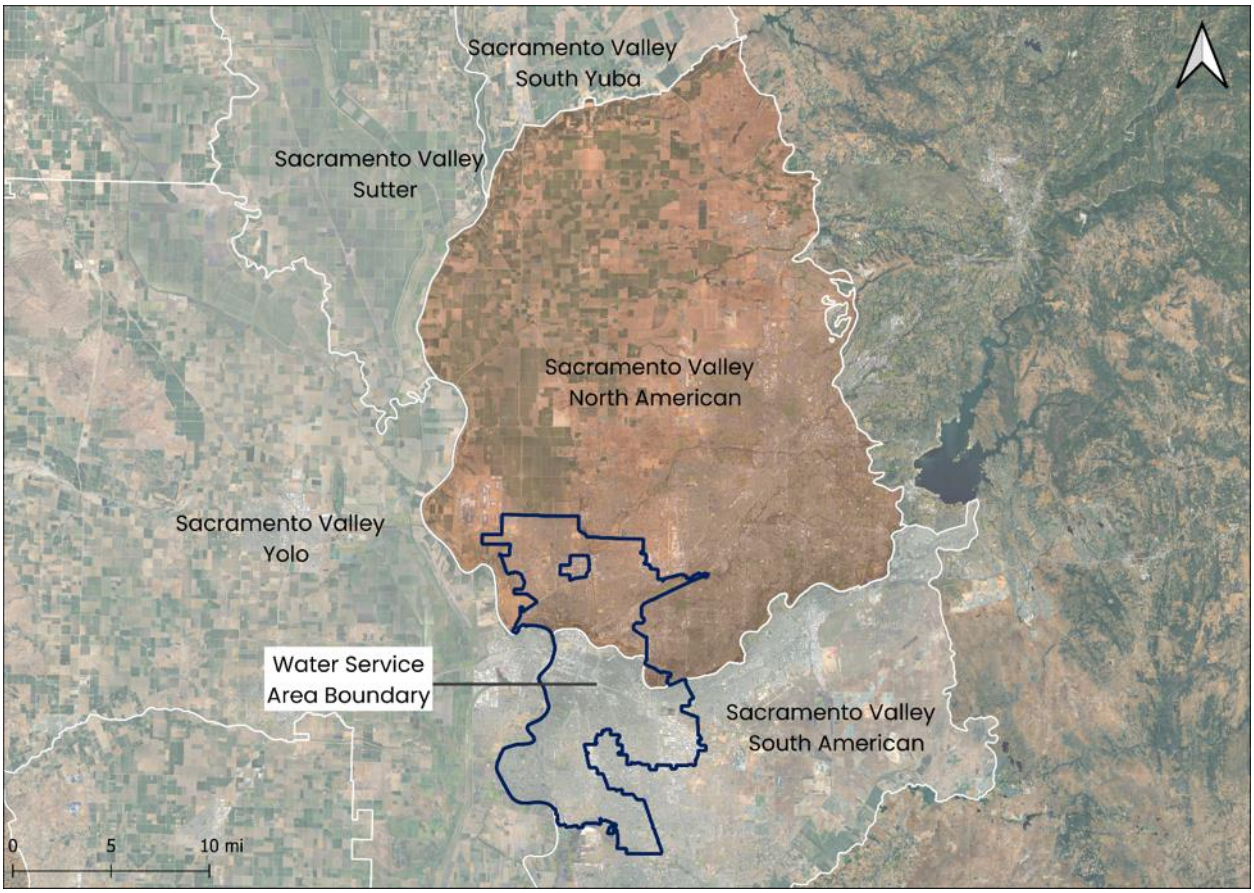


FIGURE 3-5: NORTH SUBBASIN WITHIN THE SACRAMENTO VALLEY BASIN – NORTH AMERICAN SUBBASIN

3.3.2. South American Subbasin

The South American Subbasin lies south of the American River and extends to the Cosumnes and Mokelumne Rivers on the south, the Sierra Nevada foothills on the east, and the Sacramento River on the west. The subbasin encompasses much of central and southern Sacramento County and includes extensive urbanized areas as well as agricultural lands. **Figure** 3-6 depicts the SASb and the City of Sacramento limits. The geologic formations in the South American Subbasin are similar to those in the North American Subbasin, with younger unconsolidated alluvial deposits overlying the semi-consolidated Mehrten Formation.

The geologic formations underlying the SASb are similar to those of the North American Subbasin (NASb), consisting primarily of younger unconsolidated alluvial deposits overlying the semi-consolidated Mehrten Formation. The SASb contains one primary aquifer system that is commonly divided into an upper and lower aquifer. The upper aquifer is typically used for private domestic and small irrigation wells, while the lower aquifer yields greater production rates of high-quality water, supporting larger municipal supply wells.

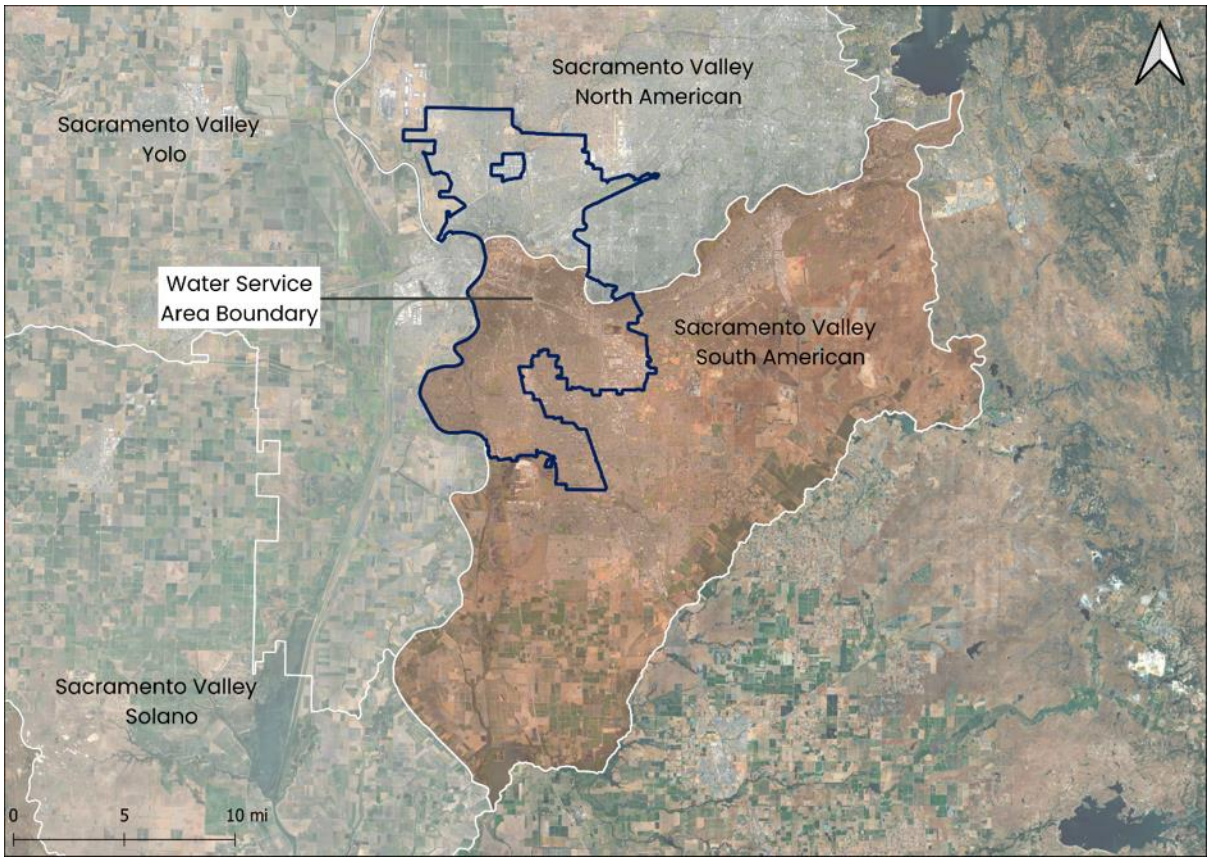


FIGURE 3-6: SOUTH SUBBASIN WITHIN THE SACRAMENTO VALLEY BASIN – SOUTH AMERICAN SUBBASIN

3.3.3. Management and Conjunctive Use

The City participates in regional planning groups and plays a leadership role in several sustainability initiatives and programs affecting groundwater resources management.

Sacramento Groundwater Authority

SGA serves as the GSA for the portion of the subbasin within the City boundary. The North American Subbasin GSP, adopted in 2022, establishes measurable objectives and sustainability criteria for groundwater levels, storage, quality, and subsidence. Within the City, groundwater elevations have become stable in the mid-2010s, and no chronic lowering of water levels or significant water-quality degradation has been reported.[62] In fact, groundwater levels have been increasing recently due to groundwater banking (see Sacramento Regional Groundwater Bank section below). The City continues to participate in SGA's regional monitoring network and contributes data from municipal wells to support basin-wide assessments and annual reporting to DWR.

[62] Woodard & Curran, Inc. (2023). Draft Environmental Impact Report. Page 3.9-3.

Sacramento Central Groundwater Authority

Groundwater management within the SASb is coordinated by SCGA. SCGA was formed through a Joint Powers Agreement, which includes the City and serves as the SASb GSA. SCGA's jurisdiction covers the majority of the SASb and some adjacent portions of the Consumnes Subbasin. SCGA's membership includes public agencies, private water purveyors, and groundwater users from multiple sectors, all of whom rely on sustainable groundwater to support their communities and operations. The South American Subbasin GSP, also adopted in 2022, establishes sustainability thresholds and management actions to maintain groundwater levels, prevent water-quality degradation, and avoid significant land subsidence. The City participates in SCGA activities through inter-agency coordination and supports the GSP's data-collection and implementation framework.

Regional Water Authority

The Regional Water Authority (RWA) is a Joint Powers Authority formed in 2001 to provide a regional forum for addressing water resource issues in the greater Sacramento–Placer region. RWA represents approximately two dozen water providers and affiliated agencies, including 21 water supplier members and three associate members across Sacramento, Yolo, Placer, and El Dorado Counties. Although implementation of the Water Forum Agreement was a primary driver in its formation, RWA's role has expanded to include regional coordination on water supply reliability, conjunctive use, groundwater management, and water conservation.

RWA assists its member agencies in implementing the conjunctive use, groundwater management, and water conservation provisions of the Water Forum Agreement and facilitates coordinated responses to emerging water management challenges. In 2002, RWA assumed responsibility for managing operations of the Sacramento Groundwater Authority, further strengthening its role in regional groundwater management and conjunctive use activities.

The City of Sacramento is an active RWA member and participates in regional water management initiatives through both RWA and the Sacramento Groundwater Authority. The City contributes to regional conjunctive use strategies, groundwater sustainability planning, and coordinated water supply reliability efforts, and supports broader initiatives such as the Sacramento Regional Water Bank to help align local groundwater operations with basin-wide sustainability and regional water management objectives.

Sacramento Regional Water Bank

The Sacramento Regional Water Bank (RWB) is a regional groundwater storage and recovery program being developed by a coalition of local water agencies, including the City of Sacramento and the Regional Water Authority (RWA). Led by RWA, the RWB is designed to store excess surface water in underground aquifers during wet years and recover it during dry periods. By using the region's aquifers as a natural storage system, the RWB is expected to provide storage capacity exceeding twice that of Folsom Reservoir, strengthening regional water supply reliability and resiliency.

Conjunctive use in the Sacramento region has evolved over the past three decades through coordinated groundwater management and regional reliability efforts. In the NASb, conjunctive use was formalized under the Water Forum Agreement to maintain sustainable groundwater yield, coordinate pumping among participating agencies, protect groundwater quality, and promote basin-wide management. In the SASb, local agencies implemented conjunctive use to diversify supplies, address groundwater contamination risks, and improve overall reliability.

Building on these efforts, RWA is leading development of the RWB to expand and coordinate conjunctive use across the North and South American Subbasins. Through groundwater banking and recovery, the RWB provides a regional framework to enhance water supply reliability for local communities while supporting ecosystem function along the lower American River.

Long-term conjunctive use and groundwater banking in the NASb and SASb have increased groundwater levels and supported sustainable basin conditions. Higher groundwater levels have supported contributions to streams, enhancing baseflow in regional rivers, particularly the American River, and increasing subsurface inflows to adjacent subbasins. After more than three decades of coordinated management, these efforts have contributed to stable groundwater conditions and supported DWR approval of the GSPs for both subbasins.

As a result of these long-term conjunctive-use practices, a substantial volume of groundwater has been stored over time. Within the context of RWB operations, this stored groundwater is referred to as Previously Banked Water (PBW). While PBW represents an important regional water supply asset, stored groundwater both affects and is affected by interconnected rivers and adjacent groundwater subbasins. Consequently, volumes of previously banked water must be reconciled to account for hydrologic interactions such as stream seepage, boundary flows, and interbasin exchange before determining the portion of

PBW that remains recoverable for future use. These interactions and their implications for groundwater banking are documented in the *Analysis of Previously Banked Water* (2025).[63]

Six agencies have submitted PBW documentation meeting RWB eligibility criteria. In the North American Subbasin, these agencies are California American Water, Carmichael Water District, the City of Sacramento, and Sacramento Suburban Water District. In the South American Subbasin, Golden State Water Company and Sacramento County Water Agency qualify. Together, they represent the initial participants in the RWB.

Applying the adopted eligibility, verification, and hydrologic reconciliation procedures, total verified PBW as of September 30, 2024, is estimated at approximately 468-thousand-acre feet (TAF) in the NASb and 431 TAF in the SASb, for a combined total of about 899 TAF. After accounting for net contributions to surface water systems and adjacent subbasins, recoverable in-basin PBW is estimated at approximately 248 TAF in the NASb and 222 TAF in the SASb, for a total of about 471 TAF available for potential recovery under the RWB framework. **Table** 3-13 summarizes the verified total PBW balances and the adjusted in-basin PBW volumes by agency and subbasin.

TABLE 3-13: INITIAL PBW BALANCES AS OF SEPTEMBER 2024 AND VOLUMES OF PBW REMAINING

Agency	PBW (AF)	In-Basin PBW (AF)
North American Subbasin		
California American Water Company	17,102	9,100
City of Sacramento	90,035	47,800
Carmichael Water District	91,887	48,800
Sacramento Suburban Water District	268,541	142,600
North American Subbasin – Subtotal	***467,565***	***248,300***
South American Subbasin		
Golden State Water Company	215,166	110,800
Sacramento County Water Agency	216,327	111,500
South American Subbasin – Subtotal	***431,493***	***222,300***
TOTAL	**899,058**	**470,600**

[63] Regional Water Authority (RWA). 2025. *Sacramento Regional Water Bank: Analysis of Previously Banked Water*. Version 1, September 10, 2025. Prepared by Woodard & Curran.

The remaining in-basin PBW provides important benefits. Elevated groundwater storage supports aquifer health, advances GSP objectives, and provides drought resilience and operational flexibility. Higher groundwater levels also reduce the need for deep pumping, lowering energy use, greenhouse gas emissions, and operating costs.

Conjunctive use has also produced measurable regional and environmental benefits beyond the subbasin boundaries. Hydrologic interactions have increased stream baseflows and subsurface outflows to adjacent basins. Over the 27-year evaluation period, conjunctive use increased regional baseflows by an average of approximately 13.8 TAF per year, for a cumulative total exceeding 386.9 TAF. In the Lower American River, average annual baseflow increases are estimated at about 11.4 TAF, totaling more than 318.4 TAF over the same period, consistent with objectives of the Water Forum Agreement.

Although some PBW has migrated through natural hydrologic processes, these actions have generated substantial regional benefits while leaving a significant volume of recoverable groundwater to support future water supply reliability through the Sacramento RWB.

3.3.4. Groundwater Wells and Supply

Groundwater remains a key component of the City of Sacramento's water supply portfolio, historically meeting about 15 to 20 percent of total annual demand, although this percentage has decreased in recent years. As wells are replaced, it is expected that groundwater use will rebound to these levels at some point in the future, especially in critical drought conditions. While surface water from the Sacramento and American Rivers is the City's primary source under its appropriative permits and pre-1914 entitlement, groundwater provides flexibility during dry periods and when surface water supplies are limited by hydrologic, regulatory, or voluntary constraints.

The City's groundwater management approach is guided by the 2017 Groundwater Management Plan and adopted Environmental Impact Report, which established a Well Replacement Program to maintain reliable production capacity, particularly during dry and critically dry years that may become more frequent with climate change. The program supports supply reliability, system redundancy, and portfolio diversification, and enables strategic conjunctive use to help sustain regional surface and groundwater resources.

The ongoing Well Replacement Program aims to restore the City's historical capacity and total yield by replacing or modernizing aging wells in both the NASb and SASb. When fully implemented, the replacement program will enhance operational redundancy, improve water quality consistency, and maintain the City's ability to meet projected groundwater demands through 2045.

Both the NASb and the SASb are designated by DWR as high-priority basins under SGMA but are not in critical overdraft. Groundwater Sustainability Plans for both subbasins were submitted in 2022 and approved in 2023, establishing sustainable management criteria, minimum thresholds, and long-term groundwater budgets. Modeling prepared for the GSPs and the City's Well Replacement Program indicates that current and projected pumping will not cause chronic water level declines or long-term storage deficits.[64] Continued GSP implementation and coordinated basin management are expected to maintain sustainable conditions, allowing groundwater to remain a reliable component of the City's supply portfolio throughout the UWMP planning horizon.[65]

Historical Groundwater Production

The City's groundwater pumping is part of a conjunctive use strategy and occurs within the NASb and the SASb. Most historical groundwater production has occurred in the NASb, consistent with the location of the City's older wellfields and historical land use patterns. Over time, groundwater pumping patterns have evolved as new wells have been constructed, older wells have been retired, and surface water treatment capacity has expanded.

The City's understanding of historical groundwater use is supported by the CoSANA regional integrated groundwater–surface water model, which incorporates decades of land use, hydrologic, and operational data. Under the "Existing Conditions Baseline" hydrologic simulation (based on water years 1970–2019), the City's pumping patterns can be summarized as follows:

North American Subbasin: The City's historical groundwater pumping in the NASb averages approximately 20,000 acre-feet per year (AFY). Pumping is higher during dry and critically dry years, ranging from about 13,800 AFY in wet years to over 41,000 AFY in the driest years.[66]

[64] The Technical Memorandum demonstrates that groundwater budgets, long-term storage trends, groundwater levels, and SGMA sustainability criteria remain consistent with the adopted GSPs, and that the proposed Well Replacement Program does not result in undesirable results or conditions indicative of overdraft. Sections 3.1–3.6 and Section 4.

[65] The Technical Memorandum states that the Well Replacement Program is already incorporated into the GSP Projected Conditions scenario and "is not expected to impact the sustainable management of either subbasin according to SGMA," further demonstrating consistency with long-term sustainable groundwater conditions.

[66] Woodard & Curran. (2023). City of Sacramento Groundwater Modeling Technical Memorandum. *Table 4: North American Subbasin Annual Groundwater Pumping by Water Year Type under Existing Conditions Baseline, No Project Scenario, and Preferred Scenario*.

South American Subbasin: The City's historical groundwater pumping in the SASb averages approximately 4,200 AFY, with annual volumes ranging from about 1,700 AFY in wet years to nearly 12,000 AFY in dry and critically dry years.[67]

Citywide Total: Combined groundwater production under historical conditions averages 24,200 AFY, with total pumping ranging from about 15,500 AFY in wet years to more than 53,000 AFY during the driest hydrologic conditions.[68]

Groundwater Use – Past Five Years

The number of current wells that are active, inactive, or out of service changes over time due to ongoing operations, rehabilitation, changes in water quality regulations, and construction activities. The City also owns and operates 17 irrigation/park supply wells. These irrigation wells are not recognized as potable supply and therefore are not submitted as part of the City's monthly reporting to the SWRCB SAFER Clearinghouse or summarized in the annual auto-generated Clearinghouse Annual Inventory Report (CAIR Report).

Historical retail groundwater pumping from 2021 through 2025 from each subbasin is shown in **Table** 3-14**.**

TABLE 3-14: RETAIL GROUNDWATER VOLUME PUMPED (ACRE-FEET PER YEAR)

Basin Name	2021	2022	2023	2024	2025
North American Subbasin (No. 5-21.64)	17,440	17,630	10,840	8,295	5,534
South American Subbasin (No. 5-21.65)	1,397	1,394	1,392	1,563	1,071

The City's wholesale water supply agreements are primarily supported by surface water, but in some instances, conjunctive use fulfills wholesale demands. Historical groundwater deliveries are summarized in **Table** 3-15 below.

TABLE 3-15: WHOLESALE GROUNDWATER VOLUME PUMPED (ACRE-FEET PER YEAR)

Basin Name	2021	2022	2023	2024	2025
North American Subbasin	815.7	758.7	755	826	866

[67] Woodard & Curran. (2023). City of Sacramento Groundwater Modeling Technical Memorandum. *Table 5: South American Subbasin Annual Groundwater Pumping by Water Year Type under Existing Conditions Baseline, No Project Scenario, and Preferred Scenario*.

[68] Woodard & Curran. (2023). City of Sacramento Groundwater Modeling Technical Memorandum. *Table 6: City of Sacramento Total Annual Groundwater Pumping by Water Year Type under Existing Conditions Baseline, No Project Scenario, and Preferred Scenario*.

Projected Groundwater Use

Groundwater will continue to support the City's conjunctive use strategy throughout the UWMP planning horizon, providing flexibility under variable hydrologic conditions. Future production assumptions are based on the 2017 Groundwater Master Plan, the adopted Groundwater Sustainability Plans for the North American and South American Subbasins, the Well Replacement Program, and regional modeling conducted with the CoSANA integrated groundwater and surface water model.

As described previously, the Well Replacement Program will modernize aging wells to restore the City's historical capacity and total yield. The program also allows for a shift in a portion of production from the NASb to the SASb. This shift is reflected in the CoSANA Preferred Project Scenario evaluated in the Environmental Impact Report, which represents a conservative upper bound of future groundwater use while remaining consistent with SGMA and the GSPs.[69]

The Preferred Project Scenario reflects an upper-bound modeling condition in which groundwater is assumed to meet demands prior to the use of available surface water supplies. This approach is used for modeling purposes to test basin response under higher pumping levels and is not intended to represent typical annual operations. This scenario effectively simulates continuous operation of the City's well system at or near 90 percent production capacity (i.e., all available wells operating) and is intended to evaluate basin response under sustained high pumping conditions in severe dry periods (beginning year 3 of a multi-year drought). It does not represent typical or expected annual operations.

Under this scenario, average annual groundwater pumping is projected to be approximately 38,700 AFY citywide.[70] In the North American Subbasin, average pumping remains near 20,000 AFY, generally consistent with historical levels. In the SASb, average pumping increases to about 20,000 AFY due to replacement well capacity and the planned production shift.

During dry and critically dry years, modeled groundwater production may increase substantially, with the total pumping reaching approximately 81,000 AFY when groundwater supplies a larger share of demand.[71]

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[69] The future planning period for the EIR groundwater modeling is based on the City's 2040 projections from the 2015 UWMP, consistent with the GSP modeling analysis.

[70] Woodard & Curran. (2023). City of Sacramento Groundwater Modeling Technical Memorandum. *Table 6.*

[71] Woodard & Curran. (2023). City of Sacramento Groundwater Modeling Technical Memorandum. *Table 6.*

Model results indicate that these projected pumping levels remain within sustainable limits. Simulated groundwater elevations stay above minimum thresholds established in the GSPs, storage trends remain stable, and no undesirable results are triggered over the 50-year modeling period. This analysis demonstrates that the subbasins can accommodate the City's projected groundwater use through the UWMP planning horizon while maintaining compliance with SGMA.

Accordingly, projected groundwater use reflects both a conservative sustainability evaluation and the City's continued reliance on conjunctive management to maintain a reliable and adaptable water supply portfolio through 2050 and beyond.

Table 3-16 depicts the City's projected groundwater use from 2026 to 2030 in dry year conditions, and **Table** 3-17 shows projected groundwater use over the planning horizon multi-year droughts.

TABLE 3-16: PROJECTED GROUNDWATER FROM 2026-2030 (ACRE-FEET PER YEAR)[72]

Year Type		Supply Available
Normal		21,645
Single Dry-Year		31,054
Multi-Year Drought	2026	31,054
	2027	31,054
	2028	48,953
	2029	48,953
	2030	53,726

[72] Based on the Existing Conditions Baseline Pumping from the City of Sacramento Groundwater Modeling Technical Memorandum Table 6. May not reflect City's current active well status. Assumes increased yield of 29 permitted wells in the Existing Conditions scenario.

TABLE 3-17: PROJECTED GROUNDWATER – 2050 PLANNING HORIZON[73]

Year Type		2030	2035	2040	2045	2050
Normal		35,864	35,864	35,864	35,864	35,864
Single Dry-Year		47,690	47,690	47,690	47,690	47,690
Multi-Year Drought	Year 1	47,690	47,690	47,690	47,690	47,690
	Year 2	47,690	47,690	47,690	47,690	47,690
	Year 3	81,290	81,290	81,290	81,290	81,290
	Year 4	81,290	81,290	81,290	81,290	81,290
	Year 5	81,290	81,290	81,290	81,290	81,290

3.4. Other Water Sources

California Water Code Sections 10631(g) and 10633 require urban water suppliers to describe and quantify all water sources beyond primary surface water and groundwater supplies, including wastewater collection, treatment, and disposal systems; the potential for recycled water use; opportunities for desalinated water development; and any purchased or imported water supplies. The following subsections address each of these supply categories as they apply to the City of Sacramento's service area. This section also provides narrative on water transfer activity.

3.4.1. Indirect Water Reuse and Recycled Water

Wastewater Collection, Treatment, and Disposal

The City's DOU collects and conveys wastewater from residential, commercial, and industrial customers for treatment and disposal which is provided by SacSewer at the EchoWater Facility. The City currently collects and transports wastewater through two systems, the City's Combined Sewer System (CSS) and the City's Separated Sewer System (SSS). Most of the wastewater collected from the CSS and all of the wastewater collected in the SSS is delivered to the EchoWater Facility.

About 57,600 AF of wastewater was collected in the City's service area in the 2025 Fiscal Year, shown in **Table** 3-18 below.

[73] Based on the Preferred Project Scenario from the 2023 City of Sacramento Groundwater Modeling Technical Memorandum (Table 6). The 81,290 AF represents a maximum theoretical pumping condition, assuming continuous operation of all 42 wells at approximately 90% capacity in the absence of other supplies. This scenario was evaluated and determined to be within the sustainable yield constraints of the GSP.

TABLE 3-18: RETAIL WASTEWATER COLLECTED WITHIN SERVICE AREA IN 2025

Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2025	Name of Wastewater Treatment Plant (WWTP)	Is WWTP Located Within UWMP Area?
City of Sacramento	Estimated	516	City of Sacramento	Yes
City of Sacramento	Estimated	18	City of Sacramento	Yes
City of Sacramento	Estimated	32,000	SacSewer	No
SacSewer	Estimated	25,000	SacSewer	No
Total Wastewater Received from UWMP Service Area in 2025:		57,534		

NOTES: Units are in acre feet (AF). Combined wastewater treatment plant includes flow from stormwater as it is a combined system. Volume collected is for the 2025 fiscal year, July 2024 through June 2025.

Combined Sewer System

Constructed between the late 1800s and 1946, the Combined Sewer System (CSS) serves residences and businesses within approximately 11,240 acres of the City. Of this area, about 7,540 acres, generally within Downtown, East Sacramento, and Land Park, contribute both sanitary sewage and storm drainage flows to the CSS. The remaining 3,700 acres, generally within East Sacramento, River Park, and Tahoe Park, contribute only sanitary sewage. Although these areas originally conveyed combined flows, the sanitary sewer and storm drainage systems were separated in the 1950s to improve operations by diverting stormwater to a dedicated system.

The CSS includes approximately 345 miles of pipe ranging from 4 to 120 inches in diameter. Flows are conveyed westward to two major pump station complexes, Pump Station 1/1A/1B and Pump Station 2/2A, located near the Sacramento River. Pump Stations 1B and 2A operate continuously throughout the year, while Pump Stations 1, 1A, and 2 operate only during significant storm events. Additional City facilities include the Pioneer Reservoir, an offline storage basin that also provides primary treatment, and the Combined Wastewater Treatment Plant (CWTP), which provides primary treatment with a capacity of 130 mgd. Pioneer Reservoir has a peak hydraulic capacity of approximately 350 mgd and a treatment capacity of about 250 mgd.

The City maintains an agreement with SacSewer that allows conveyance of up to 60 mgd to the EchoWater Facility for tertiary treatment. While this agreement historically supported discharge to the Sacramento River, current operations primarily direct this water for

groundwater recharge in the southern portion of the service area and recycled water applications. This capacity is sufficient to treat all dry weather sanitary flows from the CSS, approximately 12 to 16 mgd, as well as flows from low intensity storm events. During moderate to large storms, when flows exceed 60 mgd, excess volumes are routed to the CWTP and/or Pioneer Reservoir for storage and primary treatment. When storage capacity is exceeded, flows that have received primary treatment, including chlorination and dechlorination, are discharged to the Sacramento River. If both storage and treatment capacities are fully utilized, additional CSS flows may be discharged directly to the river from Sump 2 and/or Sump 1. Primary treatment consists of mechanical settling to remove oil and approximately 50 percent of settleable solids.

Effluent treated at the CWTP and Pioneer Reservoir does not meet recycled water quality standards because treatment is limited to primary processes. In addition, these facilities operate intermittently during major storm events and therefore do not provide a reliable supply for recycled water customers.

As shown in **Table** 3-19, Pioneer Reservoir treated 534 AF of wastewater for the 2025 fiscal year that was discharged. CWTP had 18 AF of discharges in the 2025 fiscal year.

TABLE 3-19: RETAIL WASTEWATER TREATMENT AND DISPOSAL WITHIN SERVICE AREA IN 2025

Wastewater Treatment Plant Name	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area?	2025 Volume of Wastewater Received from UWMP Service Area	Total 2025 Volume of Water Treated
Pioneer Reservoir	No	516	516
CWTP	No	18	18
	Total	534	534

NOTES: Units are in acre feet (AF). Pioneer and CWTP provide primary treatment only during large storm events. Volume collected is for the fiscal year, July through June.

Separated Sewer System

In addition to the Combined Sewer System, the City operates a Separated Sewer System within approximately 60 percent of the area outside the CSS service boundary. The remaining areas of the City are served by the Sacramento Area Sewer District (SacSewer), which also provides service to most of Sacramento County. The City's Separated Sewer System consists

of approximately 482 miles of pipeline ranging from 4 to 36 inches in diameter and 48 pump stations. Figure 6-2 illustrates the area served by the Separated Sewer System.

Flows collected by the City's Separated Sewer System are conveyed through an interceptor system of large diameter pipelines and pump stations to the EchoWater Facility for treatment and disposal. The interceptor system and the EchoWater Facility, located just south of the City limits, are owned and operated by SacSewer.

EchoWater Facility

The EchoWater Facility, located near Elk Grove, provides tertiary treatment for approximately 1.6 million residents in the region. The facility treats an average of 135 million gallons of wastewater per day. Following completion of a comprehensive, multi-year upgrade, EchoWater now removes about 99 percent of ammonia and 89 percent of nitrogen from influent wastewater, significantly improving effluent quality for discharge and recycled water applications.

Current, Potential, and Projected Recycled Water Uses

In 2020, Regional San (now operating as SacSewer following a merger) completed construction of a six-mile recycled water pipeline from the former Sacramento Regional Wastewater Treatment Plant, to deliver recycled water to the SPA Cogen Facility near the intersection of Franklin Boulevard and 47th Avenue. The SPA Cogen Facility is located outside the City limits but within the City's American River Place of Use. The SPA Cogen Facility relies on potable water supplied by the City for cooling tower operations and to serve as a backup for flushing higher-saline water.

Recycled water deliveries to the SPA Cogen Facility began in 2020, with approximately 29 AF delivered that year. Deliveries have increased over time as the system has ramped up, reaching approximately 331 AF in 2025. Future deliveries are anticipated to reach approximately 1,000 AFY by the year 2030, however, expansion of the recycled water system is undetermined at this time. Current and projected recycled water use is summarized in **Table** 3-20 below. The City does not currently distribute or provide supplemental treatment to wholesale recycled water and does not plan to do so in the future.

TABLE 3-20: RETAIL RECYCLED WATER SUPPLY

Use Type	General Description	2025	2030	2035	2040	2045	2050
Industrial Use	SPA Cogen Facility	331	1,000	1,000	1,000	1,000	1,000

Note: Values are in acre-feet (AF).

3.4.2. Desalinated Water

The UWMP requires discussion of opportunities for the development of desalinated water.[74] The City is not pursuing desalinated water or brackish groundwater development because no seawater or brackish groundwater sources are available in the area.

3.4.3. Purchased or Imported Water

Although not typical, the City does occasionally import water. For example, as part of its conjunctive use program, the City participates in groundwater substitution transfers. In 2022, a regional coalition, consisting of the City of Sacramento, Carmichael WD, Citrus Heights WD, Fair Oaks WD, San Juan WD, Sacramento Suburban WD, and Sacramento County Water Agency, reduced surface water diversions in lieu of utilizing locally banked groundwater. This surface water was left in stream to provide critical water needs to south-of-delta State Water Project Contractors.[75]

- Water Right Permit 11360 (Application 12622) of the City, transferred up to 5,183 acre-feet of water to Santa Clara Valley Water District and various other State Water Contractors.
- Water Right Permit 11359 (Application 12621) of the City, transferred up to 5,183 acre-feet of water to Santa Clara Valley Water District and various other State Water Contractors.

The regional effort transferred approximately 16,000 acre-feet from July 1, 2022 to November 30, 2022 from the Sacramento region to State Water Contractors that were at risk of experiencing water shortages in 2022.

A separate Conjunctive Use agreement between the City, SSWD, and SCWA accompanied the aforementioned transfer. Under that agreement, the City received groundwater from SSWD and SCWA during the transfer window through existing interties to satisfy City water demands. These volumes of groundwater provided a credit for water to be returned to SSWD and SCWA to allow those agencies to reduce groundwater pumping for aquifer recharge.

The City's conjunctive use program includes a similar arrangement with SSWD and SCWA during ARTESIAN Call Years in which those two agencies provide the City groundwater in lieu of diverting surface water to meet City demands. The ARTESIAN agreement is discussed in more detail in Chapter 2.

[74] *Water Code Section 10631(g)*

[75] Resolution No. 2022-0160. Sacramento City Council, dated 31 May 2022.

3.5. Water Quality

Water quality for both groundwater and surface water supplies is reported annually in the City's Consumer Confidence Report (CCR), which is available on the City's website. As documented in the CCR, the City's drinking water consistently meets or exceeds all federal and state drinking water standards.

The City maintains a proactive approach to protecting water quality and addressing potential constraints on its water supply sources. The City's Water Quality Laboratory and Research and Development Section conducts ongoing water quality evaluations and studies to assess and respond to changing conditions, including those related to drought, climate variability, and watershed influences. The City also participates in source water protection programs that help safeguard the quality of supplies from the American and Sacramento Rivers through both local and regional efforts.

Water quality in the Sacramento and American Rivers can be influenced by a variety of watershed conditions, including storm events, reservoir releases, irrigated agriculture, livestock activities, urban runoff, recreation, forest fire runoff, and point source discharges. These factors can affect source water characteristics such as turbidity, coliform bacteria, Giardia and Cryptosporidium, organic carbon, volatile and semi-volatile organic compounds, and metals including aluminum, iron, and manganese. The City routinely monitors both raw and treated water quality, and the water treatment plants are designed and operated to reliably produce drinking water that meets all applicable regulatory standards. In addition, the Sacramento and American River Watershed Sanitary Surveys, which are updated every five years, confirm that the City's treatment facilities are capable of treating source water to meet all regulatory requirements. As a result, source water quality is not expected to limit the reliability of the City's surface water supplies.

Groundwater underlying the City's service area generally meets primary and secondary drinking water standards for municipal use and is typically characterized as a calcium-magnesium-bicarbonate type water with minor fractions of sodium-magnesium-bicarbonate water, as described in the Department of Water Resources Bulletin 118. While groundwater quality is generally good, conditions vary across the basin depending on location and aquifer depth.

Several regional groundwater contamination sites are located within the broader Sacramento area and in the vicinity of some City wells. The primary sources of larger contaminant plumes include the former Southern Pacific and Union Pacific Railyards, the former McClellan Air Force Base, the former Mather Air Force Base, and the Aerojet Superfund Site in Rancho Cordova. Contaminants associated with these sites include benzene, methyl

tert-butyl ether (MTBE), trichloroethene (TCE), tetrachloroethene (PCE), cis-1,2-dichloroethene (DCE), 1,4-dioxane, 1,2-dichloroethane, carbon tetrachloride, perchlorate, and N-nitrosodimethylamine (NDMA). With the exception of PFAS, additional localized areas of contamination also occur throughout the basin, generally at smaller scales.

The City conducts routine groundwater monitoring to track water quality conditions in both existing and newly constructed wells. As wells are rehabilitated or returned to service, some areas have shown elevated concentrations that are managed through operational monitoring and treatment considerations.

In addition to existing water quality conditions, groundwater supplies may be affected by future regulatory requirements. Potential future regulations related to constituents such as radon could influence groundwater supply availability or treatment requirements. The City participates in regional groundwater management and technical working groups to help develop strategies that protect and sustainably manage groundwater resources in the Sacramento area.

The City will continue to regularly monitor groundwater quality and proactively address regulatory changes to minimize potential impacts on groundwater supply reliability.

The City is engaging in recycled water activities in collaboration with SASD, although plans to expand this system are currently undetermined. Based on current planning and treatment design standards, the City may need to contend with PFAS as a water quality constraint prior to future expansion. Recycled water activities and potential use expansion are described in Section 3.4.

3.6. Water Supply Portfolio Assessment

The City of Sacramento holds a diverse portfolio of water supplies and entitlements, including the pre-1914 appropriative right and appropriative permit on the Sacramento River, and the four permits on the American River. Though the City's permit supplies are subject to hydrologic conditions and flow criteria embedded in the water rights, storage operations on the Sacramento and American Rivers provide a layer of reliability. As such, water supplies up to the maximum diversion amounts and rates listed in the USBR Operating Contract are considered reliable in all year types. As such, **Table** 3-21 and **Table** 3-22 display the combined contract amount provided for in Operating Contract.[76]

[76] The City recognizes that climate variability, diversion restrictions that are embedded in the City's water rights permits, among other variables, introduce uncertainty into long-term seasonal water availability.

TABLE 3-21: SURFACE WATER SUPPLY AVAILABILITY IN VARYING YEAR TYPES THROUGH 2030 (ACRE-FEET)

Year Type		Sacramento River	American River	Total
Normal		81,800	228,000	309,800
Single Dry-Year		81,800	228,000	309,800
Multi-Year Drought	2026	81,800	231,500	313,300
	2027	81,800	235,000	316,800
	2028	81,800	238,500	320,300
	2029	81,800	242,000	323,800
	2030	81,800	245,000	326,800

TABLE 3-22: FUTURE PROJECTED TOTAL SURFACE WATER SUPPLY AVAILABILITY THROUGH 2050 (ACRE-FEET)

Year Type		Sacramento River	American River	Total
Normal		81,800	245,000	326,800
Single Dry-Year		81,800	245,000	326,800
Multi-Year Drought	2030	81,800	245,000	326,800
	2035	81,800	245,000	326,800
	2040	81,800	245,000	326,800
	2045	81,800	245,000	326,800
	2050	81,800	245,000	326,800

3.7. Watershed Resilience

The water supply availability tables presented in this chapter characterize the City of Sacramento's entitlements and projected supply volumes under normal, single-dry-year, and five-consecutive-dry-year conditions. Those tables necessarily present supply data on an annual basis by source category. However, a static presentation of volumes does not fully convey the operational and strategic considerations that govern how the City manages its multi-watershed portfolio over time. This section provides context for interpreting the supply availability data by describing the City's Climate Adaptation and Watershed Resilience strategy, the physical and regulatory risks that drive it, and the critical long-term asset preservation rationale that underlies the City's approach to water rights stewardship well beyond the UWMP horizon of 2050.

3.7.1. Climate Adaptation

When evaluating long-term water supply reliability, the City considers extreme hydrologic conditions within the broader context of a changing climate, evolving regulatory and environmental requirements, and the state's reasonable use doctrine and public trust obligations.[77] Climate change is altering the fundamental sources of the City's surface water supplies, specifically the precipitation type and amount, runoff patterns, and soil moisture content within the American River watershed. Warming is a consistent signal across future climate scenarios, directly affecting whether precipitation falls as rain or snow and accelerating snowmelt timing. These changes reduce the effectiveness of snowpack as natural storage and shift runoff to occur earlier in the year, increasing operational constraints during flood control periods during the winter. Supply availability is also reduced as a result of warming during spring and summer when urban, agricultural, and environmental demands are the highest.

Figure 3-7 shows the projected percent change in basin average annual precipitation relative to baseline conditions across three future time periods. Climate projection data were obtained from Appendix B of the American River Basin Study and represent basin wide averages for the entire American River Basin Study area as defined in the ARBS.[78] Colored lines represent five climate scenarios developed for the American River Basin Study (ARBS): Central Tendency (CT), Hot Dry (HD), Hot Wet (HW), Warm Dry (WD), and Warm Wet (WW). The dashed gray line indicates baseline (0 percent change) conditions.

[77] California Constitution: Article X, Water Section 2

[78] Bureau of Reclamation. *American River Basin Study*, Appendix B, Table 3, "Differences in basin-average annual precipitation and temperature between baseline and future climate scenarios over the ARBS study area."

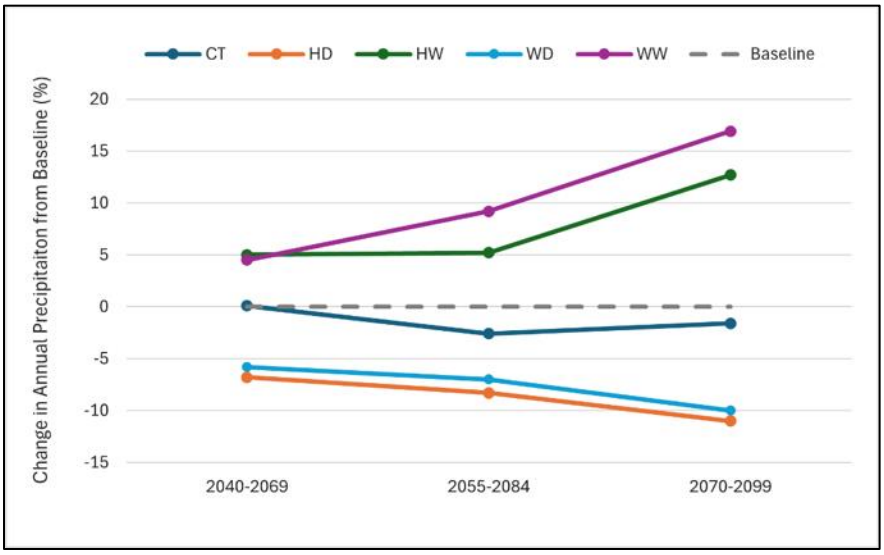

FIGURE 3-7: IMPACTS OF CLIMATE CHANGE ON THE AMERICAN RIVER BASIN STUDY AREA

Precipitation projections for the Sacramento region remain uncertain, with climate models showing a wide range of possible futures, from wetter to drier conditions. However, both the American River Basin Study and state climate assessments indicate increased hydrologic variability and more extreme swings between drought and flood conditions. [79] Seasonal shifts toward more winter rainfall and reduced spring snowpack exacerbate flood risk while also impacting supply reliability. The City's Climate Action & Adaptation Plan (CAAP) recognizes that these temperature-driven changes, combined with higher evapotranspiration and water demand during hotter conditions, introduce risks to water quantity and quality, system operations, and infrastructure reliability.[80] In response, the City evaluates its water supplies over an extended planning horizon beyond 2050 to better reflect future climate conditions, regulatory constraints, and land-use growth. This approach strengthens the usefulness of long-range planning for coordinated decision making.

The City addresses these risks through an intentional focus on climate resiliency and supply redundancy, consistent with their Climate Adaptation and Watershed Resilience platform. Conjunctive-use management, in coordination with the Sacramento Regional Water Bank, offsets the loss of natural snowpack storage by capturing excess wet-season surface water for underground storage and recovery during droughts. Regional initiatives like the DWR Watershed Resilience Pilot with RWA and watershed scale resilience planning further diversify supply portfolios while integrating flood management, ecosystem protection, and upstream

[79] Bureau of Reclamation *American River Basin Study*, Appendix B
[80] City of Sacramento Climate Action and Adaptation Plan, Chapter 7

watershed quality.[81] At the system level, the City is updating critical infrastructure through new raw-water intakes, ozone treatment to address changing river water quality, safer disinfection processes, and transmission improvements designed to maintain operational reliability under changing hydrologic conditions.[82] These actions holistically reflect a proactive adaptation strategy that acknowledges climate change as a structural driver of water supply risk and prioritizes redundancy and long-term reliability for future growth, environmental protection, and regulatory compliance.

3.7.2. Infrastructure and Catastrophic Disruption Planning

In addition to hydrologic and regulatory variability, the City's supply system faces physical risks from infrastructure failure, seismic events, security threats, and other catastrophic disruptions. The City's Sacramento and American Rivers conveyance and treatment systems involve significant infrastructure that, if disrupted, could eliminate access to supply from one or more watershed sources for an extended period. The E.A. Fairbairn Water Treatment Plant and Sacramento River Water Treatment Plant each serve as critical points in the City's surface water delivery system. A failure affecting either facility—or the raw water conveyance infrastructure serving it—would immediately concentrate reliance on the remaining operational source.

The Sacramento region sits within a seismically active zone, and portions of the City's service area and conveyance infrastructure are within or adjacent to 100-year and 200-year floodplain areas. The operation of Folsom Dam and the Sacramento Weir bypass system directly affect water availability and flood management for City facilities. The City also relies on SMUD's UARP infrastructure to provide conveyance and re-diversion from storage across watersheds. Critical Infrastructure failure scenarios are, by definition, unpredictable in timing and magnitude. Prudent municipal water supply management requires that the City maintain access to supply alternatives across multiple watersheds, so that no single point of infrastructure failure eliminates the City's ability to serve its customers.

The City's groundwater system provides an additional layer of supply redundancy that operates independently of surface water infrastructure. However, groundwater alone is insufficient to meet peak demands under the City's current and projected service area, and its role is most effective as a conjunctive-use buffer rather than a primary supply source.

[81] https://rwawatershedsresilience.com/

[82] Water+ Treatment Plants Resiliency and Improvements Project Final Draft Environmental Impact Report, Chapter 1.2: Summary of Proposed Project

The City's strategy is to ensure that each water asset in its portfolio retains its full operational value as an emergency, redundancy, and long-term reliability resource, even in years when operational conditions favor concentration of diversions in another watershed.

3.7.3. Bay Delta Plan

The Bay-Delta Water Quality Control Plan Update (Plan) is a pending State Water Resources Control Board (State Board) action that could impact water supplies that connect to the Sacramento-San Joaquin Bay Delta (Delta). Although the Plan has not yet been adopted, the various proposed State Board actions could affect each urban water purveyor's water supply reliability. The Healthy Rivers and Landscapes Program is an alternative to the Plan and provides opportunities for urban purveyors to meet the Plan's aquatic species and water quality objectives through coordinated regional management activities. In addition, the Plan has numerous post-adoption water management activities, such as cold-water storage and management, that are to-be-determined as the Plan is implemented. These to-be-determined management actions could impact how water supplies are made available to each urban purveyor. Finally, the Plan appears to exempt some tributaries and other geographical areas from strict adherence to the Plan or HRL Program that would not affect long-term urban water planning projections.

The water supply reliability projections described in this Urban Water Management Plan update reflect characterizations of water supplies and demands as they exist based upon reasonably available information. Although the Plan, HRL Program, and post-Plan water management adjustments could change UWMP water supply reliability projections, the water supply implications are not yet suitable for analytical integration into the current water supply reliability projections for this UWMP iteration. Once the Plan or HRL Program is adopted, and post-adoption implementation actions become better known, the projections for urban water supply reliability can be reasonably calculated. It is anticipated that the 2027 through 2030 iterations of Annual Assessments will guide urban purveyors in assessing near term impacts of the Plan on water supply reliability and generate useful information that can be incorporated into the next UWMP update in 2030.

Chapter 4
Water Use

Developing a thorough understanding of water use enables the City to reliably and cost-effectively manage its water supplies to continue to meet customer needs. This chapter characterizes the City's current and forecasted customer water needs and examines how various factors such as seasons, current and projected land use, wholesale demands, and differing hydrologic conditions impact water use. The assessment also factors in anticipated growth, evolving customer water use behaviors, a changing regulatory environment, and climate adaptation. After analyzing each water use sector individually, the City aggregates this information into a comprehensive customer water use projection. This projection forms the foundation for integration with the City's water supplies (see Chapter 3) and for evaluating long-term water system reliability (see Chapter 5).

As discussed previously in this plan, there have been no legislative changes to the UWMPA since the adoption of the City's 2020 UWMP, however updates to annual water use reporting have been implemented. These include Urban Water Use Objective (UWUO) reports, and monthly drought and conservation reporting to the Safe and Affordable Funding for Equity and Resilience (SAFER) portal that are consolidated annually into an auto-generated Clearinghouse Annual Inventory Report (CAIR).

This Chapter is organized as follows:

Current Retail Customer Water Use – This subsection presents data reflecting the City's residential and non-residential customers for 2021 through 2024 as well as the actual 2025 water use and presents the distribution system losses for this same period.

Wholesale Customer Use – This subsection provides a description of current and projected future wholesale water service within the City's water supplies' place of use.

Compliance with Water Use Targets – This subsection provides an update in context of the 2020 SBX7-7 water use target, along with an overview and compliance with the state's Urban Water Use Objective.

Forecasting Customer Use – These subsections present the derivation and results of future water use forecasts for potable water within the City's service area, including land-use classifications, unit demand factors, and estimation of distribution system

losses. An overview of factors affecting future use along with the variations in customer water use the City should expect during years with low rainfall are also included in this section.

Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to California Water Code §10631.1.

Long-Range Demand Scenarios – This subsection provides high-level considerations of potential water demands well into the future. These long-term demands are important to consider in the context of the City's Climate Adaptation and Watershed Resilience framework that is driving water management strategy and long-range planning.

4.1. Retail Customer Water Use

As described in Chapter 2, the City serves potable water to approximately 145,403 customer connections. Since the adoption of the 2020 UWMP, the customer connection count also includes fire service connections. The City has been essentially fully metered as of 2021, with approximately 99.8 percent of connections metered.[83]

Under normal circumstances, customers are served potable water derived from surface water sources (see Chapter 3) diverted and treated at EAFWTP and SRWTP, and various groundwater sources. Information about the City's current customers, their recent and expected water use trends, and the City's ongoing Demand Management Measures (DMMs) targeting these customers (see Chapter 7 for DMMs) ground this UWMP's water use forecast through 2050 and beyond. Furthermore, annual records of actual water use are the basis for determining the City's compliance with its urban water use objective, reported annually to the Department of Water Resources beginning in January of 2024. This subsection presents relevant retail water use information.

As both a retailer and a wholesaler, the City's current water use can be distinguished by retail and wholesale production. This section presents the City's retail customer use. Wholesale customer use is presented and analyzed in subsection 4.2. The actual retail customer water use data for 2021 through 2024 is shown on **Table** 4-1, whereas the retail customer water use data for 2025 is shown on **Table** 4-2.

[83] City of Sacramento, Water Master Plan Update, January 2023 (West Yost.), at p. 2-15.

4.1.1. Retail Customer Water Use: 2021 to 2024

Recent customer water use data can help the City understand water use trends, effects of the most recent prolonged drought and recovery from any drought impacts, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. Additionally, the City is required to quantify past customer water use pursuant to Water Code Section 10631(d)(1). As mandated by the state, this monthly water use information is also reported as part of the City's SAFER reporting, in their Annual Assessments, and to demonstrate compliance with UWUO.

Table 4-1 presents the City's past customer potable water use by customer classification for 2021 through 2024 in acre-feet. The City records potable water use within five different categories:

- Single-Family Residential
- Multi-Family Residential
- Commercial/Industrial/Institutional
- Landscape Irrigation
- Other

These classifications reflect the delivery categories in the City's initial eAR reporting, which presents the City's commercial, industrial, institutional, and water demands as a single, combined "CII" demand. The "Other" category represents a range of small, non-standard uses such as hydrant flushing and street sweeping. The City does not provide non-potable supplies to retail customers.

Included within the City's retail CII and Landscape Irrigation categories are deliveries made to Natomas Unified School District, a small, relatively new wholesale customer. Due to a metering error, these deliveries were included within the City's retail metering. Deliveries to this service area represent less than 0.05% of the annual CII and Landscape Irrigation totals but are presented independently in section 4.2.2 to avoid double-counting deliveries made to this service area.

TABLE 4-1: RETAIL POTABLE CUSTOMER USE (2021-2024)

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2021	2,412	2,142	2,154	3,176	4,072	4,919	5,094	4,717	4,652	3,916	2,498	2,096	41,850
	2022	2,008	2,080	2,507	2,859	2,968	4,068	4,381	4,578	4,209	3,476	2,787	2,208	38,129
	2023	2,334	2,032	2,133	2,343	3,300	4,410	5,264	5,375	5,016	4,038	3,439	2,658	42,341
	2024	1,943	1,929	1,874	2,244	2,663	4,288	4,724	4,760	4,516	3,866	3,020	2,061	37,890
Multi-Family Residential	2021	816	727	724	1,068	1,501	1,666	1,792	1,832	1,832	1,642	1,114	893	15,608
	2022	872	875	954	1,102	1,026	1,292	1,387	1,453	1,437	1,240	1,063	943	13,645
	2023	1,060	942	989	1,049	1,199	1,489	1,715	1,728	1,746	1,455	1,376	1,171	15,920
	2024	856	884	863	992	1,094	1,446	1,556	1,655	1,643	1,414	1,197	940	14,541
Commercial/ Industrial/ Institutional	2021	1,123	1,022	1,163	1,556	2,179	2,507	2,750	2,630	2,612	2,139	1,323	1,108	22,111
	2022	1,116	1,106	1,438	1,547	1,652	2,068	2,139	2,317	2,260	1,875	1,466	1,233	20,216
	2023	1,434	1,182	1,183	1,311	1,674	2,058	2,494	2,681	2,517	2,057	1,728	1,377	21,698
	2024	981	988	1,119	1,292	983	2,361	2,335	1,829	2,420	2,096	1,621	885	18,911
Landscape Irrigation	2021	101	95	95	163	267	350	365	338	344	282	141	92	2,633
	2022	54	91	221	282	349	625	731	778	722	484	267	96	4,701
	2023	93	76	86	115	391	732	974	1,071	1,028	675	388	120	5,748
	2024	221	205	39	77	521	544	682	1,385	735	537	246	360	5,554
Other	2021	31	25	28	49	64	77	101	80	77	68	34	25	657
	2022	14	20	24	31	44	68	102	109	92	59	32	23	617
	2023	16	18	16	22	48	108	105	103	129	86	47	21	720
	2024	13	21	21	31	48	87	105	114	119	87	43	17	707
Total Metered Deliveries	2021	4,484	4,011	4,164	6,012	8,083	9,520	10,103	9,596	9,517	8,047	5,110	4,214	82,860
	2022	4,064	4,172	5,145	5,821	6,039	8,121	8,739	9,235	8,720	7,134	5,615	4,502	77,307
	2023	4,938	4,249	4,406	4,841	6,613	8,797	10,552	10,958	10,437	8,310	6,979	5,347	86,428
	2024	4,013	4,028	3,917	4,637	5,310	8,727	9,402	9,744	9,433	8,000	6,127	4,263	77,602

The historical data illustrates the distribution of water use across customer classifications and highlights notable seasonal variations. For example, water use for landscape irrigation shows a significant increase during summer, with volumes rising from an average of 117 acre-feet in January to over 688 acre-feet on average in July, before declining to a 167-acre-foot average in December. This pattern reflects the higher demand for irrigation during warmer months, while winter rainfall generally meets landscape water needs.

Residential water use also demonstrates this trend. Single-family residential usage consistently accounts for a sizeable portion of the City's annual potable water demand, with summer uses nearly double those of winter. When combined with multi-family residential

use, residential consumption averages just under 70% of the City's total potable water service. Compared to previous projections, these water use characteristics have remained relatively consistent throughout the last 10 years.

A year-over-year comparison of total metered deliveries highlights the combined impacts of COVID-19 and drought conditions in 2021, when indoor water use was high across all customer categories.

These seasonal fluctuations in response to hydrologic conditions alongside the dominance of residential demand relative to other customer classes provide the City with valuable insight for evaluating the seasonal reliability and resilience of its water supplies. Recognizing that not all historical projections will remain consistent, leveraging these trends enables the City to develop successful water management approaches and water shortage contingency response actions with as customer classes and economic trends change.

4.1.2. Retail Customer Water Use in 2025

Retail customers served by the City are metered at their connection to the City's potable water distribution system. As of January 1, 2024, for each customer account, the City is required to collect and submit metered delivery values to the State Water Board on a monthly basis, summarized annually in an auto-generated CAIR Report. This data was formerly submitted as part of the City's annual reporting to the SWRCB Division of Drinking Water and to DWR. Although those reports are still required, requirements shall be modified by the State Board to avoid duplicative reporting.[84]

The 2025 actual retail customer use presented in **Table** 4-2 represents the summarized delivery to all the City's potable customers. It does not, however, include the distribution system losses inherent in a pressurized water delivery system that occur during the City's efforts to treat, store and route the water throughout the extensive distribution system to each customer's connection.

Compared to water use presented in **Table** 4-1, 2025 annual customer use remains generally consistent across all categories. Landscape irrigation was the only category exhibiting a noticeable increase, showing 1,104 acre-feet increase in 2025 from 2024, although the total use was about the same between the two years.

[84] The annual SWRCB report is referred to as the 'electronic Annual Report' or eAR, and the annual DWR report is known as the Public Water System Statistics report.

TABLE 4-2: POTABLE CUSTOMER WATER USE: 2025 ACTUAL USE (VALUES IN ACRE-FEET)

Use Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2,167	1,992	1,963	2,384	3,482	4,019	4,711	4,555	4,549	3,477	2,572	2,010	37,880
Multi-family Residential	1,040	961	947	1,014	1,283	1,365	1,563	1,560	1,560	1,330	1,106	941	14,671
Commercial/Institutional	1,108	848	1,032	1,235	1,718	1,945	1,616	2,198	2,198	1,770	1,295	1,056	18,018
Landscape Irrigation	106	307	105	157	489	771	1,579	981	981	841	243	100	6,658
Other	15	14	14	21	68	95	102	106	0	68	30	13	546
Total	**4,436**	**4,122**	**4,062**	**4,810**	**7,041**	**8,195**	**9,570**	**9,399**	**9,287**	**7,486**	**5,246**	**4,120**	**77,774**

4.1.3. Existing Distribution System Losses

Distribution system water losses (also known as "real losses") are the physical water losses from the City's water distribution system up to the point of delivery to the customer's system (i.e., up to the residential water meter).

Since 2016, the City has been required to quantify its distribution system losses using the American Water Works Association (AWWA) Method.[85] An electronic copy of the audit in Excel format is to be submitted to the DWR by October 1 of each year for the prior year's estimated system losses, using DWR's online submittal tool pursuant to Code of Regulations Section 638.5. Although the AWWA-based audit remains in effect as the primary tool for monitoring distribution system losses, mandated water loss reductions are on the horizon with the SWRCB's April 1, 2023 adoption of volumetric water loss performance standards. Pursuant to California Code of Regulations, Section 966, the SWRCB will require suppliers to reduce real loss by January 1, 2028 to no greater than the real water loss standard calculated in its 2027 audit.[86] After 2028, the City shall assess compliance every three years as an average of recent real losses. Additionally, the City will be required to evaluate apparent losses and submit an inventory of apparent losses should average losses exceed the real water loss standard.

As discussed below in Section 4.2.2, a new water use efficiency framework established as part of Senate Bill 606 and Assembly Bill 1668 directly integrates "aggregate estimated efficient water losses" as a component. Importantly, because water loss is subject to enforcement under Section 10608.34, SWRCB will not issue enforcement orders under the Urban Water Use Objectives solely based on exceedances due to water loss.

[85] Title 23 California Code of Regulations Section 638.1 et seq.

[86] CCR, Title 23, § 966, Urban Water Use Objectives.

Pursuant to DWR's 2025 recommendations, these distribution system losses are losses reported as part of DWR's Water Loss Audit Program.[87] Due to the time lag associated with AWWA reporting, the 2025 estimate for the City has not been officially submitted to DWR as of the drafting of this UWMP.

As can be anticipated given the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year-to-year and month to month. Over the last five years, however, the City has consistently reported loss values at or below their water loss standard. To maintain a conservative planning approach and accommodate potential data fluctuations in the future, system losses are assumed to be 10% when projecting water demand through 2050.

4.1.4. Water Loss Control Standard

The CWC §10608.34 required the State Water Resources Control Board to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The Real Water Loss Standard for the City was developed using information submitted as part of the City's annual water loss reporting to the State, specifically for the period 2017 through 2020. The resulting Real Water Loss Standard is 41.1 gallons per (active and inactive) service connection per day. The resulting Real Water Loss Standard as an average percent of total water supplied during this timeframe is 8.2%. Using the information from the same period, the average "apparent" water loss averaged 2.0% (of total water supplied). Apparent water loss refers to non-physical water losses, part of the AWWA "non-revenue water" category, that encompasses meter inaccuracies, data errors, and unauthorized consumption. Combining these real and apparent water loss as a percentage of total water supplied gives a total of 10.2%. As previously mentioned, the City will use a 10% distribution system water loss factor when forecasting future water use.

4.2. Wholesale Customer Water Use

In addition to serving retail customers, the City also wholesales water and provides wheeling services to other agencies. On average, approximately 85 percent of the City's water use served retail customers, and 15 percent was wholesaled to California American Water Company, Sacramento Suburban Water District, and SCWA's Sacramento International Airport/Metro Air Park, or wheeled for SCWA's Zone 40. Wholesale and wheeling deliveries are

[87] See the City of Sacramento Department of Utilities AWWA Worksheet, submitted annually to DWR's WUEdata - Water Audit Report Data (WUEdata - Water Audit Plans).

made through metered turnouts connected to the City's existing distribution infrastructure. The City also has unmetered emergency interconnections with neighboring agencies.

As previously shown in **Figure** 2-5, the City's Place of Use (POU) for wholesale water extends beyond that of retail deliveries. Water delivered to areas outside the City boundary align with the delivery locations assigned to each surface and groundwater supply. Some additional water supplies may be available for use in these areas in the future.

4.2.1. Wholesale Customer Water Use: 2021 to 2025

Recent wholesale deliveries to the City's current wholesale customers between 2021 and 2025 are summarized in this section and shown in

Table 4-3. Cal-Am received a combined total of 2,203 AFY across five service area turnouts, just under half of the combined 4,831 AFY contracted capacity. SCWA received 3,824 AFY of water at the Laguna/Vineyard (Zone 40) and International Airport/Zone 50 Metro Air Park turnouts. SSWD received deliveries through their Northrop Drive turnout, representing approximately one third of their contracted 22,400 AFY South Service Area capacity. Since 2020, between 16 and 33 acre-feet of water was delivered to Natomas Unified School District annually, representing less than half of the 69 AF of annual deliveries projected in the 2020 UWMP. As previously discussed, deliveries to this wholesale service area were grouped into the City's retail deliveries, presented in **Table** 4-1 and **Table** 4-2.

Actual water use by the City's wholesale customers between 2021 and 2025 is summarized in

Table 4-3, classified both by purveyor and turnout location. Annual deliveries made to NUSD are also shown but are not included in the wholesale totals to avoid double-counting.

TABLE 4-3: WHOLESALE POTABLE CUSTOMER WATER DELIVERIES (ACRE-FEET)

	Year	2021	2022	2023	2024	2025
Cal-Am	Cal-Am Arden	11	11	8	3	6
	Cal-Am Fruitridge Vista (47th)	120	86	9	6	42
	Cal-Am Fruitridge Vista (Sampson)	494	211	190	152	419
	Cal-Am Parkway	676	377	660	722	1,074
	Cal-Am Suburban (Folsom)	629	333	495	654	661
	Cal-Am Rosemont	-	-	-	-	-
SCWA	SCWA Zone 40 Laguna/Vineyard	1,772	-	-	2,616	2,927
	SCWA International Airport/ Zone 50 Metro Air Park	816	759	755	826	896
SSWD	SSWD Sac Suburban (Northrop)	-	-	7,472	6,124	7,280
NUSD	Natomas Unified School District	33	22	26	33	16
Totals		**4,518**	**1,777**	**9,589**	**11,102**	**13,306**

Existing Wholesale Losses

The City uses the same system to distribute water to retail and wholesale customers. Losses associated with the City's wholesale water service are essentially accounted for in its retail distribution system losses, discussed in Section 4.1.3. Furthermore, water usage and the associated losses inherent with any pressurized distribution system are reported in the individual plans of the City's wholesale and wheeling customers.

4.3. Compliance with Water Use Targets and Objectives

This section examines the City's derivation of and compliance with state-mandated water use targets and objectives. The Water Conservation Act of 2009, also known as SB X7-7, introduced water conservation targets that served as a valuable measure of progress through 2020. Water use efficiency regulations have since been updated and refined by Senate Bill 606 and Assembly Bill 1668, guiding the calculation of "urban water use objectives", as well as the City's annual reporting on these objectives starting in 2023.

4.3.1. Compliance with 2020 Urban Water Use Target

SB X7-7, also known as the Water Conservation Act of 2009, introduced sustainable water use and demand reduction legislation requiring the City to make incremental progress in reducing per-capita water use. Specifically, urban water retailers were tasked with achieving a 10% reduction in per capita water use by December 31, 2015, and a 20% reduction by December 31, 2020. Beyond 2020, although reporting on compliance is no longer required, this target remains valuable as a baseline for the City to measure progress on achieving water efficiency goals.

The City's 2015 GPCD interim target was established in the 2015 UWMP as 253 GPCD, whereas the City's actual retail per capita water use in 2015 was 158, demonstrating compliance with this target. In 2020, the City's 2020 final water use target was calculated to be 225 gpcd.[88] The City's calculation of their 2020 actual GPCD used the following methodology:

> Gross water, defined as the total potable water leaving the City's water treatment plant, represents both the customer deliveries and the distribution system losses. This value is divided by the City's estimated population in 2020 and resulted in a compliance value of 169 GPCD.

Because this value was less than the City's 225-gpcd target, the City was determined to be in compliance with CWC Section 10608.24(b).

Although not required by the Act, in 2025, the City had an actual GPCD of 159, calculated using the same methodology presented above. Moving forward, the City is required to maintain compliance with its 2020 GPCD target for urban water management planning purposes.

4.3.2. Urban Water Use Objective Compliance

In 2018, the California Legislature passed Senate Bill 606 and Assembly Bill 1668, directing the SWRCB to adopt standards to encourage more efficient urban water use. This legislation, known as "Making Conservation a California Way of Life," was adopted in 2024, establishing individualized Urban Water Use Objectives for each urban retail water supplier. In contrast to the SB X7-7 per-capita targets, this legislation functions as a water budget tailored to a supplier's service area, considering residential indoor use, residential and commercial outdoor use based on local evapotranspiration and irrigable landscape area, water loss, and bonus incentives for potable reuse. In addition to the volumetric UWUO, the regulation

[88] Derived from the City of Sacramento's Water Master Plan Update, adopted in January 2023, prepared by West Yost

establishes performance measures for commercial, industrial, and institutional (CII) sectors. The standards become progressively more stringent through 2040. Compliance with efficiency-based UWUOs aligns with both the City's Demand Management Measures detailed in Chapter 7 and the adaptive management strategies outlined in the City's Water Shortage Contingency Plan (WSCP) in Chapter 6.

In each of the first three reporting years, the City submitted required annual reports to the SWRCB demonstrating that actual water use remained below its calculated UWUO, confirming compliance in 2023, 2024, and 2025.

4.4. Forecasting Retail Customer Water Use

Current water use, including existing retail customer demands and trends, provides the basis for forecasting future demands. Growth and development represent an additional set of demands that will augment total projected water use. Demand factors that will influence future water use of both existing and new customers are then incorporated into the methodology to determine future demands across the planning period.

Pursuant to California Water Code 10610.4(c), an urban water supplier "*shall be required to develop water management plans to actively pursue the efficient use of available supplies*." As such, the future water use projections for both existing customers and those added over the 25-year planning horizon should reflect the "efficient use" of water.

An important effort related to the City's customer water use and preparation of the City's 2025 UWMP, is the City's Water Master Plan Update, adopted in January of 2023 (2023 WMP).[89] The 2023 WMP provides vetted demand projections, based upon future development estimates and unit water use factors refined based on recent, post-drought water use trends as well as water use efficiency and water conservation efforts. These projections also account for a future drought rebound factor and are incorporated into the 2025 UWMP forecast.

4.4.1. Existing and Future Retail Demand Projection Methodology

Forecasting future water use requires a thorough analysis of existing retail customer demands, as this representative water use serves as the foundation for estimating the future needs of these existing customers.

Aside from existing customers, the main factor influencing future retail customer water use is future growth. The 2023 WMP anticipated growth to occur within both Opportunity Areas and non-Opportunity Areas, with the latter representing new demands associated with infill

[89] City of Sacramento Water Master Plan Update, January 2023. West Yost, Project No. 038-60-19-53.

projects and/or previously developed land. To estimate the City's future water demands, the 2023 WMP used a combination of land use data, sourced from the City's 2035 General Plan and 2040 General Plan, as well as unit water use factors developed from historical water use data.

This UWMP also considers developments not previously accounted for in the preparation of the City's 2020 UWMP and 2023 WMP. To provide flexibility and conservative coverage throughout the development process, a blanket water use demand factor is used, calculated using recent water and land use data within the County. Applying this demand factor to the acreage of known developments not previously accounted for in the 2023 WMP, while maintaining previous projections as-is, brings 2023 WMP projections within the City service area up to date. For other areas proposed for development outside of the City limits, this demand factor can be used to assess the City's resources should the City serve additional retail demands or beyond their existing retail service area.

Future water use forecasts for both existing and new retail customers consider ongoing water conservation objectives regulated by the State and implemented by the City, discussed in Section 4.4.2.

Representative Current Retail Water Use

As mandated by the state, actual monthly retail customer water use data presented on **Table 4-1** and **4-2** is also reported as part of the City's SAFER reporting, in their Annual Assessments, and to demonstrate compliance with UWUO. Using this information, a representative "current" water use by existing customers can be estimated. Developing this estimate requires acknowledging how and why actual use varies slightly year-to-year. This estimate is influenced by a variety of factors, from the timing of spring rain events impacting when landscape irrigation may begin to how the City's population adjusted throughout the course of the Covid-19 pandemic. In addition to accounting for some of these variations, the City also has a desire to conservatively assure long-term water system reliability, as described in Chapter 5.

For this UWMP, the City's actual retail customer water use for 2021 was used to represent current conditions; incorporating water use during times of drought provides a conservative baseline and represents anticipated future climate conditions throughout the planning horizon.

Table 4-4 provides the representative monthly and annual current potable retail water use, not including distribution system losses.

TABLE 4-4: REPRESENTATIVE CURRENT WATER USE FROM 2021 (ACRE-FEET)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
4,484	4,011	4,164	6,012	8,083	9,520	10,103	9,596	9,517	8,047	5,110	4,214	82,860

4.4.2. Factors Affecting Future Customer Use

There are multiple factors that affect the forecasted future customer use, including state and local landscape regulations, building code requirements, water-use mandates, new housing developments, and existing water conservation programs. These factors are incorporated into determining appropriate per-dwelling unit or per customer connection water demand values for use in forecasting future water needs. Relevant characteristics of the factors are described here.

Water Conservation Objectives

In response to multi-year drought conditions, Governor Brown issued Executive Order B-37-16 entitled "Making Water Conservation a California Way of Life." In May 2018, when Governor Brown signed SB 606 and AB 1668 into law, additional statutory requirements were imposed above and beyond the 20 percent by 2020 target reflected in the 2009 legislation. The City met this mandated target. As described in section 4.3.2, to demonstrate compliance with its Urban Water Use Objective, efforts to increase water use efficiency and ultimately to reduce water demands of existing and future water users are and will continue to be of high priority to the City.

The City's approach to water conservation is also closely tied to their 2025 Water Efficiency and Conservation Plan, which presents a long-term framework designed to guide responsible water use management through 2055.[90] Objectives of this plan are to increase customer participation in water-saving programs, enhance existing rebate and outreach initiatives, and implement new measures developed in coordination with the Regional Water Authority and Sacramento Water Forum. These initiatives, discussed further in Chapter 7 and Appendix C, are designed to be adaptable as regulatory requirements and climate conditions evolve. The City's existing and planned conservation objectives are anticipated to exert continued downward pressure on per-capita water use over the planning period, an important consideration in forecasting future customer use as the service area population increases.

[90] City of Sacramento Water Efficiency and Conservation Plan, Maddaus Water Management, Inc., November 2025.

Requirements in California Building Code

Beginning in January 2010, the California Building Standards Commission adopted the statewide mandatory Green Building Standards Code (hereafter the "CAL Green Code") requiring the installation of water-efficient indoor and outdoor infrastructure for all new projects after January 1, 2011. The CAL Green Code was incorporated as Part 11 into Title 24 of the California Code of Regulations and was updated in 2016, 2019, and 2022. Revisions to the CAL Green Code in 2019 modified sections to direct users to MWELO regulations contained in other regulatory sections.[91]

The CAL Green Code applies to the planning, design, operation, construction, use and occupancy of every newly constructed or remodeled building or structure. All new residential and non-residential customers must meet the water use requirements of the CAL Green Code as well as the outdoor requirements described by MWELO.

The CAL Green Code's indoor requirements generally manifest through: (1) installation of plumbing fixtures and fittings that meet the 20 percent reduced flow rate specified in the CAL Green Code, or (2) by demonstrating a 20 percent reduction in water use from the building "water use baseline."[92] The Proposed Project will satisfy these indoor requirements through the use of appliances and fixtures such as high-efficiency toilets, faucet aerators, on-demand water heaters, or other fixtures, as well as Energy Star and California Energy Commission-approved appliances. Outdoor requirements are discussed in the following subsection.

California Model Water Efficient Landscape Ordinance and City Ordinance

DWR's Model Water Efficient Landscape Ordinance (MWELO) governs new development and retrofitted landscape water efficiency standards. All retail water suppliers or counties are required to adopt the MWELO or enact their own provisions that are equal to or more restrictive than the MWELO provisions.[93] The City's Water Efficient Landscape Ordinance

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[91] The 2019 updated sections to direct CAL Green code users to Title 23 of the California Code of Regulations to allow Title 23 to be the sole location of MWELO requirements.

[92] See CAL Green Code. For Residential construction, Section 4.303.1 provides the residential water conservation standard and Table 4.303.2 identifies the infrastructure requirements to meet this standard. Table 4.303.1 and Worksheets WS-1 and WS-2 are to be used in calculating the baseline and the reduced water use if Option 2 is selected. For non-residential construction, Section 5.303.2.3 provides the water conservation standard as well as the baseline and reduced flow rate infrastructure standards. Note that Worksheets WS-1 and WS-2 incorporate both residential and non-residential fixtures, yet the water use is still to be analyzed by "building or structure" as specified in Chapter 1, Section 101.3.

[93] Sacramento City Code § 15.92, "Water Efficient Landscape Requirements," Sacramento, CA, accessed February 25, 2026, https://codelibrary.amlegal.com/codes/sacramentoca/latest/sacramento_ca/0-0-0-29495

implements the State's MWELO through locally codified requirements. The most recent MWELO update in January of 2025 repealed several sections and added a distinction in compliance options for new construction projects between 500 and 2,500 square feet of landscape area and those with 2,500 square feet or more of landscape area.[94]

The MWELO provides a methodology to calculate total water use based upon a given plant factor and irrigation efficiency or sets forth the Maximum Applied Water Allowance ("MAWA") formula to use if project landscaping details are lacking. Additionally, if using the plant factor basis, the MWELO requires the landscape design plan to delineate hydrozones (based upon plant factors) and then to assign a unique water use value for each hydrozone (low, medium, high).[95]

Prohibition on Non-Functional Turf

In 2023, the Legislature determined that the use of treated, potable drinking water for irrigating decorative or aesthetic landscaping that serves no recreational or public use is inefficient and inconsistent with state water conservation and climate resilience objectives.[96] Under CWC §10608.12(m), "nonfunctional turf" (NFT) is defined as "a ground cover surface of turf located in a recreational use area or community space. Turf enclosed by fencing or other barriers to permanently preclude human access for recreation or assembly is not functional turf". This definition explicitly excludes cemeteries, parks, sports fields, and lawns that are regularly used for recreation or community gathering.[97]

The prohibition on NFT applies primarily to commercial, industrial, institutional, and municipal properties, as well as common areas maintained by homeowners' associations and common interest developments.[98] Potable water may continue to be used to maintain the health of trees and other perennial, non-turf landscaping, and where irrigation is necessary to address immediate public health or safety concerns. For example, potable irrigation may be allowed where discontinuation would compromise fire prevention or fuel reduction efforts, dust control, or other measures needed to protect human health and safety.

Implementation of the NFT provisions is phased over several years and may be enforced at the local level by public water systems, cities, and/or counties.[99] Non-compliance of the NFT

[94] CCR Tit. 23, Div. 2, Ch, 2.7, Sec. 491.2
[95] CCR Tit. 23, Div. 2, Ch. 2.7, Secs. 490.2
[96] In 2025 provisions of Assembly Bill 1572 were codified into the California Water Code.
[97] CWC §10608.12
[98] Per Civil Code §4100, common interest developments are defined as community apartment projects, condominium projects, planned developments, and stock cooperatives.
[99] CWC §10608.14

provisions may result in civil penalties imposed on property owners, or other locally defined enforcement actions.

Initial compliance begins in 2026, with progressively broader property categories subject to the prohibition through 2030 and beyond, including later deadlines for properties located in disadvantaged communities.[100] In 2026, public water systems are required to update local ordinances and customer policies to reflect the new restrictions.

The following timeline outlines the dates set forth by the CWC and corresponding requirements:

By January 1, 2027: Public water systems must update local ordinances, regulations, or policies to reflect NFT requirements and must notify customers.

Beginning January 1, 2027: State properties owned or leased by the Department of General Services will no longer be allowed to irrigate NFT with potable water. In addition, all potable irrigation of NFT will be prohibited for local governments, public agencies, public water systems[101], as well as municipal and institutional properties. Revised water systems ordinances and customer communications must be in effect statewide.

Beginning January 1, 2028: All potable irrigation of NFT will be prohibited statewide for all other commercial and industrial properties.

Beginning January 1, 2029: All potable irrigation of NFT will be prohibited for multifamily residential properties, excluding disadvantaged communities. This limitation also applies to common areas of homeowners' associations and similar entities.

June 30, 2030: Commercial, industrial, and institutional property owners with more than 5,000 square feet of irrigated area must begin certifying compliance to the State Water Resources Control Board. Certification is required every three years thereafter (through 2039).

June 30, 2031: Owners of HOA and common-interest development properties with more than 5,000 square feet of irrigated common area must begin certifying compliance. Certification is required every three years thereafter (through 2040).

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[100] Per CWC 10608.12 (l), "disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.
[101] Per CWC §10608.14(a)(5), properties owned by public agencies, local governments, and public water systems located in a disadvantaged community have an implementation date beginning January 1, 2031.

Metering, Volumetric Pricing, and Water Budgets

California Water Code section 525 requires water purveyors to install meters on all new service connections after January 1, 1992. California Water Code Section 527 requires water purveyors to charge for water based upon the actual volume of water delivered if a meter has been installed. It is anticipated that the retail billing system will encourage and help maintain reasonable use (e.g., through implementation of a tiered rate structure and/or water budgets), so that individual customer water demands are reasonably not expected to increase over time.

Anticipated Development

Thoroughly assessing the impact of recently completed or to-be-completed developments throughout the planning horizon is an important part of estimating future customer use. The City anticipates progress on multiple residential, industrial, and commercial developments throughout the UWMP planning horizon, previously presented in **Table 2-5**. The increased demands associated with potential developments are accounted for in the City's forecasted demand, analyzed in Section 4.4.4.

Considering the implications of growth on compliance with the requirements of Senate Bill 606 and Assembly Bill 1668, the City is prioritizing conservation and demand-reduction efforts for new developments, such as installing efficient water systems and low water-use landscaping.

Drought Rebound Considerations

Compared to water use during the 2012 through 2016 drought, recent water demands have demonstrated a lower-than-expected rebound from those low figures. This could be due to the success of the City's conservation programs, or the retention of previously adopted demand reduction behaviors. To account for a continued long-term rebound from this time, a 10% rebound factor applied to future demand projections has been maintained from the 2023 WMP. This approach provides a conservative basis for projecting future water demand, and provides an additional buffer if per capita demand increases in the future for existing customers.

4.4.3. Existing Retail Customer Future Use

To adequately analyze the reliability of water systems and conservatively estimate future use (see Chapter 5), the City is using water use values for 2021 as a representative annual customer demand. As shown in **Table 4-4**, demand for 2021 includes a total annual customer demand of about 83,000 acre-feet, with a production need of just over 91,000 acre-feet when considering system losses.

While these existing customers may undertake a variety of conservation measures – actively through decisions to modify a behavior or a water use, or passively through the purchase of appliances and fixtures that simply use less water – they may also maintain their use as-is. Holding the current use as a constant for all existing customers into the future will provide a conservative number that can be re-evaluated prior to the 2030 UWMP and compliance with forthcoming water use objectives.[102]

4.4.4. New Retail Customer Future Use

The main factor influencing future customer water use is future growth. To blend different methodologies, this section separates future growth based on whether or not developments were previously considered in the City's 2023 WMP, or if they were identified since then. From there, growth anticipated to occur as described in the 2023 WMP is presented, followed by new forecasted demands identified since 2023.

This demand projection methodology incorporates increased demand within the City's current City limits, as well as potential demand outside of City boundaries.

New Development Plans from the 2023 WMP

Previously, the City anticipated future growth to occur in 59 Opportunity Areas. This number has since increased to 62, as discussed further below. For the 59 Opportunity Areas initially identified, however, growth projections were forecasted in terms of dwelling units, jobs, and maximum floor to area ratios. Unit water use factors were then applied to corresponding land use types within the various Opportunity Areas. Residential and non-residential water uses were calculated using total dwelling units per land use type and total jobs per land use type (respectively).

[102] Per California Water Code Section 10609.20, urban water suppliers shall calculate a water use objective composed of, among other factors, aggregated efficient indoor water use based upon standards of no more than 55 gpcd.

Table 4-5 presents the total retail water use projected in the 2023 WMP.[103] Because growth attributed to opportunity area and non-opportunity area new customer growth was not observed in actual water use in 2025, these projections were re-scaled to incorporate the anticipated growth through the planning horizon.

[103] Derived from the City of Sacramento's Water Master Plan Update, January 2023, prepared by West Yost

TABLE 4-5: NEW CUSTOMER FUTURE USE FORECASTED IN 2023 (ACRE-FEET PER YEAR)

		2030	2035	2040	2045	2050
New (Opportunity Area)	Residential	5,141	10,283	15,424	19,280	23,136
	Non-Residential	1,549	3,098	4,647	5,809	6,971
New (Non-Opportunity Area)	Residential	1,459	2,919	4,378	5,473	6,567
	Non-Residential	353	707	1,060	1,325	1,590
Subtotal Potable Water Use		**8,503**	**17,006**	**25,509**	**31,886**	**38,264**

New Development Plans Since the 2023 WMP

Since the preparation of the 2023 WMP, the City has identified additional developments located within the City's Service Area to include within their future retail water use forecast. Forecasted water uses for Stone Beetland, a residential and commercial development, as well as Aspen 1, an industrial development, are shown on **Table** 4-6.[104][105] The City estimates future demands by applying a blanket water use demand factor calculated using recent water use data, and land use data from the Sacramento Area Council of Governments (SACOG), to known project acreages to accommodate for potential land use changes throughout project development and implementation. Also considered in this updated demand table is Cal Expo, who indicated in correspondence with the City that it may become a future retail customer.

TABLE 4-6: NEW CUSTOMER FUTURE USE FORECAST SINCE 2023 (ACRE-FEET PER YEAR)

		2030	2035	2040	2045	2050
New	Stone Beetland	681	681	681	681	681
	Cal Expo	381	381	381	381	381
	Aspen 1	406	406	406	406	406
Subtotal Potable Water Use		**1,468**	**1,468**	**1,468**	**1,468**	**1,468**

New Development Outside City Service Area

So far, demands assessed within this section reflect anticipated growth within the City's service area. Although developments outside of the City's Sphere of Influence (SOI) are not currently anticipated to be served by the City, these areas can be additionally assessed to

[104] The project site is located in south Sacramento and is generally bounded by Cosumnes River Boulevard to the south, Morrison Creek to the east, the extension of 24th Avenue to the west, and adjacent City-owned vacant land to the north, and includes the Morrison Creek Sacramento Regional Transit light rail station.

[105] The Aspen 1-New Brighton project is an approved 232-acre mixed-use development at Jackson Road and Watt Avenue in Sacramento.

evaluate future water and infrastructure needs should the City need to provide water service. Projected water use associated with these developments, calculated using a blanket water use demand factor based on recent water and land use data within the County as well as anticipated acreages of potential development areas is conservatively estimated to be approximately 36,000 acre-feet annually.

4.4.5. Retail Customer Future Use

Section 4.4.3 establishes existing retail customer demand as approximately 85,500 acre-feet annually, including system losses, which is held constant as a conservative planning baseline. Section 4.4.4 adds projected potable demand from anticipated new developments within and adjacent to current City limits. Combined with a 10-percent drought rebound factor applied to the existing baseline, the total retail potable water demand is presented in **Table** 4-7.

TABLE 4-7: OVERALL NEW CUSTOMER FUTURE WATER USE (ACRE-FEET PER YEAR)

	2030	2035	2040	2045	2050
Potable Customer Water Use Subtotal	92,831	101,334	109,837	116,214	122,591
Distribution System Water Loss	9,283	10,133	10,984	11,621	12,259
Drought Rebound Factor	9,115	9,115	9,115	9,115	9,115
Total Potable Water Use - Retail	**111,228**	**120,582**	**129,935**	**136,950**	**143,965**

4.5. Forecasting Wholesale Customer Water Use

The City serves water as both a retailer and a wholesaler. This section forecasts future water demands for wholesale users.

4.5.1. Future Customer Demand Projection Methodology

The City's future wholesale customer demand projection methodology is informed by close regional coordination with local water suppliers, including both existing and potential new wholesale customers, primarily within the American River Place of Use. The City's demand projections for existing customers reflect updated demand forecasts provided by SSWD, SCWA, Cal-Am, and GSWC. For certain service areas and other smaller water suppliers where demands were not provided (for instance, Cal-Am's Arden service area, serving less than 3,000 connections), the City either incorporated demands forecasted in the 2023 WMP or calculated a reasonable estimate using regional demand factors applied at a parcel-level.

4.5.2. Existing and Expected Customer Future Use

Assuming the City maintains existing contracts and commitments as-is throughout the planning horizon, an estimate of the City's water use associated with serving existing and anticipated wholesale customers in five-year increments over the planning horizon (not including drought conditions) is provided in **Table** 4-8. As described in Chapter 2, the City has existing wholesale contracts with several customers and makes deliveries at customer interties.

TABLE 4-8: EXISTING CUSTOMERS - FUTURE WHOLESALE WATER DELIVERIES (ACRE-FEET PER YEAR) [106]

		2030	2035	2040	2045	2050
Cal-Am	Cal-Am Arden	206	206	206	206	206
	Cal-Am Fruitridge Vista (47th and Sampson)	3,630	3,630	3,630	3,630	3,630
	Cal-Am Parkway	1,108	1,108	1,108	1,108	1,108
	Cal-Am Suburban (Folsom)	1,264	1,265	1,266	1,267	1,268
	Cal-Am Rosemont					
SCWA	SCWA International Airport	1,400	1,400	1,400	1,400	1,400
	SCWA Zone 50 Metro Air Park	630	1,111	1,956	3,449	6,076
	SCWA Zone 40	22,921	22,956	22,994	22,994	22,994
SSWD	SSWD Sac Suburban (Northrop)	26,064	26,064	26,064	26,064	26,064
	SSWD Sac Suburban (Arden)					
	SSWD Sac Suburban (Northridge)					
	SSWD Sac Suburban (Del Paso Manor)					
NUSD	Natomas Unified School District	69	69	69	69	69
Totals		**57,292**	**57,809**	**58,693**	**60,187**	**62,815**

4.5.3. Potential Wholesale Customer Future Deliveries

In the future, the City may consider expanding its wholesale services to deliver water to other regional purveyors. As described in the 2023 WMP, other wholesale customers that the City may realistically serve within the planning horizon include water agencies within the American River Place of Use boundary. To provide a conservative estimate, new customer

[106] Demands for most the City's existing wholesale customers are based on recent data provided by Cal-Am, SCWA, and SSWD, reflecting preliminary forecasts prepared for their respective 2025 UWMPs. Demands for Cal-Am Arden, SCWA International Airport, SCWA Zone 40, and NUSD are maintained from the City of Sacramento's Water Master Plan Update (2023), Table 4-8.

future uses reflect a scenario where the City would provide a likely quantity of wholesale water to all of these water agencies through 2040. To comport with current wholesale agency representations, existing wholesale agreements, and infrastructure limitations, future wholesale uses are shown as constant from 2040 through 2050 for certain customers. These assumptions could change and will be reevaluated in subsequent UWMP planning cycles.

Other potential areas that the City could provide water to, located either partially or entirely within the American River POU, include SCWA's Arden Park service area, SCWA's Northgate service area, SSWD's Arden service area, SSWD's new Del Paso Manor service area, Golden State Water Company, Tokay Park Water District, Florin County Water District, and a portion of Carmichael Water District.[107] Although none of these agencies have executed agreements or current delivery arrangements for those additional service areas with the City, potential demands are included in their projections, presented in **Table** 4-9, to assess the City's wholesale capacity, infrastructure, and overall supply reliability.

TABLE 4-9: POTENTIAL FUTURE WHOLESALE CUSTOMER WATER DELIVERIES (ACRE-FEET PER YEAR) [108]

		2030	2035	2040	2045	2050
SCWA	SCWA Arden Park	3,518	3,668	3,768	3,872	3,977
	SCWA Northgate	1,074	1,074	1,074	1,074	1,074
Other	Golden State Water Company	864	861	686	877	889
	Tokay Park Water Company	-	47	95	95	95
	Florin County Water District	-	919	1,837	1,837	1,837
	Carmichael Water District	500	500	500	500	500
Totals		**5,956**	**7,069**	**7,960**	**8,255**	**8,372**

The City has coordinated with various existing wholesale customers located with the American River POU to discuss the potential for expanding conjunctive use, specifically, conducting in-lieu recharge through the Sacramento Regional Water Bank. Utilizing the City's surface water rights under wholesale arrangements to meet future demands in the American River POU would allow the City's regional partners to bank groundwater through in-lieu recharge or aquifer storage and recovery (ASR) during favorable hydrologic conditions.

[107] Demands for the additional SSWD service areas are included in the combined forecast in Table 4-10.
[108] Demands for SCWA and GSWC were provided to the City, aligning with SCWA and GSWC's preliminary forecasts prepared for their respective 2025 UWMPs. Demands for Tokay Park and Florin County Water District are from the City of Sacramento's 2023 WMP, Table 4-8. Demands for Carmichael are estimated based on regional demand factors applied at a parcel level for the American River POU overlap.

Regional coordination is ongoing, and expanding this conjunctive use program is anticipated to benefit regional reliability.

4.5.4. Wholesale Customer Future Use

Existing and new wholesale demands forecasted through the planning horizon are summarized on **Table** 4-10. The City does not anticipate providing recycled water to wholesale customers.

TABLE 4-10: TOTAL POTENTIAL FUTURE WHOLESALE CUSTOMER WATER DELIVERIES (ACRE-FEET PER YEAR)[109]

		2030	2035	2040	2045	2050
Cal-Am	Cal-Am Arden	206	206	206	206	206
	Cal-Am Fruitridge Vista (47th and Sampson)	3,630	3,630	3,630	3,630	3,630
	Cal-Am Parkway	1,108	1,108	1,108	1,108	1,108
	Cal-Am Suburban (Folsom)	1,264	1,265	1,266	1,267	1,268
	Cal-Am Rosemont					
SCWA	SCWA International Airport	1,400	1,400	1,400	1,400	1,400
	SCWA Zone 50 Metro Air Park	630	1,111	1,956	3,449	6,076
	SCWA Zone 40	22,921	22,956	22,994	22,994	22,994
	SCWA Arden Park	3,518	3,668	3,768	3,872	3,977
	SCWA Northgate	1,074	1,074	1,074	1,074	1,074
SSWD	SSWD Sac Suburban (Northrop)	26,064	26,064	26,064	26,064	26,064
	SSWD Sac Suburban (Arden)					
	SSWD Sac Suburban (Northridge)					
	SSWD Sac Suburban (Del Paso Manor)					
NUSD	Natomas Unified School District	69	69	69	69	69
Other	Golden State Water Company	864	861	686	877	889
	Tokay Park	-	47	95	95	95
	Florin County Water District	-	919	1,837	1,837	1,837
	Carmichael	500	500	500	500	500
Totals		**63,248**	**64,878**	**66,653**	**68,442**	**71,187**

[109] For data sources, see footnotes for Tables 4-8 and 4-9

4.6. Projecting Disadvantaged Community Water Use

Pursuant to CWC §10631.1, retail suppliers are required to include projected water use for lower income households. Per California Health and Safety Code §50079.5, a lower income household has an income below 80 percent of area median income, adjusted for family size. For purposes of this UWMP, the number of existing lower income households was derived from the City's 2021 – 2029 Housing Element, indicating about half of the City's households are considered Low, Very-Low or Extremely-Low Income. Assuming that water demand for residential households is equal regardless of income, approximately half of the City's residential water deliveries were made to disadvantaged households.

For purposes of estimating the future water needs, 50% of the total single-family and multi-family connections are presumed to represent disadvantaged households. Applying this condition to the forecast water use for the entire City results in the estimate provided in **Table** 4-11.

TABLE 4-11: ESTIMATED RESIDENTIAL LOW-INCOME WATER USE FORECAST (ACRE-FEET PER YEAR)

	2030	2035	2040	2045	2050
Total Residential Potable Water Use - Retail	64,059	70,660	77,261	82,211	87,162
Low Income Use	32,030	35,330	38,630	41,106	43,581
% of total Potable	50%	50%	50%	50%	50%

4.7. Long-Range Demand Scenarios

The 2025 UWMP Guidebook encourages water suppliers to consider long-range planning horizons that reflect the full lifecycle of water infrastructure and the extended terms of water rights held by the agency. Accordingly, this section presents a set of long-range demand scenarios intended to frame potential conditions that could materially increase the City's water needs through 2100. These scenarios extend beyond the UWMP planning horizon and are intended to support long-term planning and management rather than near-term reliability determinations. The purpose of this analysis is not to produce a precise long-range forecast nor for this document to commit the City to any particular scenario, but instead this analysis is intended to characterize the range of conditions that could influence future water demand and to demonstrate the strategic importance of preserving and exercising the City's full water right portfolio so that the City can meet future water demands.

This assessment identifies six broad categories of demand growth (as well as storage opportunities to support future demand) that could materially increase the City's water needs through 2100: groundwater recharge and water banking, full buildout of the General

Plan and high-density housing/commercial development, annexation and wholesale service in opportunity areas, water-intensive industrial development, environmental flow dedications, and climate-driven demand increases. These scenarios are not mutually exclusive; several are likely to occur in combination over the extended planning horizon.

4.7.1. Groundwater Recharge and Water Banking

The City can recharge groundwater using surface water through in-lieu recharge and is exploring aquifer storage and recovery (ASR) locally and in the region. This represents future demands for the City's surface water supplies as a storage opportunity. The Sacramento Regional Water Bank has the potential to store up to 65,000 acre-feet of water during wet years, with future projects potentially expanding storage to 90,000 acre-feet annually. Beneficially recharging the City's surface water represents an investment in regional water security, providing benefits that could be shared beyond City limits through groundwater exchanges or transfers with other legal users of water, including those experiencing water insecurity.

The region is well-suited to expand in-lieu recharge through the Sacramento Regional Water Bank.[110] Utilizing the City's surface water rights under wholesale arrangements to meet future demands in the American River Place of Use would allow the City's regional partners, including Cal-Am, Golden State, SCWA, SSWD, Carmichael Water District, and RWA, to bank groundwater through in-lieu recharge or aquifer storage and recovery (ASR) during favorable hydrologic conditions. Recharge and meeting demands using the City's surface water represents an investment in regional water security and climate resilience while demonstrating the strategic importance of preserving and exercising the City's full surface water rights portfolio. The City began the process of coordinating with wholesale agencies located within the American River Place of Use to quantify future demands that the City could potentially serve with surface water, reducing demands for supplies that could be recharged or left in the ground.

Groundwater banking and in-lieu recharge would represent long-term storage as a demand category, consistent with DWR's UWMP Guidebook classification and distinct from pass-through or same-year recovery operations. Groundwater banking and storage allows the City to better plan for extended drought and changing climatological conditions.

Protecting groundwater quality is an important component of climate adaptation and watershed resilience, particularly as climate-related stressors can amplify risks such as water

[110] Regional Water Authority, *"How the Water Bank Works,"* Sacramento Regional Water Bank, accessed March 19, 2026, https://sacwaterbank.com/water-bank/how-the-water-bank-works/

quality degradation and groundwater depletion. In recognition that groundwater conditions and water-quality challenges cross jurisdictional boundaries, the City will continue to coordinate regionally through established groundwater and water-planning partnerships, including participation in Sacramento Groundwater Authority and Sacramento Central Groundwater Authority efforts and related regional planning forums that synthesize groundwater management activities consistent with SGMA implementation. In collaboration with neighboring water agencies, the City will pursue bridging solutions that reduce near-term groundwater-quality risk while longer-term watershed and basin sustainability actions are advanced.

4.7.2. Full Build-Out of General Plan and High-Density Housing

The City of Sacramento spans 101 square miles, currently at a density of approximately 5,200 people per square mile. Through 2100, the City would reasonably approach buildout conditions, supporting substantially higher residential density over this timeframe. Following in the footsteps of other medium- to high-density cities in Northern California, Sacramento could potentially support between 6,000 and 18,000 people per square mile, modeled after San Jose and San Francisco (respectively). At an indoor water use rate of 42 gpcd, the City can reasonably anticipate approximately 90,000 AFY of indoor demand at full buildout, with outdoor demands increasing likewise.

In addition to general residential growth, the City has the potential to accommodate high-density housing to support continued population growth in the region. Mid-rise developments typically range from approximately 20–48 units per acre, while high-rise buildings may exceed 100 units per acre. At representative water use rates for multi-unit residential development, demand for individual high-density sites could represent hundreds of acre-feet per year, with total demand scaling substantially across the broader service area as vacant and underutilized lands are developed.[111]

4.7.3. Annexation and Wholesale Service in Opportunity Areas

The 2023 WMP included a sensitivity analysis quantifying demands associated with potential opportunity areas adjacent to the City's boundaries where future growth is anticipated to occur. These areas represent an estimated near-term demand of approximately 35,000 AFY through 2050. Through 2100, continued development in areas outside the City's current limits may rely on the City's municipal water supplies through future annexation or wholesale service agreements. Assuming comparable growth rates to those observed within the City's

[111] Santa Clara County, *Santa Clara County Housing Element and Stanford Community Plan Update, Draft Environmental Impact Report* (June 2023).

vicinity, outside demands could represent an additional 100,000 AFY in future municipal supply obligations through 2100.

The City also has an opportunity to expand its role as a regional water wholesaler by developing new wholesale contracts to serve customers in unincorporated areas falling within the American River Place of Use boundary. For example, SCWA's 2020 Urban Water Management Plan projects total water demands for Zone 40 reaching approximately 80,000 acre-feet per year through 2045, driven by continued residential and commercial growth across the broader Sacramento area. A wholesale agreement structured to supply a portion of SCWA's unincorporated service area could reasonably support up to 40,000 AFY in City deliveries by 2100 as regional growth continues.[112]

Aside from SCWA, other sizeable agencies serving retail demands within the American River POU include Cal-Am Water, Sac Suburban Water District, and Golden State Water Company. If the City were to serve approximately half of those existing retail demands scaled through 2100 through new wholesale contracts, additional future demands on the City's municipal supply could represent hundreds of thousands of acre-feet of water annually.[113,114,115]

4.7.4. Water-Intensive Industries

The City is well-positioned to attract and support a range of water-intensive industries that could substantially increase long-term municipal water demand, given its access to reliable power infrastructure, surface water supplies, as well as proximity to major transportation corridors. These may include:

Data Center Corridor: The City has strong potential to establish a data center corridor, as Artificial Intelligence (AI) hyperscale facilities require reliable access to both power and water infrastructure, both of which the region can provide. Individual data centers can use from 20 to over 600 acre-feet of water per year, with total water demand effectively doubling when accounting for indirect uses such as power generation and

[112] Sacramento County Water Agency, *2020 Urban Water Management Plan* (Sacramento, CA: Sacramento County Water Agency, June 24, 2021)
[113] Golden State Water Company, *2020 Urban Water Management Plan: Cordova System* (San Dimas, CA: Golden State Water Company, August 6, 2021)
[114] Sacramento Suburban Water District, *2020 Urban Water Management Plan* (Sacramento, CA: Sacramento Suburban Water District, 2021)
[115] California American Water, *Sacramento Main District 2020 Urban Water Management Plan* (San Diego, CA: California American Water, July 1, 2021),

semiconductor manufacturing. Depending on the number and scale of facilities, the City could support over 50,000 AFY of water demand for data center operations. [116]

Advanced Manufacturing: The City has the potential to support the reshoring of advanced manufacturing under the federal CHIPS and Science Act by providing the reliable water resources necessary for semiconductor and related high-technology industries. Advanced semiconductor fabrication facilities are water-intensive, commonly requiring over 10,000 acre-feet per year per facility. [117,118]

Green Hydrogen Production: The City has the potential to support green hydrogen production to advance California's net-zero emissions goals. Individual green hydrogen plants can use upwards of 3,000 acre-feet of water per year, and depending on the quantity and scale of facilities developed within the service area.[119]

Nuclear Energy Production: The City has the potential to support nuclear power generation as a reliable, carbon-free energy source if sufficient long-term water supplies are available to meet cooling and operational demands. A representative 1,000-megawatt nuclear facility operating at high capacity could require over 10,000 acre-feet of water per year.[120]

4.7.5. Environmental Flow Dedications

The City could potentially leverage its water rights to voluntarily support in-stream environmental flow dedications beyond its current dedications, consistent with the State Water Board's policy priorities for the Bay-Delta watershed.

Under Water Code Section 1707, the City, as a water rights holder, may petition the Board for a change in purpose of use to preserve or enhance wetlands habitat, fish and wildlife resources, or recreation in or on the water. The City could align dedicated volumes with historical conservation savings, match anticipated future reductions in consumptive use,

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[116] Marie Grimm, Nell Green Nylen, and Michael Kiparsky, Regulating Data Center Water Use in California (Berkeley, CA: Center for Law, Energy & the Environment, UC Berkeley School of Law, February 2026)
[117] U.S. Department of Commerce, National Institute of Standards and Technology, *Final Programmatic Environmental Assessment for Modernization and Expansion of Existing Semiconductor Fabrication Facilities under the CHIPS Incentives Program* (Washington, DC, June 28, 2024).
[118] John Rydzewski, "Managing Water Infrastructure for Semiconductor Fabs: Challenges and Opportunities in the CHIPS Act Era," *Water Technology Online*, December 5, 2024.
[119] Clean Energy Group, *"Green Hydrogen's Impact on Water Supplies,"* September 10, 2024, https://www.cleanegroup.org/wp-content/uploads/Green-Hydrogen-Fact-Sheet.pdf?
[120] Idaho National Laboratory, *LWRS Report: Water–Energy Nexus, Phase 2* (Idaho Falls, ID: Idaho National Laboratory, 2021) https://lwrs.inl.gov/content/uploads/11/2024/03/AnalysisWater-EnergyIssues.pdf

collaborate with the United States Bureau of Reclamation regarding operations at Folsom Reservoir, or implement groundwater substitution to demonstrate that diverted water was made available but not consumed.

Additionally, the City is a signatory in the American River Voluntary Agreement (VA) now referred to as the Healthy Rivers and Landscape Program (HRL), serving its part to help ensure minimum flow requirements are met. The American River VA proposes to add 30, 40, 10, and 10 TAF in critical, dry, below normal, and above normal water years, respectively. Under this structure, the City's flow obligations, in conjunction with regional partners as described in the VA, could reach up to 40 TAF, and if the VA as proposed proves insufficient, additional volumes of 10–20% above proposed levels could be required from American River VA parties, representing up to 48 TAF in total dedicated environmental flows, depending on conditions.[121]

The City also maintains the ARTESIAN agreement as described in Chapter 2 to ensure water is available for environmental releases. Although this agreement primarily relies upon groundwater, RWA Members, including the City, are required to make up to 30,000 acre-feet of water available to the ecosystem during a Call Year, during which a portion of the City's surface water available for diversion under Permits 11358-11361 would not be diverted from the American River, and would remain as Environmental Water. To ensure that this water is available during a call year, the City may characterize this requirement as a demand category in the future in order to fulfill its obligations under the Water Quality Control Plan update, which includes the VA and HRL.

4.7.6. Climate Adaptation and Watershed Resilience

Climate change is expected to increase water demand across multiple end uses while simultaneously reducing the reliability and seasonal timing of surface water availability.

Increased Per Capita Indoor Demand Due to Heat. Research drawing on smart meter data from over 40,000 urban households found that household water usage increases with ambient temperature and accelerates during heatwave events, with climate projection models estimating long-term household water demand increases of 7–44% under moderate to high emissions scenarios through the end of the century.[122]

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[121] Subject to ongoing negiotiation and review. California State Water Resources Control Board, Water Quality Control Plan for the San Francisco, Bay/Sacramento–San Joaquin Delta Watershed (Bay-Delta Plan), December 2025 Revised Draft Sacramento/Delta Updates, December 2025, 69, https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/2025/h/dec2025-rev-draft-sacdelta-bdplan.pdf

[122] Peng Qin, Shuai Chen, Jie-Sheng Tan-Soo, and Xiao-Bing Zhang, "Urban Household Water Usage in Adaptation to Climate Change: Evidence from China," Environmental Science & Policy 136 (2022): 486–496, https://www.sciencedirect.com/science/article/abs/pii/S1462901122002271

Applying this range to the City's projected baseline indoor demand yields an estimated 6,000 to 40,000 AFY of additional climate-driven indoor demand by 2100.

Increased Landscape Demand Due to Elevated ETo. Rising temperatures are projected to significantly increase evapotranspiration demand within the City's service area. Climate projections anticipate a 3–5°F temperature increase by 2070, driving a corresponding 13–18% rise in reference evapotranspiration (ETo).[123] Sacramento falls within CIMIS ETo Zone 14, with a baseline annual ETo of 57 inches; this projected increase translates to approximately 7.4–10.3 additional inches of annual ETo.[124] Approximately 36% of City lands are comprised of tree canopy, grasses, and vegetation that depend on adequate irrigation to sustain the environmental services they provide, including carbon sequestration, stormwater management, air quality improvement, and urban heat island mitigation.[125] Preserving urban green infrastructure will require an estimated 15,000–20,000 additional acre-feet per year.

Decreased Runoff and Diversion Rate Urgency. As examined in the American River Basin Study, climate change will reduce available surface water while simultaneously shifting its seasonal timing. American River runoff could decrease from 3,472 TAF to 3,151 TAF in central tendency models, or as much as 2,840 TAF in hot-dry scenarios, a reduction of nearly 1 MAF of available volume. This has cascading effects on groundwater recharge and environmental applied water demands, and changes in seasonal timing may reduce effective storage at Folsom Reservoir[126]. Under these conditions, the City will need to strategically maximize surface water diversions at full contractual capacity when supplies are available, reinforcing the importance of maintaining its full authorized diversion rates and volumes.

Wildfire and Smoke Events. The City will require robust water supplies to meet future municipal demands associated with increased wildfire and smoke events. Firefighting operations require significant reservoir storage and high-capacity distribution

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[123] Daniel J. McEvoy et al., "Projected Changes in Reference Evapotranspiration in California and Nevada: Implications for Drought and Wildland Fire Danger," *Earth's Future* 8, no. 11 (2020): e2020EF001736

[124] California Irrigation Management Information System, *CIMIS Reference Evapotranspiration Zones* (Sacramento: California Department of Water Resources, n.d.), https://wwwcimis.water.ca.gov/Content/pdf/CimisRefEvapZones.pdf.

[125] City of Sacramento, *Sacramento Urban Tree Canopy Assessment* (Sacramento: City of Sacramento, 2018), https://www.cityofsacramento.gov/content/dam/portal/pw/Maintenance-Services/Urban-Forestry/Urban-Forest-Master-Plan/Copy-of-Sacramento-UTC-Assessment-20180515.pdf.

[126] U.S. Bureau of Reclamation, *American River Basin Study* (Washington, DC: U.S. Department of the Interior, 2021), sec. 3.2.1, "Total Unimpaired Runoff in the Study Area," https://www.usbr.gov/watersmart/bsp/docs/arbs/ARBS-Study.pdf

systems, and dedicated firefighting water facilities may be necessary to serve growing urban areas facing intensifying fire risk.[127] Smoke events elevate indoor water use as populations shelter in place and deploy air filtration, humidification, and cooling systems. Additionally, as illustrated by the Paradise Camp Fire, wildfires can damage distribution infrastructure and contaminate source water supplies, requiring additional supplies to flush, remediate, and restore service.[128,129]

Climate Migration. Climate-driven migration represents a significant potential source of future population growth for the City, corresponding with increased water demand. Historically, regional climate disruption has generated population movement; the 1930s Dust Bowl displaced an estimated 2.5 million people across the Great Plains, with nearly 300,000 ultimately resettling in California alone.[130] A comparable disruption today, such as a sustained regional drought, catastrophic wildfire, or accelerating coastal flooding and seawater intrusion could drive large-scale population movement toward inland cities offering reliable power and freshwater supplies. A climate migration event could reasonably add tens of thousands of new residents to the Sacramento region, significantly increasing municipal water demand.

4.7.7. Conclusion and Water Use Summary

This long-range demand assessment demonstrates that the City's water demands through 2100 could grow significantly from the 25-year baseline projections presented in Section 4.6. The scenarios analyzed here, summarized in **Table** 4-12, are not exhaustive but illustrate how growth, economic development, climate change, and regional leadership opportunities each carry meaningful implications for long-term water supply needs while still managing the water resources responsibly and consistently with regulations and obligations. The table below summarizes the estimated demand ranges associated with each scenario category.

[127] Supporting increases in storage and system capacity would be balanced with other system goals such as maintaining pressures and water quality.
[128] California Environmental Protection Agency et al., *Palisades Fire and Water Supply Analysis* (Sacramento: CalEPA, 2025), https://calepa.ca.gov/wp-content/uploads/2025/11/Final-clean-Palisades-Fire-and-Water-Supply-Analysis.pdf.
[129] PreventionWeb, "Wildfires Can Poison Drinking Water: Here's How Communities Can Be Better Prepared," PreventionWeb, accessed March 2026, https://www.preventionweb.net/news/wildfires-can-poison-drinking-water-heres-how-communities-can-be-better-prepared.
[130] Abraham Parrish, *"Climate Migrants of the 1930s Dust Bowl," Worlds Revealed: Geography & Maps at the Library of Congress* (blog), December 1, 2023, https://blogs.loc.gov/maps/2023/12/climate-migrants-of-the-1930s-dust-bowl/

TABLE 4-12: LONG TERM DEMAND SCENARIO WATER USE

Category	Scenario	Estimated Demand (AFY)
Groundwater Recharge & Water Banking	Sacramento Regional Water Bank	Up to 90,000
General Plan & High-Density Housing	Infill and buildout of vacant lands within City limits	Up to 90,000
	High-density housing	250-750
Annexation & Wholesale Service	Opportunity area annexation	100,000+
	New wholesale service	100,000-250,000
Water-Intensive Industries	Data center corridor	600-50,000
	Advanced semiconductor fabrication	10,000+
	Green hydrogen production	3,000+
	Nuclear power generation	10,000+
Environmental Flow Dedications	American River VA backstop	40,000-48,000
	WC § 1707 in-stream flow dedications	Not readily quantifiable
Climate Adaptation & Watershed Resilience	Increased per capita indoor demand due to heat	6,000-40,000
	Increased landscape/ETo demand	15,000–20,000
	Decreased Runoff and diversion rate urgency	Not readily quantifiable
	Wildfire and smoke event response	Not readily quantifiable
	Climate migration population growth	Not readily quantifiable

While individual scenarios would not manifest simultaneously at their maximum values, their potential for overlap underscores the importance of preserving the City's full water right portfolio to retain operational flexibility through 2100 and beyond.

Chapter 5
Water System Reliability

This chapter provides water system reliability findings as required under Water Code §10635 and provides reliability information that may be used in completing an annual supply and demand assessment pursuant to Water Code §10632.1. The City has reliable water supplies over a 25-year planning horizon in normal, single dry, and five consecutive dry year water supply scenarios.

Assessing water service reliability is one of the fundamental purposes of preparing an UWMP. Water service reliability reflects the City's ability to meet the water needs of its customers, including retail customers and wholesale urban suppliers, with water supplies under varying conditions. The City's UWMP considers the reliability of meeting customer water use by analyzing plausible hydrological, regulatory, and climate variability, as well as other factors impacting the City's water supply and water use. This reliability assessment looks beyond the City's historical capabilities and considers what could be reasonably foreseen in the future.

This chapter synthesizes the details embedded in Chapter 3 (Water Supply) and Chapter 4 (Water Use) and provides a rational basis for future decision-making related to supply management, demand management, and project development. The Five-Year Drought Risk Assessment, Long-Term Service Reliability, and a description of the City's Annual Reliability Assessment procedures are presented in this chapter.

In short, the findings of these risk and reliability assessments are that the City has reliable water supplies available to support both future retail and wholesale demands for its service area through 2050.

5.1. Five Year Drought Risk Assessment

The Drought Risk Assessment (DRA) requires a methodical assessment of water supplies and water uses under an assumed drought period that lasts five consecutive years.

To adequately assess the monthly variability associated with the City's surface water supplies, the City prepared an independent monthly assessment of the water supplies and demands for its system. This assessment also considers system constraints, such as those associated with surface water intake infrastructure, diversion limitations, water treatment

plant operations, water quality concerns, as well as groundwater pumping constraints, which may also influence the near-term management of the City's water asset portfolio.

The City draws from multiple watersheds and groundwater basins, with each source having unique attributes affecting reliability under various hydrological and regulatory conditions, requiring careful consideration. These considerations are further examined in Section 5.3. Nevertheless, the City of Sacramento has organized and coordinated its water portfolio management to ensure water supply reliability in the event of a severe drought, as shown in this DRA.[131] The City's DRA represents a consolidation of its surface water, groundwater, and recycled water supplies into an organized monthly management structure.

Table 5-1 below shows the City of Sacramento's DRA, integrating all of its supplies for 2026 through 2030 as described in Chapter 3 and reflecting the dry year unconstrained retail and wholesale water uses described in Chapter 4. As the table shows the City of Sacramento has sufficient water assets available in all months under its current water management system.

TABLE 5-1: FIVE YEAR DROUGHT RISK ASSESSMENT (ACRE-FEET)

Five Year Drought	2026	2027	2028	2029	2030
Supply	345,354	348,854	370,253	373,753	381,526
Demand	118,457	132,462	146,467	160,471	174,476
Difference	226,897	216,392	223,786	213,282	207,050

5.2. Long Term Service Reliability

The Urban Water Management Planning Act directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2025 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The following subsections describe the long-term water service reliability through a 25-year planning horizon.

5.2.1. Constraints on Water Sources

The City of Sacramento's supply sources are affected by a variety of factors, including physical, legal, environmental, water quality, and climate constraints. These factors and how they impact the reliability of their water supply are discussed below.

[131] The City also actively manages supply under other shortage considerations discussed in Chapter 3.

Consistency with Bond Disclosure

The City's assessment of long-term water supply reliability is consistent with, and informed by, the City's water revenue bond disclosure documents.[132] Reliability statements in this Urban Water Management Plan are intended to align with the City's official bond disclosures and do not introduce new or materially different risks beyond those already disclosed to investors. As reflected in bond offering and continuing disclosure materials, the City has historically managed, and expects to continue managing, hydrologic, regulatory, operational, and water quality challenges through active system operations, capital investment, and adaptive planning.

Physical

Although the City's current supply and distribution system is sufficient to meet existing demands, the hydraulic capacity of supply and distribution system facilities fundamentally affect water supply reliability, both for retail and wholesale customers. The City's 2023 Water Master Plan examines the treatment capacity of the EAFWTP and the SRWTP, briefly summarized below.

The EAFWTP reliably operates at an 80-MGD capacity, limited from its initial 200-MGD capacity due to plant facility conditions as well as environmental agreements limiting diversions during summer months and other times of the year. The reliability of the SRWTP varies seasonally, ranging from a 160 MGD capacity during the summer to 120 MGD for the remainder of the year, although low river levels may reduce the capacity of the plant in the summer months. However, the City is exploring projects to restore EAFWTP and SRWTP facilities to provide a treatment capacity of 120 MGD and 310 MGD, respectively.

The City currently also has permitted wells to supply municipal water. While the City has invested in rehabilitating existing wells, the City's 2017 Groundwater Master Plan and 2023 Groundwater Master Plan Well Replacement Program and EIR also identified locations for future replacement wells.

Legal

As discussed in Chapter 3, under the 1957 Operating Contract, the City accepted contractual limits on its diversion rates and volumes from the American River and Sacramento River permits in exchange for USBR commitments to provide the City with a dependable surface water supply. The Sustainable Groundwater Management Act and resulting Groundwater

[132] City of Sacramento, Official Statement – Water Revenue Bonds (2017);
City of Sacramento, Official Statement – Water Revenue Refunding Bonds (2020); and related continuing disclosure filings made in accordance with the City's Water Revenue Bond continuing disclosure undertakings.

Sustainability Agencies and Plans establish measurable objectives and sustainability criteria for the City and other overlying groundwater users. The Regional Water Authority guides implementation and coordination of groundwater initiatives.

Environmental

The quantity of water diverted from the American River at the EAFWTP is limited by the City's Water Forum Agreement Purveyor Specific Agreement during extremely dry years and times when river flows are below the Hodge Flow Criteria. The City may still divert American River water south of the confluence through the City's existing Sacramento River diversion point during times when EAFWTP diversions are limited.

Water Quality

Water quality is an ongoing consideration for both surface water and groundwater sources and is actively monitored and managed by the City. Regulatory standards, detection methods, source water conditions, and treatment technologies evolve over time, and the City continuously evaluates these changes as they relate to its water system planning and operations. The City's supplies are treated to meet all applicable state and federal drinking water standards.

Consistent with the City's bond disclosure documents, water quality considerations are not expected to impair the City's ability to reliably serve existing or future customers. The City plans for and implements treatment improvements, operational adjustments, and capital projects as needed to address changing water quality conditions and regulatory requirements before such changes would materially affect water supply reliability.

A comprehensive discussion of source water quality conditions, monitoring, regulatory considerations, and management approaches is provided in Chapter 3.

Climate

The reliability of a given water supply system can be influenced by climatic factors generally through seasonal precipitation and runoff. Climate change is altering the fundamental sources of the City's surface water supplies, specifically the precipitation type and amount, runoff patterns, water quality implications, and soil moisture content within watersheds. Warming is a consistent signal across future climate scenarios, directly affecting whether precipitation falls as rain or snow and accelerating snowmelt timing. The City addresses these risks through an intentional focus on climate resiliency and supply redundancy as discussed in Chapter 3.

Previously, the City addressed infrastructure reliability issues brought on by reduced flows on the Sacramento River by installing Vortex protector cages and pump vibration monitoring

technology with early warning systems at both the SRWTP and the EAFWTP in 2015, and conducted water quality evaluations assessing the potential influence of water temperature, lower river flows, and higher mean residence time on the City's source conditions. The City is also updating critical infrastructure through new raw-water intakes, ozone treatment to address changing river water quality, safer disinfection processes, and transmission improvements designed to maintain operational reliability under changing hydrologic conditions.[133]

5.2.2. Long Term Service Reliability

Long-term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2025 through 2050. During base years, the City primarily relies on surface water from the Sacramento River and American River, with some use of groundwater.

Normal and Single Dry Conditions 2030-2050

The City's future water supplies in normal and single dry conditions reflect the same hydrological and regulatory criteria described in previous sections. As described in the 2020 UWMP, the year 1977 is used to represent the Single Dry Year condition for the Sacramento Valley, reflecting the period of lowest water supply availability. Furthermore, the year 2005 represents a Normal Year, reflecting typical conditions when the City's combined water supply sources are available to meet demands.

In Normal Years, supplies are generally constrained only by their express limiting features, for instance, the limitations presented in the USBR Operating Contract. Most notably, the City's base Normal Year reflects the impacts of limited American River diversions at the EAFWTP during Hodge Flow Conditions. During a single dry year, referred to as a Conference Year, diversions from the American River are further limited at the EAFWTP, with a maximum diversion quantity of 50,000 AFY. However, both during Normal and Single Dry years, two of the City's American River entitlements may be diverted downstream at the SRWTP. Hodge Flow Conditions are discussed extensively in Chapter 3. Overall, future water supplies remain relatively constant as average demands grow over time.

As previously discussed, demands during both normal and dry conditions through 2050 tend to reflect typical anticipated uses. Future water demands are generally predicted to increase as land uses and populations grow within and around the City.

[133] Water+ Treatment Plants Resiliency and Improvements Project Final Draft Environmental Impact Report, Chapter 1.2: Summary of Proposed Project

Table 5-2 shows the Normal and Single Dry year supplies and demands on an annual timestep from 2030 through 2050, demonstrating that supplies are sufficient to support both retail and wholesale projected demands.

Supply availability is anticipated to include the Maximum Combined Diversion specified for the year of surface water per the USBR Operating Contract, as well as 35,864 AF of groundwater and 1,000 AF of recycled water. In Single Dry Year conditions, the City's supply availability remains the same with the exception of groundwater, reflecting an increased availability of 47,690 AF. Although not reflected in the City's retail Single Dry Year conditions, the City may implement demand management measures during drier periods to support statewide conditions.

TABLE 5-2: RETAIL NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (ACRE-FEET PER YEAR)

Normal Year	2030	2035	2040	2045	2050
Supply	363,664	363,664	363,664	363,664	363,664
Demand	111,228	120,582	129,935	136,950	143,965
Difference	252,436	243,082	233,729	226,714	219,699
Single Dry Year	**2030**	**2035**	**2040**	**2045**	**2050**
Supply	375,490	375,490	375,490	375,490	375,490
Demand	111,228	120,582	129,935	136,950	143,965
Difference	264,262	254,908	245,555	238,540	231,525

The City's wholesale water supplies are strategically managed to fully meet wholesale demands and are delivered under the City's existing water entitlements. Each wholesale agreement includes provisions that account for differing water year types. More details on projected wholesale water supply are presented in Chapter 4.

TABLE 5-3: WHOLESALE NORMAL AND SINGLE DRY YEAR WATER SUPPLY AND DEMAND THROUGH 2050 (ACRE-FEET PER YEAR)

Normal Year	2030	2035	2040	2045	2050
Supply	63,248	64,878	66,653	68,442	71,187
Demand	63,248	64,878	66,653	68,442	71,187
Difference	0	0	0	0	0
Single Dry Year	**2030**	**2035**	**2040**	**2045**	**2050**
Supply	63,248	64,878	66,653	68,442	71,187
Demand	63,248	64,878	66,653	68,442	71,187
Difference	0	0	0	0	0

Five Consecutive Dry Years 2030-2050

The City defines five consecutive dry years as conditions in which the City is faced with those similar to a low average water supply for five consecutive years occurring historically since 1903. This five-year period is modeled after dry-year conditions experienced between 1929 and 1933, identified as a representative baseline in the 2020 UWMP, and again in this 2025 UWMP.

Demands for five consecutive dry years consider historical trends in water usage during drought conditions by the City's customers, such as increased outdoor irrigation during dry conditions. As droughts persist, however, demands may decline as the realistic constraints on supply availability are realized at the customer level. To conservatively ensure supplies are available to meet projected demands, the fluctuating demand pattern is not reflected in this future reliability assessment. The gradual increase in demands also accounts for reasonable water conservation measures resulting from improved efficiencies in indoor fixtures, management of outdoor landscape irrigation, and a general awareness of the value of long-term water conservation at the consumer level. In addition, the future dry conditions reflect increased land use and populations that would rely upon available supplies.

During these five consecutive dry years, supply availability is anticipated to include the Maximum Combined Diversion specified for the year of surface water, varying quantities of groundwater, as well as 1,000 AF of recycled water produced by Sacramento Area Sewer District, used in lieu of City surface water.

Table 5-4 and **Table** 5-5 below show the City's annual retail and wholesale supply and demand conditions in five consecutive dry years from 2030 through 2050.

TABLE 5-4: RETAIL FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (ACRE-FEET PER YEAR)

		2030	2035	2040	2045	2050
Year 1	Supply	375,490	375,490	375,490	375,490	375,490
	Demand	111,228	120,582	129,935	136,950	143,965
	Difference	264,262	254,908	245,555	238,540	231,525
Year 2	Supply	375,490	375,490	375,490	375,490	375,490
	Demand	111,228	120,582	129,935	136,950	143,965
	Difference	264,262	254,908	245,555	238,540	231,525
Year 3	Supply	409,090	409,090	409,090	409,090	409,090
	Demand	111,228	120,582	129,935	136,950	143,965
	Difference	297,862	288,508	279,155	272,140	265,125
Year 4	Supply	409,090	409,090	409,090	409,090	409,090
	Demand	111,228	120,582	129,935	136,950	143,965
	Difference	297,862	288,508	279,155	272,140	265,125
Year 5	Supply	409,090	409,090	409,090	409,090	409,090
	Demand	111,228	120,582	129,935	136,950	143,965
	Difference	297,862	288,508	279,155	272,140	265,125

TABLE 5-5: WHOLESALE FIVE CONSECUTIVE DRY YEARS WATER SUPPLY AND DEMAND THROUGH 2050 (ACRE-FEET PER YEAR)

		2030	2035	2040	2045	2050
Year 1	Supply	63,248	64,878	66,653	68,442	71,187
	Demand	63,248	64,878	66,653	68,442	71,187
	Difference	0	0	0	0	0
Year 2	Supply	63,248	64,878	66,653	68,442	71,187
	Demand	63,248	64,878	66,653	68,442	71,187
	Difference	0	0	0	0	0
Year 3	Supply	63,248	64,878	66,653	68,442	71,187
	Demand	63,248	64,878	66,653	68,442	71,187
	Difference	0	0	0	0	0
Year 4	Supply	63,248	64,878	66,653	68,442	71,187
	Demand	63,248	64,878	66,653	68,442	71,187
	Difference	0	0	0	0	0
Year 5	Supply	63,248	64,878	66,653	68,442	71,187
	Demand	63,248	64,878	66,653	68,442	71,187
	Difference	0	0	0	0	0

5.3. Annual Reliability Assessment

Each year, the City considers current supply and demand conditions and performs an annual water supply and demand assessment (AWSDA) pursuant to California Water Code §10632.1 to evaluate real time or near-term circumstances that are different than the DRA scenario. This assessment evaluates actual current water supply and use conditions for a prescribed 12-month forecast (July through the following June). Procedures for conducting the Annual Assessment are contained in the City's Water Shortage Contingency Plan. The City has historically conducted the assessment as required by the California Water Code and will continue this planning exercise to provide a reliability assessment for then-current conditions regarding supplies and expected (unconstrained) demands.

5.4. Water Supply Reliability Summary

As presented in Chapters 3 and 4, the City of Sacramento has a diverse and robust water supply portfolio capable of meeting the water demands in its service area in normal, single dry, and five consecutive dry years from 2025 through 2050 with active management of its supply portfolio. The City's diverse water supply portfolio requires coordinated water management to render the supply reliable in all year types through 2050.

Chapter 6
Water Shortage Contingency Plan

A water shortage may occur due to a number of reasons, such as population growth, climate change, drought, and catastrophic events. Drought, regulatory action constraints, and natural and manmade disasters may occur at any time. A water shortage means that the water supply available is insufficient to meet the normally expected customer water use at a given point in time. A WSCP presents how an urban water supplier plans to act in response to an actual water shortage condition. This WSCP describes the City's strategy for allocating water during such water supply shortages, while assuring customers that it will meet the minimum health and safety requirements of a drinking water purveyor.

In 2018, the Legislature enacted two policy bills, SB 606 (Hertzberg) and AB 1668 (Friedman), (2018 Water Conservation Legislation), which set new requirements for water shortage contingency planning. The City has updated its WSCP to meet the new requirements. As required by Water Code Section 10632 this WSCP is incorporated into the UWMP, yet it is also a stand-alone plan that is adopted independently from the UWMP and may be amended or refined and readopted over coming months and years as needed (see subsection 6.9 Plan Adoption, Submittal, and Availability, below).

The City has enacted Chapter 13.04 of the City of Sacramento Municipal Code to address water shortages.[134] These local rules were developed to help manage water shortage conditions in the event of drought, catastrophic outage, or regulatory mandate requiring statewide reduction in water use.

Table 6-1 shows the water shortage actions taken since 2014. Most recently, during the 2020–2022 drought, the City Council adopted Resolution No. 2021-0270 on August 24, 2021, declaring Stage 2 (Water Alert) under the City's Water Shortage Contingency Plan. This action requested a 15 percent voluntary reduction in water use by residents and City operations and aligned the City's drought response with State emergency proclamations and regional actions coordinated through the Regional Water Authority.

[134] Article XI. Outdoor Water Conservation, Chapter 13.04, City of Sacramento Municipal Code.

TABLE 6-1: WATER SHORTAGE RESOLUTIONS AND STAGES, 2014 - 2025

Resolution No.	Adoption Date	Water Shortage Stage	Description / Action
2014-0018	January 14, 2014	Stage 2 – Water Alert	Initial declaration of a City water shortage during the 2012–2016 drought, implementing Stage 2 of the City's Water Shortage Contingency Plan and associated conservation measures.
2014-0209	June 17, 2014	Stage 2 – Continuing Water Shortage	Declared a continuing water shortage and implemented additional water conservation restrictions to achieve a 20 percent or greater reduction in water use, pursuant to Sacramento City Code §13.04.910.
2015 (EO B-29-15 Response)	June 2, 2015	Stage 2 – Continuing Water Shortage	Declared a continuing water shortage and adopted additional conservation measures in response to Governor Brown's Executive Order B-29-15 and State Water Resources Control Board emergency regulations.
2021-0270	August 24, 2021	Stage 2 – Water Alert	Declared Stage 2 Water Alert under the City's WSCP, requested a 15 percent voluntary reduction in water use, and aligned City actions with State drought emergency proclamations and Regional Water Authority resolutions.

The City's updated WSCP is provided in Appendix A and is summarized in this chapter.

6.1. Water Supply Reliability Analysis

Chapters 3 and 5 of the City's 2025 UWMP present the City's water supply sources and reliability, respectively. Findings show that the City will have enough supply with its current water supply sources to meet increased retail and wholesale demands for both a near-term (within the next 5 years) and long-term (within the next 25 years) timeframe.

Statewide water supply conditions, changes in groundwater levels, subsidence, and actions by surrounding agencies may impact the City's available water supply. For the City, a water shortage condition occurs when the supply of potable water available cannot meet ordinary water demands for human consumption, sanitation, fire protection, and other beneficial uses. The City may be able to foresee its water shortage condition in some cases; however, in other cases, the water shortage may be caused by an unforeseen sudden or emergency event. In general, the City's water supply conditions may be affected by the following issues:

- Intake structure issues on the Sacramento or American Rivers,
- Diversion limitations from Sacramento or American Rivers (e.g., regulatory restrictions or reduced flows during drought conditions)
- Reduced surface water availability due to extended drought or critically dry hydrologic conditions

- Operational and/or water quality issues at the City's SRWTP or EAFWTP
- Groundwater well production reduction and/or impacts from water quality issues

Annually, the City determines the expected purchased water and surface water supplies availability for foreseeable water shortages. In other cases, the City may experience unforeseen water shortages when catastrophic interruption of water supplies occurs due to regional power outage, an earthquake, or other potential emergency events.

The City conducts an annual water supply and demand assessment in accordance with its WSCP. The analysis associated with this WSCP was developed in the context of the City's water supply sources and reliability.

6.2. City Water Shortage Contingency Plan

The City's WSCP is included in this UWMP as Appendix A. The City's WSCP is focused on its direct retail customers. The City does not have a separate WSCP specific to its wholesale customers. Each of the City's wholesale customers maintain their own WSCPs which will be reported in their respective UWMPs. The City's Wholesale agreements address the individual availability of wholesale water to each customer based on restrictions to the City's American River water rights.

The City's WSCP describes its strategic plan in preparation for and responses to water shortages. The WSCP includes:

1. A description of the City's teams responsible for internal decision making and implementation of its water shortage stages and associated response actions in the event of a water supply shortage;
2. Procedure for Annual Water Supply and Demand Assessment (AWSDA);
3. Water use reduction plans and stages of implementation;
4. Response actions for emergency conditions;
5. Mandatory water use prohibitions and restrictions;
6. Enforcement and penalties; and,
7. Water use monitoring, enforcement, and compliance.

Below, the City's legal authorities, communication protocols, compliance and enforcement, and monitoring and reporting are presented. Sacramento City Code (SCC) Title 13 Public Services, Chapter 13.04 Water Service System supports the City's WSCP actions.

The City's WSCP has been updated so that it is consistent with the 2018 Water Conservation Legislation requirements.

The City intends for its WSCP to be an adaptive management plan so that it may assess response action effectiveness and adapt to foreseeable and unforeseeable events. It may also be updated to conform to State legislative and regulatory requirements. The City's WSCP is included as Appendix A so that it may be updated outside of the UWMP preparation process.

When an update to the WSCP is proposed, the revised WSCP will undergo the process described in Section 6.9 for adoption by the City Council and distribution to the City, its customers, and the general public.

6.3. Annual Water Supply and Demand Assessment Procedures

The City's Annual Water Supply and Demand Assessment (AWSDA) is to be submitted to the California Department of Water Resources (DWR) by July 1 each year. The Annual Assessment examines the City's anticipated water reliability for the current year and one additional dry year. The Annual Assessment will be prepared at the beginning of each calendar year to evaluate near-term water supply reliability and determine what, if any, water shortage stages may be triggered during the required period. The Annual Assessment will be used by City decision-makers to prepare for and initiate implementation of any needed response actions, as well as to inform customers, the general public, interested parties, and local, regional, and state governmental entities to prepare for such required actions.

In preparing its Annual Assessment, the City compiles all of its data, uses the data to make water use and supply projections, and summarizes these projections into a formal Annual Assessment document. Key data incorporated into the Annual Assessment includes estimates for all water sources on a monthly basis and anticipated customer demand and actual water use on a monthly basis. The City will submit its Annual Assessment to the DWR no later than July 1 each year.

6.4. Six Standard Water Shortage Stages

To provide a consistent regional and statewide approach to conveying the relative severity of water supply shortage conditions, the 2018 Water Conservation Legislation mandates that water suppliers plan for six standard water shortage levels that correspond to progressive ranges of up to 10, 20, 30, 40, 50 percent, and greater than 50 percent shortages from the normal reliability condition. Each shortage condition should correspond to additional actions water suppliers would implement to meet the severity of the impending shortages.

In **Table 6-2**, the City's water shortage stages and corresponding water shortage level conditions are identified. The City's water shortage stages apply to both foreseeable and unforeseeable water supply shortage conditions. Water shortage is the gap between available supply and planned demands.

As described in Appendix A, the City will conduct an AWSDA to determine its water supply condition for the current year and the subsequent year, assuming it is a dry year. The preparation of AWSDA helps the City ascertain the need to declare a water shortage emergency and water shortage stage. In other cases, the City may need to declare a water shortage emergency due to unforeseen water supply interruptions. When the City anticipates or identifies that water supplies may not be adequate to meet the normal water supply needs of its customers, the City Council may determine that a water shortage exists and consider a resolution to declare a water shortage emergency and associated stage. The shortage stage provides direction on shortage response actions.

TABLE 6-2: WATER SHORTAGE CONTINGENCY PLAN LEVELS

Stage	Water Conservation Savings Goal	City Actions Required	Internal/External Customer Actions
Stage 1 (Up to 10%)	Up to 10% reduction in water use	• Restrict/cease internal city irrigation • Preventative maintenance restrictions • Cease non-essential water usage	• Reduce departmental water use
Stage 2 (Up to 20%)	10-20% reduction in water use	• Public information campaign • Water waste patrols • Customer watering restrictions	• Reduce consumption by 10-20% • Comply with watering restrictions
Stage 3 (Up to 30%)	Up to 30% reduction in water use	• Intensify public education • Consider drought surcharge • Further limit watering hours	• Further reduce outdoor watering • Adhere to limited watering hours
Stage 4 (Up to 40%)	Up to 40% reduction in water use	• Vigorous public information campaign • Limit outdoor irrigation to 1 day/week	• Manual application only • 1 day per week outdoor watering
Stage 5 (Up to 50%)	Up to 50% reduction in water use	• Eliminate turf watering • Eliminate median strip watering	• No turf or median watering • Significant water use reduction
Stage 6 (>50%)	Greater than 50% reduction in water use	• Restrict water use to health and safety purposes only	• Water use for health/safety only • Maximum conservation measures

6.5. Shortage Response Actions

CWC §10632 (a)(4) requires shortage response actions that align with the defined shortage levels. The City's shortage response actions consist of a combination of demand reduction,

supply augmentation, and operational changes. The City's suite of response actions are dependent on the event that precipitates a water shortage stage, the time of the year the event occurs, the water supply sources available, and the condition of its water system infrastructure.

The shortage response actions discussed below may be considered as tools that allow the City to respond to water shortage conditions. Because the City may continuously monitor and adjust its response actions to reasonably equate demands with available supply, the extent to which the gap between water supplies and water demand will be reduced by implementation of each action is difficult to quantify and is provided as an estimate. Certain response actions, such as public outreach and enforcement, support the effectiveness of other response actions and do not have a quantifiable effect on their own.

6.5.1. Demand Reduction

During water shortage conditions, the City plans to close the gap between water supply and water demand by implementing demand reduction action categories shown in **Table 6-3**. The shortage stage level for which each demand reduction action will commence implementation is also provided, along with the estimate of extent that the action will reduce the shortage gap. The table also indicates if the City plans to use compliance actions such as penalties, charges, or other enforcement actions for each demand reduction action.

Demand reduction actions are further detailed in Appendix A, Table 2.

TABLE 6-3: WATER SHORTAGE CONTINGENCY PLAN DEMAND REDUCTION ACTIONS (DWR TABLE 8-2)

Shortage Level	Demand Reduction Action	Estimated Reduction	Explanation/Reference	Enforcement (Y/N)
1	Landscape – Other landscape restriction or prohibition	2–10%	Parks/streetscapes reduce irrigation	No
1	Other	0–1%	Preventive maintenance restrictions (less flushing/street sweeping)	No
1	Other	0–1%	Cease non-essential City program water use	No
1	Other	0–1%	Accelerated leak repair to reduce system loss	No
2	Expand public information campaign	10–20%	Initiated at Stage 2	Yes
2	Landscape – Limit irrigation schedule	5–10%	Limit parks/cemeteries irrigation schedule on designated days	Yes
2	Landscape – Limit irrigation to specific days	0–1%	Restrict residential car washing to watering day	Yes

Shortage Level	Demand Reduction Action	Estimated Reduction	Explanation/Reference	Enforcement (Y/N)
2	Increase water waste patrols	0–1%	Patrol expansion	Yes
2	Other	0–1%	Reduce flushing/street sweeping	No
2	Water features – Restrict non-recirculating decorative fountains	0–1%	Shut off non-recirculating ornamental fountains (except habitat)	No
2	Reduce system water loss	0–1%	Enforce hydrant regulations	Yes
2	Reduce system water loss	0–1%	Intensify leak detection & repair	Yes
2	Reduce system water loss	0–5%	AMI leak reports + repair assistance	Yes
3	Expand public information campaign	~10%	Intensified outreach	Yes
3+	Drought rate structure/surcharge	5–30%	Consider drought surcharge	Yes
3	Landscape – Limit irrigation to specific times	8–10%	Parks/cemeteries irrigated only at specific hours	Yes
3	Landscape – Limit irrigation to specific times	0–2%	Residential watering limited to set hours	Yes
3	Decrease line flushing	0–1%	Main flushing for emergencies only	Yes
3	Water features – Restrict fountains	0–1%	Shut off fountains (except habitat)	Yes
3	Reduce system water loss	1–4%	Leak notifications & detection	Yes
3	Other	0–1%	Car washing with buckets only	Yes
3	Other	0–1%	Encourage pool covers	Yes
4	Reduce system water loss	Not specified	Intensify leak detection/water loss program	Yes
4	Increase water waste patrols	Not specified	Expanded staff/patrols (nights, weekends)	Yes
4	Landscape – Limit irrigation to specific times	5–20%	1-day/week watering restriction	Yes
4	Other – Mandatory leak repair	0–1%	Leaks must be fixed within 5 days	Yes
4	Other – Pool/recreation feature restriction	0–1%	Cease all pool/spa maintenance	Yes
4	Other	2–5%	Limit public water use to health/safety only	Yes
4	Other	0–1%	No car washing	Yes
5	Landscape – Prohibit certain irrigation	0–50%	No turf/median irrigation; reduce parks/cemeteries	Yes
5	Other	5–10%	Limit public water use to health/safety only	Yes
6	Other	Not quantifiable	Required health/safety use only	Yes

6.5.2. Additional Mandatory Restrictions

When the City declares a water shortage emergency, it also adopts mandatory water use restrictions by resolution. In addition to the above-presented demand reduction response actions, the City may implement mandatory water restrictions set forth in Appendix J, Section 7. Further, in accordance with SCC §13.04.910, the City will suspend the requirement in its Planning and Development Code to plant or irrigate trees, shrubs, or other groundcover during a declaration of water shortage.

These restrictions are in addition to State-mandated prohibitions.

6.5.3. Supply Augmentation and Other Actions

The City's water supply portfolio consists of surface water from the Sacramento and American Rivers and groundwater from the North American Subbasin and South American Subbasin, as described in Chapter 3 of the City's 2025 UWMP. At any water shortage stage and depending on the water shortage event, the City's water supplies will be used to complement each other and provide resiliency as aligned with the City's Climate Adaptation and Watershed Resilience Plan.

When surface water supplies are reduced or constrained on the Sacramento River, the City plans to use surface water from the American River, and vice versa, providing for resiliency between watersheds consistent with the City's watershed resilience management approach. Should surface become unavailable, the City plans to use its groundwater wells to pump groundwater to meet water demands to meet the health and safety needs of its customers. The City has made, and continues to make, significant investments in the groundwater wells. The City maintains groundwater production capacity from wells in the North American and South American Subbasins that are connected to the potable water system. Permitted groundwater production capacity is approximately 20 MGD, although available day-to-day capacity varies based on factors such as well maintenance, groundwater banking objectives, evolving water quality requirements, and operational policies that guide conjunctive use. The City continues to evaluate and plan for future groundwater system improvements and capacity enhancements through its planning and environmental review processes.

The City may also opt to implement emergency exchanges with other agencies. The City has multiple interties with its wholesale customers. In addition to the wholesale agreements with these agencies, the City has entered into mutual aid agreements with SSWD and SCWA. These mutual aid agreements allow the City to purchase non-firm water supplies during emergency periods. The City may purchase up to 20 MGD of emergency non-firm supply from SSWD, and up to 8 MGD of emergency non-firm supply from SCWA. The City also has

approximately 20 additional unmetered emergency connections to SCWA, Cal-Am Water, SSWD, and Florin County Water Agency. These consist of locked, closed valves on 6- to 12-inch diameter water mains. There is not a current estimate for the capacity of these emergency mutual aid connections, but they are not considered a significant supply source.

Should the City's water supply portfolio be insufficient to meet the reduced demands of its customers, the City may augment its water supply through its emergency interties with other agencies and take other actions as summarized in **Table 6-3**. The shortage stage level for which each action will commence implementation is provided, along with the estimated extent that the action will reduce the shortage gap. Details regarding operational changes in response to water shortage are provided in Appendix A.

TABLE 6-4: SUPPLY AUGMENTATION AND OTHER ACTIONS

Submittal Table 8-2 Wholesale: Supply Augmentation and Other Actions **Water Code Section 10632(a)(4)(A),(C) and (E)**				
	Is the Supplier completing this table using the standard six levels? (yes/no)			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier **Drop down list** These are the only categories that will be accepted by the WUEdata online submittal tool	How much is this going to reduce the shortage gap?		Additional Explanation or Reference (OPTIONAL)
		Volume or Percentage Drop down	Shortage Gap Reduction Value (May be a range)	
Add additional rows as needed				
5	Exchanges	Volume	20 mgd	SSWD - emergency non-firm supply
5	Exchanges	Volume	8 mgd	SCWA - emergency non-firm supply
6	Transfers	Volume	Up to shortage gap	Coordinate with other agencies
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.				
NOTES: Refer to the City's WSCP for more detail on the actions taken at each declared water shortage level. It should be notedthat the actions at each stage are cumulative. For example, if Shortage Level 3 is declared, then the actions at Shortage level 2 and 2 shall still be implemented.				

6.6. Seismic Risk Assessment and Mitigation Plan

CWC §10632.5(a) requires that the UWMP include a seismic risk assessment and mitigation plan to assess the vulnerability of the City's water system and mitigate those vulnerabilities. The City participated in the development of the 2021 Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) led by Sacramento County. The LHMP addressed seismic risk, and is incorporated into this UWMP by reference. The LHMP was adopted by the County on November 16, 2021 and submitted to the Federal Emergency Management Agency, which found it in conformance with Title 44 Code of Federal Regulations Part 201.6 Local Mitigation Plans. The County's LHMP is updated periodically, and reports are provided through the Sacramento County website.

The LHMP considered the risk of the region to earthquakes. The LHMP indicated that no major active faults transect the County, however there are historically active faults in the vicinity of Sacramento County as near as Bethel Island in the Delta, and to the east in the Sierra Nevada foothills.[135] Section F.5.3 of the LHMP provides a discussion of the hazard to the County. A Hazus earthquake analysis was performed on a countywide basis. This can be found in Section 4.3.9 of the LHMP Base Plan. No major earthquakes have been recorded within the County, although ground shaking from earthquakes with epicenters elsewhere have been felt. The Uniform California Earthquake Rupture Forecast (UCERF III) model indicates that Sacramento County has a low to moderate risk of earthquake occurrence, which coincides with the likelihood of future occurrence rating of occasional.

In accordance with America's Water Infrastructure Act (AWIA), the City completed a Risk and Resilience Assessment (RRA) of its water system in September 2020 and updated the RRA in 2025. The RRA systematically evaluated the City's assets, threats, and risks, and evaluated countermeasures that might be implemented to minimize overall risk to the system. Vulnerability to natural hazards, including earthquakes, was assessed based on its level of preparation/resilience, active response capability, and ability to recover. **Table 6.5** summarizes the earthquake risk estimation based on earthquake magnitude from the City's 2025 RRA.

TABLE 6-5: RRA EARTHQUAKE RISK ESTIMATION

Table 7-2. Earthquake Risk Estimation – Supporting Likelihood and Vulnerability Values
Former Seismic Zone 3: Use earthquakes between 6.0 (where significant damage potentially starts) and >7.5 (highest reasonable) magnitude

Earthquake Magnitude	Probability of Exceeding[a]	Recurrence Interval Based on 50 years	Probability of Occurrence (incidents/year)	Vulnerability[b]	Net Threat Likelihood
6	0.4	125	0.008	30%	0.005
6.5	0.15	333	0.003	60%	0.001
7	0.1	500	0.002	80%	0.0018
7.5	0.01	5000	0.0002	100%	0.0002

[a] Online USGS earthquake probability data for Sacramento before discontinuation of Seismic Zone system; consistent with 2014 VA (DOU 2014)

[b] AWWA (2021), Table G-2 (p. 86)

To ensure the security of the City water system, the RRA is retained by the City as a confidential document.

[135] Sacramento County Local Hazard Mitigation Plan Update, September 2021 at Annex F-89-90.

6.7. Legal Authorities

CWC Chapter 3 Division 1, Section 350 requires the following:

…The governing body of a distributor of a public water supply…shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

When a water shortage is determined, the City will coordinate interdepartmentally and with the County for the possible proclamation of a local emergency in accordance with under California Government Code - California Emergency Services Act (Article 2, Section 8558).

In accordance with SCC §13.04.910, the City Council may, by resolution, declare the existence of a water shortage emergency and impose regulations and restrictions to be enforced in response to the shortage.

SCC Chapter 13.04, Article XI (Appendix K) presents the City's legal authorities to enforce shortage actions. Article XI prohibits water waste and provides water use restrictions. It also includes SCC §13.04.890, which outlines enforcement actions for violations to the City's water use restrictions.

6.8. Financial Consequences of WSCP

The UWMPA requires an analysis of the impacts of implementation of this WSCP and likely financial consequences to the City. This section addresses aspects of revenue reduction, expense increases, and additional costs that may arise, and identifies financial response actions.

6.8.1. Revenue and Expenditure Impacts

The City has established water rates that support its on-going operation and maintenance activities, as well as the capital projects required to provide a safe and reliable water supply to its customers. Water rates are tied to the City's customers' normal water consumption activities, with this portion of revenue derived from volumetric (usage-based) charges. While the majority of the City's water utility costs are fixed, a reduction in water demand results in a disproportionate reduction in revenue available to support those fixed costs. Thus, in times of shortage, there will be revenue reductions to the City.

The City estimates the impact to a one-time reduction in water demand in Fiscal Year 2027 under the rates in effect at the writing of this WSCP would be as shown in **Table 6-6**. Actual impacts may vary depending on customer class, service type, and future rate structure.

TABLE 6-6: ONE-TIME DEMAND REDUCTION LOSS OF REVENUE ESTIMATES

Percent Reduction in Demand	Percent Loss of Revenue
10%	3.6%
20%	7.3%
30%	10.9%
40%	14.5%
50%	18.1%

In addition to the revenue reductions, the City will also experience an increase in expenses resulting from augmented communication actions, increased enforcement activities, and the administration of water shortage management actions identified in the WSCP. These costs may include expanded public outreach, customer service demands, compliance monitoring, and potential overtime and reassignment of existing staff.

When a drought or water shortage occurs, the City's costs increase due to the additional activities and duties of instituting a stage of action. Not only will there be costs for materials, and staff time, but the City may need to adjust staffing resources depending on the severity and duration of the shortage event.

To address both increased costs and reduced revenues, the City may implement financial response measures, such as drought surcharges or other temporary rate adjustments, particularly during more severe shortage stages (e.g., Stage 3 or higher). These measures are intended to help maintain the financial stability of the utility by recovering additional operational costs and offsetting revenue shortfalls associated with reduced water use.

Staff will regularly report the identified and anticipated revenue and expenditure impacts and recommend appropriate responses to the City Council.

6.9. WSCP Refinement Procedures

The City's WSCP is an adaptive management plan. It is subject to refinements as needed to ensure that the City's shortage response actions and mitigation strategies are effective and produce the desired results. Based on monitoring described in Appendix A, Section 12, and the frequency of compliance and enforcement actions described in Appendix A, Section 10, the City may adjust its response actions and may modify its WSCP. When a revised WSCP is proposed, the revised WSCP will undergo the process described in Section 6.9 for adoption by the City Council and distribution to the County, its customers, and the general public.

6.9.1. Systematic Monitoring

The City will monitor meters at its water sources to evaluate the overall effectiveness of its response actions in meeting the declared water shortage stage. Should overall demands not meet or exceed the goals of the declared water shortage stage, the intensity of public outreach for water conservation and the extent of enforcement of water use restrictions may be increased. Conversely, should overall demands continue to be substantially less than the goals of the declared water shortage stage, the intensity of public outreach for water conservation and the extent of enforcement of water use restrictions may be decreased.

6.9.2. Feedback from City Staff and Customers

Feedback from City staff and the public is important in refining or incorporating new actions. The City seeks input from staff who interface with customers to gauge the effectiveness of its response actions and for response action ideas.

Customer water meter data may be evaluated for each customer sector or each individual customer. The City tracks water use violations and may evaluate their frequency to determine restrictions that customers may not be able to meet. This evaluation may also show water demand reduction actions that customers may effectively implement.

The City seeks input from its customers and the general public through its website, through public hearings, and through regularly scheduled City Council meetings.

6.10. Special Water Feature Distinction

The City distinguishes special water features, such as decorative fountains and ponds, differently from pools and spas. Special water features are regulated separately. Regulations under SCC §13.04.870 prohibit the use of non-recirculated water in fountains or other decorative fountains.

6.11. Plan Adoption, Submittal, and Availability

This WSCP is adopted concurrently with the City's 2025 UWMP, by separate resolution. Prior to adoption, a duly noticed public hearing was conducted. A hard copy of the WSCP will be submitted to DWR within 30 days of adoption, along with an electronic copy.

No later than 30 days after submittal to DWR, copies of the WSCP will be available at the City's offices. A copy will also be provided to the County. An electronic copy of this 2025 UWMP, including the WSCP, will also be available for the public on the City's website.

Chapter 7
Conservation and Demand Management Measures

The City implements Demand Management Measures ("DMMs") to sustainably manage its water resources. If not mitigated, an increase in water demand and/or changes in water supplies due to climate change and other factors reduce water reliability. The implementation of demand management measures can help improve water service reliability and will help meet City and State water conservation goals.

AB 2067, enacted in 2014, streamlined and updated the reporting requirements for DMMs. This legislation effectively shifted the focus from detailed descriptions of the original fourteen (14) DMMs, otherwise referred to as Best Management Practices, to key water conservation measures implemented to achieve SB X7-7 water use targets. This update resulted in a streamlining of the DMM reporting requirements:

Retail Agencies: reduced DMMs from 14 to 6 *specific measures,* plus an "other" category.

Wholesale Agencies: reduced to three *specific measures*, plus a narrative component for select programs.

The City serves as both a retail and wholesale water supply agency, thus employs a variety of DMMs tailored for the specific needs of its respective systems. This chapter characterizes the City's historical and existing water conservation program, status of DMM implementation, and the City's latest Water Efficiency and Conservation Plan ("WECP").

7.1. Water Conservation Program Overview

The City of Sacramento has implemented a comprehensive, long-standing water conservation program designed to promote efficient water use, reduce potable demand, and strengthen long-term supply reliability. Through its Department of Utilities, the City combined regulatory measures – such as mandatory seasonal watering schedules and water waste enforcement – with financial incentives including rebates for high-efficiency fixtures, turf replacement, smart irrigation equipment, and leak repairs. The City also provides direct customer support through water-use metering tools, and no cost to customer water-efficiency services such as leak investigations or Water Wise House or Business Calls with a

member of its team. Public outreach campaigns and educational workshops further encourage drought-resilient landscaping and responsible water use. Together with regional coordination and long-range planning initiatives, these efforts position Sacramento to meet current demands while preparing for future growth, meeting regulatory requirements, and navigating climatic and hydrological variability.

To comply with California's Water Conservation Act of 2009 (SBX7-7), the City developed a Water Conservation Plan ("WCP") in 2013. The WCP served as a roadmap for the City and outlined implementable water conservation strategies to achieve its 2020 reduction targets while addressing climate change and promoting sustainable water use (discussed in Chapter 5). The implementation of the WCP's conservation measures proved highly successful and resulted in the City surpassing its 2020 per capita water use target of 225 GPCD. The City achieved an actual average per capita water use of 169 GPCD, well below the required conservation target and underscoring the success of the City's comprehensive water conservation program.

Building on its successful legacy water conservation program, Sacramento again partnered with Maddaus Water Management to craft an updated and comprehensive Water Efficiency and Conservation Plan (WECP). The latest WECP performed a scenario analysis of three prospective water conservation programs to determine the optimal water conservation plan for the City. Of the three strategies evaluated, Program B – a moderate, yet strategic expansion of existing conservation efforts – was selected. The details of Program B and its implications are discussed later on (Section 7.6.2).

7.2. Demand Management Measures for Retail Agencies

This sub-section describes the demand management measures ("DMMs") that form the foundation of Sacramento's water conservation program. These six particular DMMs represent adopted ordinances, policies, and long-standing budgeted conservation programs. California Water Code Section 10631 requires urban retail water agencies to provide a description of the following:

- Water Waste Prevention Ordinances
- Metering
- Conservation Pricing
- Public Education and Outreach
- Programs to assess and manage distribution system real loss
- Water conservation program coordination and staffing support

In addition to the six aforementioned DMMs, the City must also describe any other DMMs that it has implemented that have had significant impact on water use.

7.2.1. Water Waste Prevention Ordinances

The City prohibits water waste within its service area. The City first adopted a WSCP in 1992 to minimize non-essential uses of water and conserve remaining supplies to the greatest public benefit. In addition, the City Code (*Title 13 Public Services, Chapter 13.04 Water Service System, and Water Conservation*) defines water waste runoff and associated penalties for violations. The City Code can be amended when the City Council adopts an ordinance. A water conservation ordinance was adopted in December 2009. Over time, the City has amended its water conservation ordinance to meet its urban water use objectives. In 2017, City amended Chapter 13.04 to include water use efficiency requirements for outdoor water use under Outdoor Conservation of Water Ordinance 2017-0045 and, New Landscaping Ordinance 2017-0062 .

The City Council, by resolution, can declare the existence of a water shortage and adopt revised or additional water use prohibitions and consumption reduction methods above and beyond the existing City Code while the water shortage remains in effect. In 2021, following Governor Newsom's State of Emergency Drought Proclamation, Sacramento declared a *Water Alert*, which increased fines for water waste, restricted car washing, and requested voluntary 15% reductions in water use. A *Water Alert* corresponds with Stage 2 of the City's Six Stage Water Shortage Contingency Plan.

7.2.2. Metering

The City's water system is fully metered, and ratepayers are billed based on service size, and their water usage through a volumetric rate structure. California Water Code Section 527 set a hard deadline for retailers to achieve fully metered systems by January 1, 2025. The City achieved this requirement ahead of the statutory requirement. A key feature of the City's Meter Installation Program is its Advanced Metering Infrastructure ("AMI"), which provides real-time water use data to both the City and its ratepayers. This technology empowers ratepayers to make informed decisions about their water usage patterns given the near real-time data available through the Eye on Water Portal, while enabling the City to also proactively identify and notify ratepayers of potential leaks both through letters sent to customers and using the portal software application messaging features. The implementation of the automatic leak notification process and the resulting leak investigations are instrumental in reducing water loss and helping the City to continue to achieve its water efficiency objectives. The City estimates it sends approximately 25,000 leak alert letters per year. About 11% of customer accounts are signed up for the My Water tracking

portal and of those more than 50% have signed up for the leak alert feature. The City is encouraging broader participation to help minimize water waste.

Metered customers are billed for the volumetric amount of water that the customer uses. The City's volumetric rate structure transitioned customers away from flat rates to provide a financial incentive for water conservation.

7.2.3. Conservation Pricing

Historically, the City charged flat rates for water use. To encourage conservation, the City transitioned to a metered, volumetric billing system. Ratepayers typically switched from a flat rate to the new volumetric rate one year after meter installation. Nearly all ratepayers were metered by 2021. Volumetric rates, in effect since 2016, were designed to recover up to 70% of the City's operating costs through water sales. As meter data becomes more comprehensive, the City will reconsider further cost recouping mechanisms. This transition provides a direct financial incentive for ratepayers to use water more efficiently, which is expected to help the City achieve its overall water use objectives. The City periodically conducts rate studies in accordance with Proposition 218 with the next projected study to be completed in early 2027.

7.2.4. Public Education and Outreach

The City implements a comprehensive public education and outreach program to promote efficient water use and support long-term water conservation. Outreach efforts are designed to reach a broad audience of residents and businesses through a mix of digital communications, media campaigns, in-person engagement and customer-focused resources.

The City uses targeted marketing campaigns throughout the year to reinforce seasonal water-use behaviors, including watering schedules and available rebates for water-efficient landscape and irrigation upgrades. The City typically implements two campaigns per year, each representing an investment of approximately $25,000 to $30,000. During the 2020–2022 drought, the City spent a total of $133,000 on four paid media campaigns to encourage customers to reduce water use. Campaigns are delivered through platforms such as social media, streaming audio and video, digital advertising and radio, and are designed to provide clear, actionable steps customers can take to reduce water use.

Educational content is also shared through the City's blog (Sacramento City Express) and Department of Utilities' customer newsletter (City Drop), which provide timely information on topics such as leak detection, irrigation efficiency and available rebates. Customers are encouraged to use the City's online water-use tracking tool (EyeOnWater) at no cost, which allows them to monitor consumption and set alerts for unusual or continuous use that may indicate leaks leveraging the AMI meter-based water data.

The City also conducts direct community outreach by hosting events, including the annual Water Wise Garden Showcase, the City's signature water conservation event, and Mulch Mayhem, an annual giveaway that provides no-cost-to-customer mulch. Along with additional classes, webinars and community events held throughout the year, these efforts provide hands-on guidance on water-wise landscaping, irrigation technology and available rebate programs that help offset the cost of water-efficient upgrades.

In addition, the City incorporates water conservation messaging into utility billing materials, including bill messages and inserts, to reach customers directly and consistently. Supplemental outreach materials, including a 2021 drought awareness flyer and 2022 rebate program flyers in English and Spanish, were also developed to reinforce these messages. These efforts highlight simple actions customers can take, such as adjusting irrigation schedules or taking advantage of rebate programs.

The City also promotes water conservation, education, and public awareness both independently and in coordination with the RWA, a joint powers authority formed in 2001 to promote collaboration on water management and water supply reliability programs in the Greater Sacramento Region. In collaboration with 17 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 $610,000 funded by participating local water suppliers and is supplemented by grant funding. Grants are an important funding resource for the Program. Since 2003, the Program has been awarded $19.9 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, $6.7 million was awarded between 2021 and 2025, and roughly a third went toward funding water efficiency in the City.

The main function of the WEP is to develop and distribute public outreach messages to customers in the region by collaborating with its water supplier 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 Partner of the Year award in 2021 along with three Public Relations Society of America (PRSA), California Capital Chapter awards in 2023/2024 for WEP's public outreach and school education programs. From 2021-2025, the WEP created a series of public outreach campaigns. Below is a narrative of each RWA campaign between 2021 and 2025 and highlighted achievements.

2021 was a year for nimble messaging and maximum flexibility to adapt outreach to the rapidly changing conditions. RWA's Regional Water Efficiency Program (RWEP) began 2021 with a focus on household leaks and then transitioned to the fourth year of an award-winning outreach campaign focused on tackling the landscape overwatering problem by encouraging residents to check soil moisture before turning on sprinklers (Check & Save). With the sudden emergence of drought in May 2021, the program introduced new creative and tools for RWEP participants. The goals being to help provide consistent and actionable tips region-wide while providing flexibility for RWA members to customize materials to reflect their unique water supply situation and call to action.

As the drought grew more serious through late 2021 and into 2022, the WEP updated messaging again and ramped up outreach, asking residents to reduce lawn watering while continuing to water trees (Stress Your Lawn, Save Your Trees), understanding that lawns can handle less water but that drought-stressed trees can be lost forever. This messaging supported the Governor's request of water suppliers to voluntarily reduce water use by 15 percent. Additionally, the WEP continued to partner with the Sacramento Tree Foundation to help educate residents and businesses on how to maintain and expand the region's healthy tree canopy and included a series of co-branded educational videos and materials.

After the drought subsided in 2023, the WEP launched a new multi-year outreach program aimed at encouraging water efficiency during a non-drought year. Research indicates that public engagement in water conservation tends to surge during drought periods, such as 2022, but declines during non-drought years, like 2023. Consequently, garnering attention and motivating action becomes more challenging during non-drought periods. To tackle this challenge, the 2023 outreach program focused on two main messages:

SUMMER STRONG — focused on promoting water-wise best practices outdoors. A Summer Strong yard is tough enough to muscle through the Sacramento region's hottest days and still look its best. The campaign featured eye-catching graphics to promote efficient tree watering, adding low-water and native plants, checking soil moisture, using weather-based sprinkler timers, and watering early to minimize evaporation.

SUDS WOULD BE DUDS WITHOUT H2O—With clean, reliable water essential to great beer (and to the success of local breweries), the WEP launched a pilot project to partner with local craft brewers, aiming to educate patrons about the importance of water to beer and how to preserve this natural resource. Initial partners included Jack Rabbit Brewing Company and Red Bus Brewing Company, which committed to distributing Be Water Smart materials to their customers. This campaign featured the development of a rebate program to upgrade brewing equipment to be more water

efficient and the distribution of coasters, koozies and stickers with water savings messages.

In 2024, the WEP enhanced its existing Summer Strong campaign with the Summer Strong Yard Champs promotion, spotlighting Sacramento-area residents who transformed their landscapes into water-efficient yards. Homeowners nominated yards featuring low-water plants and efficient irrigation systems for a chance to be featured on regional billboards. Nearly 50 nominations were reviewed, with winners receiving professional photoshoots. Featured yards included a mix of DIY and professionally designed landscapes, all showcasing water-saving practices like low-water and native plants, drip irrigation, and rainwater capture, inspiring others to adopt similar approaches.

In 2025, the Summer Strong campaign added a new mascot, Jack LaPlant, an animated plant figure that carried on all the same water savings tips but with refreshed visuals to draw in a new audience. In 2024, the WEP expanded its successful pilot project, Suds Would be Duds without H2O, with local craft breweries to raise awareness about water's role in craft beer production and to promote water efficiency. The campaign visited 52 breweries across the Sacramento region. Around 20 breweries are considered active partners, including six of the top craft breweries in the area. Promotional materials, including 10,500 coasters and 7,200 stickers, were distributed by these partners and included water-saving tips and a link to our BeWaterSmart.Info website to access rebates. Additionally, two breweries, Urban Roots Brewery & Smokehouse (within the City limits) and Solid Ground Brewing participated in WEP's commercial indoor rebate program. Each brewery received $15,000 to upgrade or add equipment that reduced water used for chilling and sanitizing processes.

Both campaigns, Summer Strong and Suds Would be Duds without H2O, were continued through the end of 2025 and were implemented through both paid advertising buys and earned media from public service announcements (PSAs) and aired in English and Spanish. Every year the campaigns' messaging can be heard on local radio stations such as Capital Public Radio and online through Google, Facebook and YouTube advertisements. For clarification below, impressions represent how many times an ad was seen.

From 2021-2025, the WEP public outreach campaigns produced significant engagement throughout the Sacramento Region:

- Television Advertising: 3,926 television advertisements; 23,212,700 impressions
- Streaming Video Advertising (Comcast, EyeQ, Hearst, Paramount Plus, & Premion): 3,532,621 advertisements; 3,532,621 impressions
- Radio Advertising: 5,273 radio advertisements; 19,994,200 impressions

- Digital Advertising (Facebook, Google Display Network & Spotify): 29,472,602 impressions; 297,870 clicks
- Billboard advertising: 2,037,102 digital advertisements; 62,807,653 impressions
- Public Service Announcements (Television and Radio): 24,248,000 impressions; $683,400 in value had they been purchased as advertising
- Facebook: 60 posts per year

The Program continues to utilize the WEP public outreach website, BeWaterSmart.Info, and the "Be Water Smart" brand to reach customers throughout the region. The website contains customer-specific (enter your address) local water supplier information on rebates and services, general top ways to save for residents and businesses, an interactive watering guidelines and water waste reporting tool, a water-wise plant and gardening database, recent press releases, the Sacramento Smart Irrigation Scheduler tool, and more. Between 2021 and 2025, the website averaged 37,000 unique visitors per year.

For more targeted outreach, the Program distributed quarterly e-newsletters to enrolled residents. The e-newsletters are filled with water savings tips, upcoming events and region-specific articles. They are usually timed around changes in the weather to help signal the need for residents to adjust their irrigation systems, such as daylight savings coupled with a message to dial back/reduce sprinkler systems run times. The e-newsletter reaches 9,361 households.

The WEP selects 2 public events each year to attend as an opportunity for the public to interact with local water efficiency staff. This provides an opportunity for the region to communicate its messages in person. From 2023-2024, WEP attended ECOS Earth Day (April) and the Farm-to-Fork Festival (September).[136] In 2025, the WEP opted to attend the Sacramento Republic Brew Festival (June) instead of the Farm-to-Fork Festival to elevate our existing partnership with Sacramento Republic FC. At these events, the Be Water Smart team provided water-wise tips, encouraged visitors to sign the pledge banner, collected e-mails for those who wish to sign up for the e-newsletter list, as well as identified a customer's water supplier and connected them with rebates and services. Additionally, WEP, in coordination with participating local water suppliers, including the City, hosts an annual Mulch Mayhem event in which customers can pick up a truck load of no-cost mulch from selected locations throughout the region. Combined, these in person events are attended by thousands of people each year throughout the region.

[136] No public events were attended in 2021 and 2022 due to the COVID pandemic.

The Program provides a variety of "give-a-way" items to customers at in person public events and through direct mail requests from the BeWaterSmart.Info website. From 2021-2025, WEP has distributed thousands of leak detection tablets, moisture meters, garden gloves and drink koozies to customers to encourage the water savings practices described in our public outreach campaigns and brewery partnerships.

The Program is also very active in communicating to local media outlets. Between 2021 and 2025, RWA issued 23 press releases on WEP activities and regionally significant news and participated in 17 radio public affairs interviews airing on 18 stations across the Sacramento region's major commercial radio networks. 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.

Finally, the WEP partners with professional sports teams in the region to expand the Be Water Smart advertising to new and captive audiences. WEP partnered with the Sacramento River Cats (local Triple – A affiliate of the San Francisco Giants) in 2021, which included our long standing water savings advertisements on all bathroom stall doors as well as 30-second Check & Save spots broadcast on KMAX Channel 31 during each Saturday game and multiple 30-second radio spots broadcast during every game via their streaming radio coverage. The total attendance for regular season games was 342,861. In addition, 24 special events at Sutter Health Park drew 66,300 people in 2021. In 2023, RWEP launched a new partnership with Sacramento Republic FC (local USL professional soccer team), displaying water-wise messages at games to promote "Summer Strong" yards. The partnership continued through 2025 and included the following activities: a 30-second LED ad, messaging on water refill stations, and giveaways booths at events/games.

To support public outreach messaging and promote water savings tips, the Program also coordinated several regional rebate programs, which were partially or fully funded by state, federal and private foundation grants. A variety of high efficiency rebate options were provided including toilets, clothes washers and irrigation efficiencies (full summary in Table 7-1). Additionally, from August 2023 - November 2025, RWA managed a regional direct installation program, in which a contractor was hired to replace old high use fixtures in multifamily and commercial/institutional properties in disadvantaged communities in the region. Collectively, these rebates and direct installations will produce an estimated lifetime (10 years) savings of 7.4 billion gallons of water and 7.9 million kilowatt hours of energy.

TABLE 7-1: REGIONAL REBATES AND INSTALLATIONS FROM 2021 – 2025[137]

Rebate/Installation Type	2021	2022	2023	2024	2025	Lifetime Water Savings 2021-2025 (MG)	Lifetime Energy Savings 2021-2025 (kWH)**
High Efficiency Clothes Washer Rebates	359	265	307	321	298	74.7	79,309
High Efficiency Toilet Rebates	767	1,275	602	423	326	137.5	145,990
Smart Irrigation Controller Rebates	686	1,049	3,051	556	464	1,190.2	1,264,024
Irrigation Efficiencies Rebates*	5,941	7,153	13,327	11,160	10,321	5,269.2	5,595,912
Turf Replacement Rebates (square feet)	153,880	239,645	135,607	300,152	266,840	405.6	430,711
Toilet Direct Installation	NA	NA	584	2,183	1,688	141.9	150,671
Showerhead Direct Installation	NA	NA	562	1,766	1,532	197.2	209,475
Faucet Aerators Direct Installation	NA	NA	884	3,215	2,343	20.6	21,850
Urinal Direct Installation	NA	NA	-	19	40	1.3	1,348
Total Water Savings (MG)						**7,438.1**	
Total Energy Savings (kWh)**							**7,899,291**

*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-hour
MG = million gallons
NA = no funding available
Lifetime = 10 years

In addition to public outreach, the Program also coordinates regional school education activities. The RWA-sponsored water efficiency exhibits ($500,000 sponsorship) opened for viewing in 2021 at the new SMUD Museum of Science and Curiosity (MOSAC) in downtown Sacramento, reflecting years of input by RWA Water Efficiency Program Manager, Amy Talbot, who helped shape the exhibits. The exhibits teach visitors to become a "Home Water Detective," create their own mix tape from water conserving sounds in "Drop a Beat" and learn about local "Water Champions." MOSAC currently welcomes around 150,000 visitors a year from all over the region.

Since 2012[138], 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 teachers and students with relevant facts and images to help them develop 30 second video Public Service Announcements (PSAs). The contest themes for 2022 and 2023

[137] For City of Sacramento-specific activity, see Appendix A - Water Efficiency and Conservation Plan, Chapter 4.
[138] The program did not host a Water Spots Video Contest in 2021 due to the COVID pandemic.

were "When in Drought…take action to reduce water use" and "Do Your Part to Be Water Smart," respectively. Students submit their videos to WEP 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 students receive cash prizes and the winning videos are played at Sutter Health Park during River Cats games and in select movie theaters throughout the region (Example: Century Blue Oaks theatre in Rocklin and Century Laguna 16 in Elk Grove). The winning PSAs are incorporated into the WEP's media activities as well. The 2022 Grand Prize winner video "Doing Your Part" appeared 2,619 times in theatres and delivered 49,000 impressions. The 2023 Grand Prize winner video "Saving Water" appeared 2,149 times in theatres and delivered 47,000 impressions. Students from about a dozen area schools submitted a total of 54 videos for the 2022 and 2023 contests.

In late 2023, WEP sunset the Water Spots Video Contest and launched a new school education program, Drip Drop, Hip Hop, in collaboration with NorCal School of the Arts (NorCal Arts), which brings together the worlds of art and sustainability to empower children, families, and communities in the Sacramento region. Funded by a $300,000 grant from the Capital Region Creative Corps and California Arts Council, Drip Drop, Hip Hop educates students and families about water efficiency through a two-person play and arts-integrated lesson plan. The program is no-cost-to-customer for primarily Title I schools and community venues in Sacramento, Placer, and El Dorado counties plus the City of West Sacramento. The children receive a shower timer with water-efficiency tips with each classroom visit. Additionally, in 2024 the program developed a 30-second television and radio Public Service Announcement (PSA) showcasing local children spreading the water efficiency message to a broader audience in both English and Spanish. In 2024, the PSA was broadcast 1,205 times in 7 television outlets for a total of 5.6 million impressions for an added value of $124,250 and 567 times in 17 radio outlets for a total of 1.2 million impressions and an added value of $45,290. As of the end of 2025, the Drip Drop Hip Hop reached 13,232 students through 509 classroom performances and additional community events in Sacramento, Placer and El Dorado counties. Teachers reported increased water conservation knowledge and that students shared the information with their families.

Additionally, the City's outreach efforts related to water use efficiency and water conservation have received awards from the EPA Water Sense Program, most recently in 2024 for educating its residents on water efficiency. Public outreach also remains a critical part of the City's water conservation program. These strategies include school education programs, e-newsletters, and active communicating in local media outlets.

7.2.5. Assessing and Managing Distribution System Real Loss

The City actively manages water loss through a comprehensive system audit and leak detection program. This process quantifies "unaccounted-for-water" - the difference between water produced and consumed – which becomes more precise as the meter network expands. The program relies on both visual and audible inspections to locate leaks. Visual checks of system components like fire hydrants and valves identify obvious issues, while specialized electronic listening equipment is used to pinpoint the exact location of hidden leaks.

In line with this effort, the City performs annual water audits following the AWWA Method 36 and has made significant progress in reducing water loss by rehabilitating, repairing, and replacing aging infrastructure. This ongoing leak management program is a vital part of the City's Water Conservation and Sustainability Plan, as it allows for quick repairs to minimize water loss. The City is also adhering to State water loss targets described in Chapter 4.

7.2.6. Water Conservation Program Coordination and Staffing Support

A Water Conservation Coordinator leads a designated staff (four water conservation specialists, one customer service representative, three water conservation representatives, one office administrator, and 1-2 interns) to actively develop, promote, enforce, and maintain water conservation programs.

7.3. Other Demand Measures

As previously discussed, AMI data supports water demand management by providing near real-time water use information that allows the City and its customers to closely track usage, identify leaks, and reduce water waste in a timely manner. It also supports behavioral water conservation by enabling targeted outreach and informed customer decision-making regarding water use efficiency.

In addition to the six aforementioned DMMs, the City also offers the following programs that provide integrated services and incentives for water conservation to City customers:

- Residential Water Wise Rebates
- Residential Water Services
- Business Water Wise Rebates
- Business Water Wise Services
- Water Wise Tools

7.3.1. Residential Conservation Programs

The City provides Water Wise rebates and services to its residential customers and promotes such services on its water conservation website. Implementation of Water Wise rebates and services is expected to reduce the amount of water consumed by its residential customers and help the City achieve its water use objectives.

Rebate Programs

Table 7-2 briefly summarizes and describes the rebate programs available to residential customers. The rebate programs are available to property owners, their tenants, commercial, industrial, institutional, and multi-family customers. All rebates are subject to review by water conservation staff and the terms and conditions outlined on the City's water conservation website: sacwaterwise.com. Some rebates may be combined with rebates from the Sacramento Municipal utility District (SMUD). Detailed information on these rebate programs and metrics can be found in the WECP in Appendix __.

TABLE 7-2: CITY OF SACRAMENTO REBATE PROGRAMS AND SERVICES THROUGH 12/31/25

Program Category	Rebate/Service Program	Description
Indoor	No-cost-to-customer Discounted Showerheads	Provides no-cost-to-customer or discounted high-efficiency showerheads to help reduce indoor water use.
Indoor	High Efficiency Toilets	Rebate of up to $125 for replacing pre-1992 toilets with high-efficiency models.
Indoor	High Efficiency Clothes Washers	Rebate of up to $125 for clothes washers with a water factor of 3.7 or lower.
Indoor	AMI Leak Alerts, "Leak Free Sacramento", Leak Repair Assistance and Rebates	Programs that notify customers of potential leaks and provide assistance or rebates for repairs to reduce water loss.
Indoor	No-cost-to-customer Water Wise House Calls	No-cost consultations targeting customers using more than 55 gallons per person per day indoors or more than 500 gallons per day outdoors during summer to identify water savings opportunities.
Outdoor	Turfgrass Conversion	Rebate of up to $3,000 for converting turf to water-efficient landscaping, calculated at $1.50 per square foot; labor may be included.
Outdoor	Irrigation Upgrades	Rebate of up to $400 for improvements to irrigation systems to increase efficiency; labor may be included.
Outdoor	Smart Irrigation Controllers	Rebate of up to $400 for installation of weather-based or smart irrigation controllers; labor may be included.
Outdoor	Rain Barrels	Rebate of up to $150 for rain barrels, calculated at $0.75 per gallon of storage capacity.
Outdoor	Laundry-to-Landscape	Rebate of up to $100 for materials used to redirect laundry water for landscape irrigation.

Residential Water Wise Services

The City offers a no-cost-to-customer residential water survey service known as the Water Wise House Call Program. Surveys are conducted by trained water conservation specialists who visit residences and review landscape and irrigation conditions in addition to evaluating indoor water use. After completing the review, the specialist informs the resident of flagged inefficiencies and provides information on how to improve overall water use efficiency. To schedule a Water Wise House Call, customers can call the City's conservation hotline.

This complimentary service aims to educate customers on the benefits of water efficiency while also lowering utility bills and promoting conservation.

7.3.2. Commercial Water Wise Business Calls

Similar to Water Wise House Calls for residential customers, the City offers Water Wise Business Calls for commercial customers. Site visits are conducted by trained water conservation specialists at no cost to the business. The water conservation specialists help identify potential water-savings for the business and identify rebates for which the business may be eligible. Businesses can call the City's conservation hotline (916-264-5011 or 311 from within the City) to schedule their site visit.

7.4. Demand Measures for Wholesale Agencies

California Water Code Section 10608.12 requires urban wholesale water suppliers to provide narrative descriptions of implemented DMMs. Wholesale agency DMMs focus on regional water efficiency, infrastructure management, and supporting retail agencies with an emphasis on long-term supply reliability. Such DMMs implemented by the City's wholesale system include:

- Metering
- Public education and outreach
- Water conservation program coordination and staffing support

Additionally, a narrative of the City's wholesale system's asset management and wholesale supplier assistance programs are required as well. For each DMM, the City's current program is described, followed by a description of the respective DMM and how it was implemented between 2021 and 2025.

7.4.1. Metering

The City's wholesale interties and water deliveries with other agencies are fully metered, and meter calibration is verified on an annual basis.[139] All facilities are fully equipped with SCADA and security alarms, and are maintained by City mechanical, electrical, and instrumentation staff. Maintenance is performed as warranted with the receiving wholesale customer.

7.4.2. Public Education and Outreach

The City actively participates in the Regional Water Authority's Water Efficiency Program Public Information Campaign. Of the RWA's 21 members, three are wholesale customers of Sacramento. Public education and outreach materials, prepared by the City, are available to its wholesale customers through the City's website. A full description of the City's participation in the RWA's public education and outreach initiatives is discussed in *Section 7.2.4*.

7.4.3. Water Conservation Program Coordination and Staff Support

Water Conservation Program Coordination and Staff Support for the wholesale system are conducted by the same staff that serves the retail system. The retail system's water conservation program and coordination and staff support is described in *Section 7.2.6*.

7.4.4. Asset Management

The City is addressing the challenges of an aging water system by implementing a proactive asset management program to guide its capital improvements. As critical infrastructure—including pipelines, reservoirs, and treatment plants—approaches or exceeds its design life, the need for systematic rehabilitation or replacement has become a high priority.

To ensure long-term infrastructure sustainability and a reliable water supply, the City's asset management strategy prioritizes rehabilitation and replacement projects based on a clear framework. This framework incorporates best practices such as long-range planning, life-cycle cost analysis, proactive operations and maintenance, and sustainable funding strategies for capital replacement. This strategic approach ensures that investments are made effectively to maintain system integrity and service quality.

7.4.5. Wholesale Supplier Assistance Programs

The City provides conservation assistance to its wholesale customers via participation in the RWA Water Efficiency Program Advisory Committee. The Committee meets monthly and the

[139] Emergency interties with other agencies are not fully metered.

City actively participates. Through this meeting, the Committee members provide water conservation program updates and coordinate on activities.

7.5. Urban Water Use Objectives

Urban Water Use Objectives (UWUO) are a critical tool in aligning the City's existing and future water use with California's conservation goals. These regulations, known as "Making Water Conservation a California Way of Life," shift the state from a one-size-fits-all approach to a more customizable framework based on the unique characteristics of each retailer's service area. UWUOs are effectively a water budget, where retailers must calculate their UWUO for the previous year and compare it to their actual water use. The UWUO is the summation of four efficiency budgets: (1) Indoor Residential; (2) Outdoor Residential; (3) Commercial, Industrial, and Institutional (CII) Landscapes; and (4) Water Loss. As a whole, retailers are granted flexibility and required only to meet the total, or aggregate, UWUO. While regulations are currently in effect, compliance has been deferred until 2027.

The UWUO must fall below the City's SB X7-7 target, otherwise the UWUO is capped at the SB X7-7 target. Sacramento currently is well below its SB X7-7 target (see Chapter 4).

Through implementation of permanent water waste ordinances, targeted indoor and outdoor conservation programs, advanced metering analytics, CII performance measures, and proactive water loss management, the City of Sacramento is currently meeting and is well positioned to continue meeting its Urban Water Use Objective targets as required under California's *Making Water Conservation a California Way of Life* regulation. The City's UWUO reports are available for review on the Department of Water Resources Water Use Efficiency Data (WUEdata) portal.[140]

Residential Indoor Water Use Standard

The Residential Indoor Water Use component of the UWUO is calculated by multiplying the applicable gallons-per-capita-per-day ("GPCD") consumption standard by the City's service area population and by the number of days in the year. The GPCD standards utilized to calculate the Residential Indoor Water Use decrease over time, starting at 47 GPCD in 2025 and decreasing to 42 GPCD by 2030.

Residential Outdoor Water Use Standard

The City's Residential Outdoor Water Use Standard is calculated by multiplying the landscape efficiency factor ("LEF") by net evapotranspiration ("Net ETo") by the square footage of

[140] https://wuedata.water.ca.gov/

residential irrigable irrigated landscape area, and by a conversion factor of 0.62 that converts acre-inches per year to gallons per square foot per year.

Additionally, the City may include budgets for temporary provisions for residential outdoor use for planting of new trees and establishing qualifying landscapes. This temporarily increases the Residential Outdoor Water Use Standard for the year. This temporary action will require supporting information and needs to be submitted and approved by DWR.

Commercial Outdoor Water Use Standard

Like the Residential Outdoor Water Use Standard, the Commercial Outdoor Water Use Standard also utilizes landscape area measurements by the LEF, Net ETo, and conversion factor (0.62) when calculated.

Compliance with the Commercial Outdoor Water Use Standard is deferred until July 2028. Upon which, the City will calculate for accounts with dedicated irrigation meters ("DIMs"). Prior to this compliance deadline, suppliers' Commercial, Industrial, and Institutional Dedicated Irrigation Meters ("CII-DIM") water budgets will equate to the actual deliveries reported to SWRCB. Importantly, there is significant uncertainty in estimating future UWUOs prior to the release of CII-DIM landscape area measurements as this data accounts for a substantial component of the UWUO.

CII Mixed Use Meter Large Landscape Compliance

An additional water budget requirement is the conversion of large landscapes with mixed use meters ("MUMs"). MUMs are commercial, institutional, or industrial meters that record both indoor and outdoor water usage. Water budgets for large landscapes are to be calculated by multiplying the landscape area by net evapotranspiration by 0.63 and by a unit conversion factor of 0.62.

Water Loss Standard

The California Water Code §10608.34 required the State Water Resources Control Board (SWRCB) to develop water loss control and performance standards (Real Water Loss Standards) applicable to urban retail water suppliers. The resulting Real Water Loss Standard is 41.1 gallons per (active and inactive) service connection per day. More information on the Water Loss Standard can be found in Chapter 4 of this UWMP.

Bonus Incentive

A bonus incentive is available to suppliers that deliver potable reuse water produced at an existing facility. This incentive applies to the supplier's UWUO and increases the UWUO budget for that year by up to 15%. The bonus incentive is calculated as the total volume of potable water delivered to residential accounts and CII landscapes with DIMs as a percentage of all potable water deliveries multiplied by the supplier's individual potable reuse.

At this time, the City neither produces nor utilizes potable reuse water as part of its water supply portfolio. The bonus incentive is not applicable towards the City's UWUO.

7.6. Water Efficiency and Conservation Plan

The City engaged Maddaus Water Management to conduct an updated *Water Efficiency and Conservation Plan* in late 2024 and finalized the plan in April 2026. The WECP builds on the success of the original 2013 Water Conservation Plan and is designed to ensure compliance with the latest urban water use efficiency frameworks.[141] As part of its update to the City's water conservation program, the WECP offered three water conservation program scenarios to provide the City with options on how best to advance its water conservation objectives. Program A served as a baseline, with no change, the status quo. Program B outlined modest, yet strategic additions to the City's water conservation program while Program C was the most ambitious and consequently most expensive option. The WECP discussed the pros and cons of all three options and selected Program B as the optimal choice for the City. Program B, discussed in later sections, presents a tempered approach to the City's water conservation program without engaging in cost-prohibitive projects with marginal returns on costly upgrades.

7.6.1. Conservation Program Analysis

The WECP outlined the City's water conservation program successes to date. The following programs have been implemented by the City over the years to much success. As mentioned previously, ongoing conservation programs include:

- AMI Leak Alerts
- Leak Free Sacramento
- Leak Repair Assistance Rebate
- Turfgrass Conversion Rebates
- Smart Controller Rebates
- High Efficiency Toilet Rebates
- High Efficiency Clothes Washer Rebates
- Rain barrel and Greywater Rebates

Conservation Program Alternatives

Conservation program alternatives were designed to refresh the current program and help the City meet its water conservation objectives. Ultimately, the alternatives were designed to satisfy the regulatory requirements under the "*Making Water Conservation a California Way of Life*." To ensure adaptability in its water conservation strategy, the City and Maddaus Water

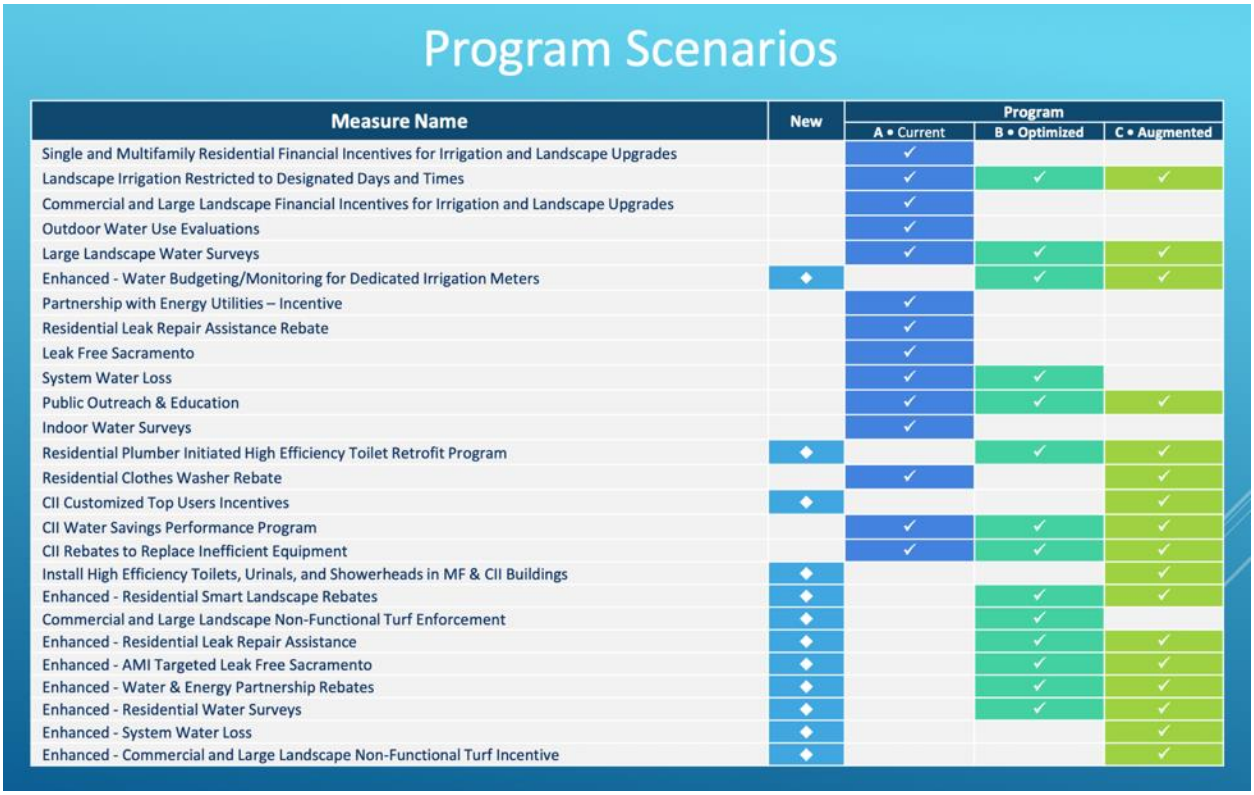
[141] California Senate Bill 606 and Assembly Bill 1668.

Management developed three conservation program alternatives. Each alternative was built from modeled measures and tailored to a different level of anticipated water use. An overview of program alternatives are shown in **Figure** 7-1.

Program A – *Current Program* – includes only existing conservation activities, represents a continuation of the City's ongoing efforts and serves as a baseline for comparison. Fundamentally, the current program, or status quo, is effective and resulted in considerable water savings over the years. The City has been a leader in water conservation and the Current Program would continue to execute in a similar manner.

Program B – *Optimized Program* – includes all existing conservation activities covered by the *Current Program*, as well as new and enhanced measures with favorable benefit-cost-ratios and/or high savings potential. Represents a modification of existing conservation activities plus an expansion of the City's overall conservation potential. Program B builds on the success of the Status Quo by optimizing current budget and staffing resources to focus on the most valued water savings, while not pursuing cost-prohibitive programs and projects. It provides a measured alternative for the City, should it decide to buildout its water conservation program further than present.

Program C – Expanded Program – enhances Program B by substituting current conservation measures with new and improved ones to maximize water savings. This proactive approach creates a large buffer between projected water use and the compliance threshold, mitigating risks from demand spikes or future UWUO requirements. However, Program C is significantly more expensive and staff intensive. While more expensive, Program C includes more individual measures on different implementation schedules, its per-unit savings are comparable to Program B. The variances in water savings and benefit-cost ratios (BCRs) between the programs are direct results of their distinct measures, budgets, and timelines as modeled in this plan's DSS.



Measure Name	New	Program		
		A • Current	B • Optimized	C • Augmented
Single and Multifamily Residential Financial Incentives for Irrigation and Landscape Upgrades		✓		
Landscape Irrigation Restricted to Designated Days and Times		✓	✓	✓
Commercial and Large Landscape Financial Incentives for Irrigation and Landscape Upgrades		✓		
Outdoor Water Use Evaluations		✓		
Large Landscape Water Surveys		✓	✓	✓
Enhanced - Water Budgeting/Monitoring for Dedicated Irrigation Meters	◆		✓	✓
Partnership with Energy Utilities – Incentive		✓		
Residential Leak Repair Assistance Rebate		✓		
Leak Free Sacramento		✓		
System Water Loss		✓	✓	
Public Outreach & Education		✓	✓	✓
Indoor Water Surveys		✓		
Residential Plumber Initiated High Efficiency Toilet Retrofit Program	◆		✓	✓
Residential Clothes Washer Rebate		✓		✓
CII Customized Top Users Incentives	◆			✓
CII Water Savings Performance Program		✓	✓	✓
CII Rebates to Replace Inefficient Equipment		✓	✓	✓
Install High Efficiency Toilets, Urinals, and Showerheads in MF & CII Buildings	◆			✓
Enhanced - Residential Smart Landscape Rebates	◆		✓	✓
Commercial and Large Landscape Non-Functional Turf Enforcement	◆		✓	
Enhanced - Residential Leak Repair Assistance	◆		✓	✓
Enhanced - AMI Targeted Leak Free Sacramento	◆		✓	✓
Enhanced - Water & Energy Partnership Rebates	◆		✓	✓
Enhanced - Residential Water Surveys	◆		✓	✓
Enhanced - System Water Loss	◆			✓
Enhanced - Commercial and Large Landscape Non-Functional Turf Incentive	◆			✓

FIGURE 7-1: CONSERVATION PROGRAM ALTERNATIVES[142]

7.6.2. Program B – Optimized Program

Of the three conservation program alternatives, Program B, or the 'Optimized' Program, was selected based on its ability to strategically and cost-effectively increase conservation while positioning the City to meet future regulatory requirements and sustainability goals. Program B includes existing conservation programs as well as new and enhanced measures with favorable benefit-cost-ratios and/or high savings potential. Moreover, it represents a modification of the City's existing conservation programs to optimize resources while expanding the portfolio's overall conservation potential.

When funded after Fiscal Year 2028, Program B would result in an expansion of the current water conservation program budget and may result as well in an expansion of the City's water conservation staff, with one Water Conservation Supervisor and data analyst, bringing on a total of 13 full-time equivalent staff. With the anticipated new regulations (e.g., UWUOs) and the staff needs; Program B and reporting process would benefit from having a dedicated Supervisor below the Water Conservation Coordinator, to manage and streamline the

[142] City of Sacramento Department of Utilities, Sacramento's Water Conservation Program Highlights & Future Vision presentation to Water Forum. May 21, 2025.

program. A hallmark of Program B is its quantifiable doubling of the present value of water savings over the forecast period compared to the *Current Program* and decreases to the cost per unit of water saved, compared to Program C, which quadruples the present value of water savings compared to the current program. However, implementation of Program C will cost the City approximately 47% more than Program B and influenced the WECP's selection of Program B.

Notably, average annual utility costs are estimated to increase by 28% to fully implement Program B compared to the *Current Program*, however, this is tempered by an overall increase in water savings and cost-efficiency improvements from the increased conservation activities.[143] Several takeaways from estimated Program B costs and savings include: 717 MGY in Maximum Water Savings by 2030; Per Capita Demand of 153 GPCD by 2030; and $24.5 million in water cost savings.

Program B reflects a moderate yet strategic expansion of conservation efforts. It considers future uncertainties related to the Commercial Outdoor Water Use Standard, future water costs, and potential climate impacts, and how to mitigate such factors. The WECP is attached as Appendix X for review.

7.6.3. Program Implementation

The goal of the Optimized Program's Strategy is to maintain or enhance current measures and supplement additional high-savings activities that help the City achieve regulatory compliance. As such, the rollout of the Optimized Program's activities follow these regulatory timelines. Higher priority conservation measures have earlier starting years than lower priority conservation measures.

In addition to the initiation of Program B, the Plan suggested the following recommendations to the City's existing conservation programs:

- Sunset Existing Toilet Rebate Program
- Sunset Existing Clothes Washer Rebates
- Examine the effectiveness of Smart Water Controller Exceptions
- Review and adjust rebate values
- Annual review of water demands and projections

The selected Program emphasizes long-term behavioral change rather than short-term emergency conservation.

[143] City of Sacramento Water Efficiency and Conservation Plan at p. 51.

Water Loss Performance Standard takes effect on January 1, 2028

- The City's Real Water Loss Standard is 41 gallons per connection per day.

7.6.4. WECP Summary

The 2025 WECP was developed to help the City meet near- and long-term regulatory requirements while strengthening its existing conservation program in coordination with the Regional Water Authority. The WECP establishes a cost-effective, data-driven roadmap to comply with new statewide standards enacted under SB 606, AB 1668, and the "Making Water Conservation a California Way of Life" regulation. Building on the City's established conservation framework, the WECP identifies compliance gaps and incorporates flexibility to address future demand uncertainties. Using historical conservation data, demographic and demand projections, staff input, and DSS modeling, the City evaluated 26 conservation measures and developed three program alternatives. Program B was selected as the preferred approach, reflecting a balanced expansion of conservation efforts designed to address regulatory changes, commercial outdoor water use standards, rising water costs, and climate variability. The WECP also emphasizes adaptive management through annual performance tracking and regular model updates to ensure ongoing compliance with evolving UWUO standards.

7.7. Members of California Water Efficiency Partnership

In 2018, the California Water Efficiency Partnership (CalWEP) was formed to consolidate statewide expertise on water issues, challenges, and opportunities to advance water efficiency at both the agency and statewide levels. CalWEP evolved from the California Urban Water Conservation Council (CUWCC), which had administered a collaborative agreement between SWRCB, DWR, water utilities, environmental organizations, and other interested parties to implement best management practices aimed at reducing water use across California. The City participated in CUWCC from 1995 until its transition to CalWEP in 2018 and remains an active CalWEP member. Through CalWEP, members benefit from networking and partnership opportunities that strengthen water efficiency and conservation programs. The organization is structured around two primary committees: the Research and Evaluation Committee, which collaboratively identifies and advances research initiatives to support member agencies, and the Program Committee, which shares program needs, successes, and challenges while developing actionable strategies to enhance water conservation efforts.

Appendix A
City of Sacramento
Water Shortage Contingency Plan

[placeholder – public draft is separate document]

Appendix B

[placeholder]

Appendix C

[reserved]

Appendix D

[reserved]

Appendix E

[reserved]

Appendix F

[reserved]