2025 URBAN WATER MANAGEMENT PLAN

FOR THE CITY AND COUNTY OF SAN FRANCISCO

June 2026

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

ON THE COVER

Clockwise from top left: Westside Enhanced Water Recycling Project at Oceanside Wastewater Treatment Plant with a living roof, the Sunol Water Temple in Alameda County, an aerial view of San Francisco, and Lower Crystal Springs Reservoir in San Mateo County.

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ACRONYMS AND ABBREVIATIONS

Act	California Urban Water Management Planning Act
AF	acre-feet (volume of water, equivalent to 325,851 gallons)
AWS	Alternative Water Supply Program
AWWA	American Water Works Association
BACWA	Bay Area Clean Water Agencies
BARR	Bay Area Regional Reliability
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPL	Bay Division Pipeline
BG	billion gallons
BMP	Best Management Practice
CCF	hundred cubic feet (volume of water, equivalent to 748 gallons)
CEQA	California Environmental Quality Act
CIP	Capital Improvement Program
City	City and County of San Francisco
CSA	County Service Area
CSD	Community Services District
CWC	California Water Code
DRA	drought risk assessment
DSOD	Division of Safety of Dams
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
EOP	Emergency Operations Plan
FERC	Federal Energy Regulatory Commission
FY	fiscal year
GPCD	gallons per capita per day
GSP	Groundwater Sustainability Plan
HHLSM	Hetch Hetchy and Local Simulation Model
HHWP	Hetch Hetchy Water and Power
HRL	Agreements to Support Healthy Rivers and Landscapes
HTWTP	Harry Tracy Water Treatment Plant
ISG	Individual Supply Guarantee
LOS	Level of Service
LTVA	Long Term Vulnerability Assessment
MG	million gallons
MGD	million gallons per day (flow or usage rate of water)

MWC	Mutual Water Company
NBSU	North Bayside System Unit
PFAS	Per- and polyfluoroalkyl substances
RCP	Representative Concentration Pathway
RGSR	Regional Groundwater Storage and Recovery
RWS	San Francisco Regional Water System
SB	Senate Bill
SB X7-7	Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009 (a.k.a., Water Conservation Act of 2009)
SF	San Francisco
SFDPH-EH	San Francisco Department of Public Health-Environmental Health
SFGW	San Francisco Groundwater Supply Project
SFO	San Francisco International Airport
SFPUC	San Francisco Public Utilities Commission
SGMA	Sustainable Groundwater Management Act
State	State of California
SVCF	Sunol Valley Chloramination Facility
SVWTP	Sunol Valley Water Treatment Plant
SWRCB	State Water Resources Control Board
SWRCB DDW	State Water Resources Control Board Division of Drinking Water
TIWRRF	Treasure Island Water Resource Recovery Facility
USEPA	U.S. Environmental Protection Agency
UWMP	Urban Water Management Plan
Valley Water	Santa Clara Valley Water District
WPCP	water pollution control plant
WSA	Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County
WSAP	Water Shortage Allocation Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water System Improvement Program

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SECTION 1: INTRODUCTION AND OVERVIEW

The San Francisco Public Utilities Commission (SFPUC) proudly presents the 2025 Urban Water Management Plan (UWMP) for the City and County of San Francisco (City). This plan provides a comprehensive overview for ensuring a reliable, sustainable water supply for the next 25 years, balancing the needs of residents, businesses, and the environment in an era of growth and uncertainty.

The City owns and operates the San Francisco Regional Water System (RWS), a vital public asset that delivers high-quality drinking water to more than 2.7 million residents and thousands of businesses across the San Francisco Bay Area. About 85% of this water originates from the Tuolumne River watershed and is stored in Hetch Hetchy Reservoir within Yosemite National Park. The remaining supply comes from protected local watersheds in the East Bay and on the Peninsula.

With the RWS, the SFPUC delivers water to 28 wholesale customers, including cities, water districts, an investor-owned utility, and a university in Alameda, Santa Clara, and San Mateo Counties, and Groveland Community Services District in Tuolumne County. The Bay Area Water Supply and Conservation Agency (BAWSCA) represents the interests of 26 of the wholesale customers (collectively referred to as the "Wholesale Customers"), not including Cordilleras Mutual Water Company and Groveland Community Services District, and coordinates water conservation programming on their behalf. The SFPUC also serves retail customers in San Francisco (generally referred to as in-City retail customers) and hundreds of customers outside of San Francisco that are located along the RWS transmission system (generally referred to as suburban retail customers). Some retail customers also receive local groundwater and recycled water supplies, further diversifying the system.

The 2025 UWMP updates the 2020 UWMP and incorporates updated water demand projections, supply reliability, and strategies to meet future challenges. Retail water demand is estimated at 62.5 million gallons per day (MGD) in 2025 and is projected to rise by 17%, or to 73.4 MGD, by 2050. Meanwhile, housing unit projections are expected to grow from about 418,000 units to 559,000 units, a 34% increase over the same period. Retail demand projections incorporate the latest housing and employment growth projections, socioeconomic trends, and conservation assumptions. These projections also account for conservation measures and align with the SFPUC's 2025 Retail Water Conservation Plan.

Meeting projected demands will require a combination of surface water and alternative supplies. While the RWS remains the primary component of the system, local water supplies are becoming increasingly important. By 2050, groundwater production within the City will ramp up to about 4.3 MGD and recycled water projects (including the Westside Enhanced Water Recycling Project and Treasure Island Water Resource Recovery Facility Project) will provide an additional 2.4 MGD. Onsite water reuse, mandated for large new developments, is expected to offset another 1.6 MGD by 2050. Water conservation programs will continue to drive efficiency and are expected to contribute to 0.7 MGD in active conservation savings. These programs support San Francisco as a leader in water efficiency within California, where the average residential per-capita water use is expected to decrease from 43 to 38 gallons per day by 2050.

Since the adoption of the 2020 UWMP, the region has experienced significant challenges. The COVID-19 pandemic reshaped water-use patterns as remote work became widespread. California also endured another drought from 2021-2023, when the state declared a water shortage emergency requiring water suppliers to implement Level 2

shortage actions under their Water Shortage Contingency Plans (WSCPs). This updated UWMP includes the WSCP and details the SFPUC's emergency preparedness strategies for catastrophic supply interruptions.

This UWMP evaluates water supply reliability under multiple scenarios. Under normal conditions, the RWS can meet projected demands through 2050. However, regulatory changes pose significant risks. In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment). The Bay-Delta Plan Amendment established new flow objectives for three Lower San Joaquin River tributaries, including the Tuolumne River. SWRCB adopted the Bay-Delta Plan Amendment with the goal of increasing salmonid populations in these three tributaries and the Bay-Delta. The Bay-Delta Plan Amendment requires each tributary to bypass 30% to 50% of the flow of each river from February through June of every year. The Bay-Delta Plan Amendment refers to this as the "unimpaired flow percentage." If fully implemented, the Bay-Delta Plan Amendment could reduce RWS supplies by up to 43% during prolonged droughts. After allocating available RWS supplies between retail and Wholesale Customers according to the Water Shortage Allocation Plan and comparing total supplies to projected demands, the retail portion of supplies shows a shortage of up to 29%, and Wholesale Customer supplies show a shortage of up to 49%. Without the implementation of the Bay-Delta Plan Amendment, there will be no shortages even in five consecutive dry years at 2050 demand levels.

In response to the Bay-Delta Plan Amendment, the SFPUC and the Modesto and Turlock Irrigation Districts proposed the Tuolumne River Voluntary Agreement, now referred to as the Tuolumne River Healthy Rivers and Landscapes Agreement, which combines flow and non-flow measures to improve native salmon populations in the lower Tuolumne River. The Tuolumne River is part of the multi-agency Healthy Rivers and Landscapes Program, proposed by Sacramento and San Joaquin River water agencies, which balances environmental and water-supply needs. This Healthy Rivers and Landscapes Program, including the Tuolumne River's proposed contributions, is being evaluated by the SWRCB. Given the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the UWMP evaluates water supply reliability under two supply scenarios: with implementation of the Bay-Delta Plan Amendment and continuation of current conditions (which represents delays in implementation of the Bay-Delta Plan Amendment).

To prepare for these uncertainties, the SFPUC established the Alternative Water Supply (AWS) Program in 2019 to identify new dry-year water supply projects. This program explores projects such as purified water opportunities, regional storage expansions, and brackish water desalination. In 2024, the SFPUC published the AWS Plan to guide its decision-making, provide recommendations on project implementation, and identify areas requiring further analysis to meet future water supply challenges and vulnerabilities, such as climate change, regulatory shifts, seismic risks, and population growth. The SFPUC anticipates updating the AWS Plan in FY 2026-27.

In preparing this UWMP, the SFPUC conducted a sensitivity analysis to identify key drivers of demand variability. The results informed two additional demand scenarios that reflect a range of potential retail water demands based on different population and employment growth assumptions. Together, these analyses, projections, and planning efforts position the SFPUC to navigate an increasingly complex water supply landscape. The 2025 UWMP provides an assessment of future challenges and outlines the strategies needed to maintain reliable service for retail and wholesale customers.

SECTION 2: PLAN PREPARATION AND IMPLEMENTATION

This section summarizes the SFPUC's actions to assure agency coordination and public participation throughout the development of this 2025 UWMP.

2.1 BASIS FOR PREPARING A PLAN

The SFPUC prepared this 2025 UWMP in accordance with the requirements of the California Urban Water Management Planning Act (Act), California Water Code (CWC) Division 6, Part 2.6, Sections 10610 through 10657. The purpose of the Act is to assure that water suppliers plan for long-term reliability, conservation, and efficient use of California's water supplies to meet existing and future demands. The Act requires that planning projections extend at least 20 years beyond the year of the UWMP, i.e., through 2045 for the 2025 UWMP cycle. The planning horizon for the SFPUC's 2025 UWMP is 25 years, i.e., through 2050. The demand projections developed in accordance with the UWMP Act (i.e., demands that are based on population estimates from the local land use authority) will not be used to determine SFPUC's future rates or capital spending. Rate-setting and capital planning are conducted through separate processes.

The Act also requires urban water suppliers to update its UWMP every five years. The 2025 UWMPs are due to the California Department of Water Resources (DWR) by July 1, 2026. As defined by CWC Section 10617, an urban water supplier is a supplier (either publicly or privately owned) that provides water for municipal purposes to more than 3,000 customers (either directly or indirectly) or that supplies more than 3,000 acre-feet of water annually. The SFPUC meets these criteria as both a retail and wholesale supplier of water.

The SFPUC prepared this individual UWMP specifically for the City and is not participating in the preparation of a regional UWMP.

2.2 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

The data provided throughout this 2025 UWMP and the accompanying submittal tables are reported on a fiscal year (FY) basis. The SFPUC operates on a fiscal year that starts on July 1 and ends on June 30. The "current" fiscal year reported in this 2025 UWMP corresponds to FY 2024-2025, which represents the period from July 1, 2024 through June 30, 2025. Similarly, the projected year of 2030 denotes FY 2029-2030; 2035 denotes FY 2034-2035; and so on. The SFPUC has employed its best efforts to convert data that were originally collected on a calendar year basis to a fiscal year basis. However, in a few cases, fiscal year quantities are approximated based on calendar year quantities and are noted as such.

The SFPUC's water supply planning, contracts, and related documents primarily use units of million gallons per day (MGD) when quantifying volumes of water. The submittal tables prescribed by DWR allow volumetric water data to be reported in units of acre-feet (AF), million gallons (MG), or hundred cubic feet (CCF) per year. This 2025 UWMP's submittal tables include data in units of MG rounded to the nearest MG (see Appendix A). The corresponding data in the body of this 2025 UWMP are reported in units of MGD unless otherwise noted. Although reported in different units of measure, the quantities in both sets of data are equal. DWR staff confirmed the use of this approach for this 2025 UWMP. This approach differs from the SFPUC's previous UWMPs, which reported data in the submittal tables in AF. The SFPUC's change to MG in the 2025 submittal tables is based on DWR's recommendation to make the units in the body of the UWMP and the submittal tables as consistent as possible.

2.3 COORDINATION AND OUTREACH

2.3.1 Agency Coordination

2.3.1.1 Coordination with City Agencies

The SFPUC coordinated internally and with other City agencies to develop elements of this 2025 UWMP and the documents referenced herein. The SFPUC utilized San Francisco housing and employment growth projections provided by the San Francisco Planning Department to develop water demand projections. The SFPUC also notified other City agencies of its intent to prepare the 2025 UWMP. The notice included instructions for viewing the Draft 2025 UWMP, as well as the date, time, and location of the public hearing on the UWMP. Documentation relating to these efforts and communications is provided in Appendix B.

2.3.1.2 Regional Interagency Coordination

The SFPUC coordinated the development of this 2025 UWMP with its wholesale customers and BAWSCA. The SFPUC has individual water sales contracts with 27 wholesale customers, 26 of which are members of BAWSCA. Cordilleras Mutual Water Company (Cordilleras MWC) is a wholesale customer that contracts directly with the SFPUC but is not a member of BAWSCA. Groveland Community Services District (Groveland CSD) is considered a suburban retail customer by the SFPUC, but for the purposes of this 2025 UWMP, it is recognized as a wholesale customer, as further described in Section 2.4. Throughout this document, references to Wholesale Customers mean the 26 wholesale customers that are members of BAWSCA. For more information about the SFPUC's wholesale customers, see Section 3.3.

The SFPUC provided water supply reliability information to BAWSCA for distribution to all its members. The SFPUC projected RWS supplies in five-year increments from 2025 through 2050 for normal, single dry, and multiple dry years. The SFPUC also worked with its Wholesale Customers through BAWSCA to obtain population and water supply purchase projections in five-year increments through the year 2050. Wholesale Customers that are urban water suppliers subject to the UWMP Act are concurrently preparing their own 2025 UWMPs. Therefore, the data provided to the SFPUC for the SFPUC's use in the development of this 2025 UWMP are subject to change.

The SFPUC notified all wholesale customers to which the SFPUC provides water of the intent to prepare the 2025 UWMP. This notice included instructions for viewing the Draft 2025 UWMP and attending the public hearing on the Draft 2025 UWMP. The SFPUC reviewed and addressed, as appropriate, public comments received on the Draft 2025 UWMP. Documentation relating to these efforts and communications is provided in Appendix B.

2.3.2 Public Participation

The SFPUC encourages public participation in its urban water management planning efforts. Public outreach activities for the 2025 UWMP are listed below. Further documentation is included in Appendix B. Notification of the 2025 UWMP was emailed on February 12, 2026 and March 12, 2026 to all cities within which the SFPUC provides water, as well as to other interested parties. This notification served as both (1) a notice to cities and counties about the 2025 UWMP, and (2) a notice of the time and place of the public hearing, as required by the CWC. A list of notified organizations and individuals is provided in Appendix B.

The Draft 2025 UWMP was made available for public review between March 16 and April 20, 2026 at **www.sfpuc.gov/uwmp**. The SFPUC met with the Citizens' Advisory Committee on March 17, 2026 to present the Draft 2025 UWMP. The Citizens' Advisory Committee meetings were publicly noticed at **www.sfpuc.gov**.

A public hearing on the Draft 2025 UWMP was held on April 14, 2026 during an SFPUC Commission meeting. Notice of the hearing was published in a local newspaper on March 30 and April 6, 2026 in accordance with California Government Code Section 6066. A copy of the notice is included in Appendix B. The SFPUC accepted verbal comments at the hearing and written comments submitted during the public comment period. The adoption hearing for the 2025 UWMP is scheduled for the June 23, 2026 SFPUC Commission meeting. A copy of the Commission resolution adopting the 2025 UWMP will be provided in Appendix G. For further information on the UWMP's submittal, availability, and implementation, see Section 11.3.

2.4 ACCOUNTING FOR GROVELAND CSD

Groveland CSD serves about 3,500 residential and commercial water customers in Groveland, Big Oak Flat, and Pine Mountain Lake, a semi-rural area of southern Tuolumne County. Before 2015, the UWMP listed Groveland CSD as a retail customer because Groveland CSD had not prepared its own UWMP. Starting with the 2015 UWMP, the SFPUC reported Groveland CSD as a wholesale customer since it now prepares its own UWMP. The SFPUC still treats Groveland CSD as a suburban retail customer for contractual obligations and supply planning purposes. However, beginning with the 2015 UWMP, DWR directed the SFPUC to report Groveland CSD as a wholesale customer.

To meet both the SFPUC's planning needs and DWR's reporting requirements, this UWMP classifies Groveland CSD differently (either as a suburban retail customer or a wholesale customer) depending on the context:

- **DWR reporting (Sections 3, 9, and Appendix A):** Groveland CSD is treated as a wholesale customer for describing the SFPUC's wholesale service area, population, demands, WSCP, and to avoid double counting in regional or statewide aggregation of UWMP data.
- **Contractual obligations, RWS supply allocations, and retail conservation programs (Sections 4, 6, 7, 8, and 10):** Groveland CSD is treated as a retail customer.
- **SB X7-7 baselines and targets (Section 5 and SB X7-7 Compliance Form in Appendix A):** Groveland CSD is treated as a wholesale customer and therefore excluded from per capita baselines and targets.

Groveland CSD provided current and projected population and demand data for the preparation of the 2025 UWMP. Because Groveland CSD is preparing its own 2025 UWMP, the data it supplied may change. Any discrepancies between tables in the body of this 2025 UWMP and Appendix A resulting from these differing classifications of Groveland CSD will be noted. DWR staff have reviewed and agreed with this approach.

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SECTION 3: SYSTEM DESCRIPTION

This section describes the SFPUC's water system (including the RWS and in-City distribution system) and the SFPUC's retail and wholesale service areas, including their climate and demographic features.

3.1 SFPUC WATER SYSTEM OVERVIEW

Over 2.7 million people and thousands of businesses in the San Francisco Bay Area rely on water supplied by the SFPUC, a department of the City and County of San Francisco, to meet their daily water needs. The City-owned and operated RWS, which serves both retail and wholesale customers, supplies high-quality drinking water from the Tuolumne River watershed and from the local Alameda and Peninsula watersheds. The RWS draws an average of 85% of its supply from the Tuolumne River watershed, collected in Hetch Hetchy Reservoir in Yosemite National Park. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining 15% of the RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The percentage split between these water sources varies from year to year depending on the water year hydrology and operational circumstances.

The SFPUC provides retail water service to customers both inside and outside of San Francisco (collectively referred to as the retail customers). Most of the retail customers are located inside of San Francisco and are referred to as the "in-City" retail customers. The small number of retail customers outside of San Francisco are located along the RWS transmission system and are referred to as "suburban" retail customers. The in-City distribution system serves a residential population of nearly 850,000 in addition to San Francisco-based businesses. The suburban retail customers include a residential population of approximately 2,000, as well as businesses and institutions, in San Mateo, Santa Clara, Alameda, Tuolumne, and San Joaquin Counties. In-City retail customers are primarily served with RWS supply, but some customers also receive groundwater and recycled water from the SFPUC or other providers. Similarly, the suburban retail customers are primarily served with RWS supply, with one customer also receiving groundwater. The RWS, in-City distribution system, and other localized systems owned and operated by the SFPUC are described in the following sections.

3.1.1 Historical Development of the RWS

The RWS evolved through the development of two separate water systems: the Spring Valley Water Company system and the Hetch Hetchy Water and Power Project (HHWP Project). The Spring Valley Water Company was established in 1858 as it developed a spring and several creeks in San Francisco into a local water system. It expanded over the next few decades with the construction of the Pilarcitos, San Andreas, and Upper and Lower Crystal Springs Dams on the Peninsula. Further expansions included the development of the Pleasanton Well Field, the Sunol Filter Gallery, and Calaveras Dam in southern Alameda County.

Very early in San Francisco's development, it was recognized that the local water resources would be inadequate to support a burgeoning metropolis; thus, plans for importing water from the Sierra Nevada were born. In the late 1800s, the City's decision to develop its own water supply system culminated in the planning, financing, and construction of the HHWP Project. Because many of the HHWP Project facilities were to be located on public land within Yosemite National Park and Stanislaus National Forest, Congressional approval of the use of federal land was required. That approval was granted by the Raker Act of 1913 (38 Stat. 242). For more information about the Raker Act and the City's water rights under state law, see Section 6.1.1.

The construction of the HHWP began in earnest in 1914. After almost 20 years of construction (including the building of Hetch Hetchy Reservoir and the 1930 acquisition of the Spring Valley Water Company by the City), Tuolumne River water began flowing into Upper Crystal Springs Reservoir in October 1934. Through the coordinated operation of the two systems, the SFPUC has been able to provide the residents of the City and its neighboring communities with a supply of high-quality potable water from protected watershed sources.

Since the 1930s, the major additions to the RWS have included the raising of O'Shaughnessy Dam, the construction of Cherry Valley Dam (Cherry Lake); the construction of Canyon Power Tunnel and Kirkwood Powerhouse; the construction of additional pipelines across the San Joaquin Valley and the Rock River Lime Plant; and the local construction of San Antonio Reservoir in Alameda County and Bay Division Pipelines (BDPL) Nos. 2, 3, 4, and 5. Other local projects have included Crystal Springs Pipeline No. 3, Sunol Valley and San Andreas (now Harry Tracy) Water Treatment Plants, the Crystal Springs Bypass Tunnel and Balancing Reservoir, and the Tesla Treatment Facility.

3.1.2 Water Distribution

This section further describes how water is distributed by the RWS and the in-City distribution system.

3.1.2.1 Regional Water System

The RWS, shown in Figure 3-1, consists of more than 280 miles of pipelines, 60 miles of tunnels, 11 reservoirs, five pump stations, two water filtration plants, and two treatment facilities for pH adjustment and/or disinfection. It includes the HHWP Project and the Bay Area water system facilities. The HHWP Project is composed of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from Hetch Hetchy Reservoir west to the Alameda East Portal of the Coast Range Tunnel in the Sunol Valley. Water system components of the HHWP Project are also referred to as the Hetch Hetchy System. The Bay Area water system is composed of two parts, the Alameda System and the Peninsula System, generally consisting of the facilities west of the Alameda East Portal of the Coast Range Tunnel, including the 63,000-acre Alameda and Peninsula watersheds, storage reservoirs, two water filtration plants, and the distribution system that delivers water to both retail and wholesale customers. The Hetch Hetchy, Alameda, and Peninsula Systems are described in more detail below.

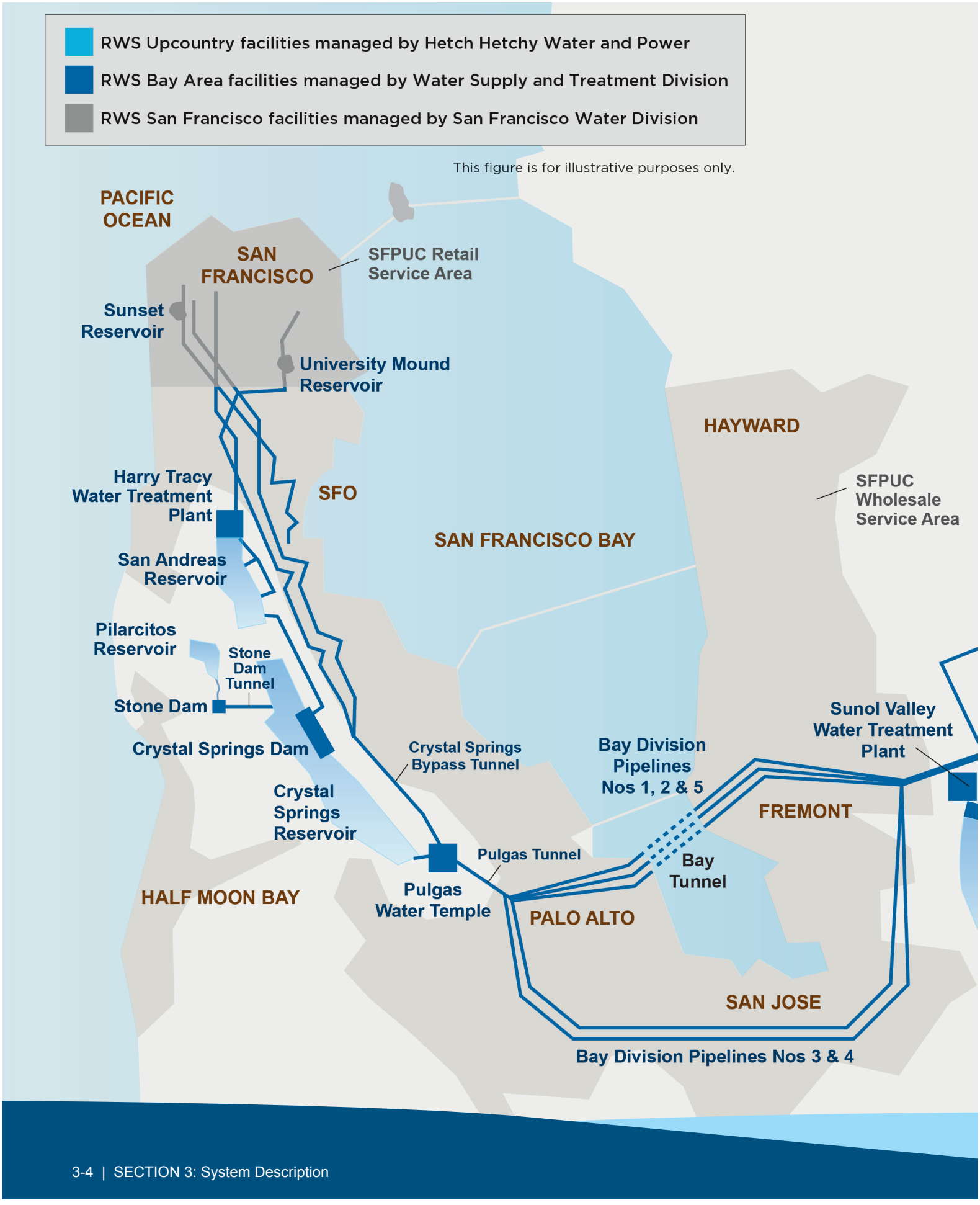
- **Hetch Hetchy System:** In the Hetch Hetchy System, water is diverted from the Tuolumne River watershed into Hetch Hetchy Reservoir. The water is then transported in a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel, which connects to the Alameda System at the Alameda East Portal. Hetch Hetchy System water is disinfected at the Tesla Treatment Facility.

- **Alameda System:** The Alameda System includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds in Alameda County. San Antonio Reservoir also receives water from the Hetch Hetchy System. Conveyance facilities in the Alameda System, including the Irvington Tunnels and the BDPLs, connect the Hetch Hetchy System and Alameda System to the Peninsula System. The BDPLs traverse the South Bay and cross to the Bay Tunnel to meet the Peninsula System, delivering water to customers along the pipeline routes. The Sunol Valley Water Treatment Plant (SVWTP) filters and disinfects water supplied from San

Antonio Reservoir and Calaveras Reservoir. The Sunol Valley Chloramination Facility (SVCF) treats Hetch Hetchy supplies with aqueous ammonia to form chloramines and with sodium hydroxide to adjust the pH. Water is then blended into the Alameda Siphons for delivery to Bay Area customers via the Irvington Tunnels.

- **Peninsula System:** The Peninsula System includes conveyance facilities connecting the BDPLs to the distribution system in San Francisco and to other customers on the Peninsula. Two reservoirs, Crystal Springs Reservoir and San Andreas Reservoir, collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. A third reservoir, Pilarcitos Reservoir, collects runoff from the Pilarcitos Creek watershed and directly serves one of SFPUC's Wholesale Customers, Coastside County Water District (which serves the City of Half Moon Bay), in addition to delivering water to Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant (HTWTP) filters and disinfects water supplied from Crystal Springs Reservoir and San Andreas Reservoir before it is delivered to customers on the Peninsula and in San Francisco.

Figure 3-1. The Regional Water System and Main Facilities




Cherry
Reservoir
and Dam
Lake Eleanor
and Dam
Cherry Power Tunnel
Holm
Powerhouse
Canyon
Power
Tunnel
Hetch Hetchy
Reservoir
TUOLUMNE
RIVER
O'Shaughnessy Dam
Mountain
Tunnel
Kirkwood
Powerhouse
San Antonio
Reservoir and Dam
Foothill
Tunnel
Priest
Reservoir
San Joaquin
Pipelines
Moccasin
Powerhouse,
Reservoir, and Dam
YOSEMITE
NATIONAL
PARK
Coast Range
Tunnel
Alameda
East Portal
Tesla Treatment
Facility
Don Pedro
Reservoir
MODESTO
Calaveras Dam
& Reservoir

3.1.2.2 In-City Distribution System

San Francisco's in-City distribution system (Public Water System No. CA3810011) was originally developed during the 100-year period between 1860 and 1960, reflecting the patterns and rates of growth in the City. Several major pipelines convey RWS supply from the Peninsula System to the City. Two pipelines feed water to the eastside of the in-City distribution system and terminate at University Mound Reservoir. Two additional pipelines feed water to the west side of the in-City distribution system and terminate at Sunset Reservoir and at Merced Manor Reservoir. As shown in Figure 3-2, the in-City distribution system also includes ten reservoirs (two are split into two basins) and eight water tanks that store water supplied by the RWS. Seventeen pump stations[1] and approximately 1,250 miles of pipelines move water throughout the City and deliver water to homes and businesses.

3.1.3 Water Treatment

The Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast and one of only a few large unfiltered municipal water supplies in the nation. The water originates from well-protected wilderness areas in Yosemite National Park and flows down the Tuolumne River to Hetch Hetchy Reservoir. This water meets or exceeds all federal and State of California (State) drinking water standards. Water from Hetch Hetchy Reservoir, which is protected in pipes and tunnels as it is conveyed to the Bay Area, requires pH adjustment to control pipeline corrosion and disinfection. Based on the SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the United States Environmental Protection Agency (USEPA) and the State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) determined that the Hetch Hetchy water source meets federal and state drinking water quality requirements without the need for filtration.

The Tesla Treatment Facility is an ultraviolet treatment facility with a capacity of 315 MGD that provides primary disinfection using chlorine and fluoridation in compliance with *Cryptosporidium* requirements for all unfiltered sources. The facility was a key component of the SFPUC's Water System Improvement Program (WSIP) and enhances the high water quality from the RWS.

The SFPUC treats all water derived from sources other than Hetch Hetchy Reservoir at one of two water filtration facilities: SVWTP or HTWTP. SVWTP primarily treats water from the Alameda System reservoirs and upcountry non-Hetch Hetchy sources (if used) and has a design capacity of 160 MGD. Treatment processes include powder activated carbon for taste and odor control, coagulation, flocculation, sedimentation, filtration, disinfection, fluoridation, corrosion control, and chloramination. The nearby Sunol Valley Chloramination Facility can also provide fluoridation, chloramination, and corrosion control treatment for the Hetch Hetchy System (as defined in Section 3.1.2.1) and blend with water treated from SVWTP. HTWTP treats water from the Peninsula System reservoirs and has a design capacity of 140 MGD. Treatment processes at HTWTP include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control, and chloramination. The SFPUC completed major upgrades to SVWTP in 2013 and HTWTP in 2015. Major work started in 2025 to add ozonation at SVWTP for additional taste and odor treatment.

[1] This number of pump stations does not include three pump stations on Treasure Island, which are not operated by the SFPUC.

Figure 3-2. In-City Distribution System

3.1.4 Water Storage

Most of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy, Cherry (previously referred to as Lake Lloyd), and Lake Eleanor. The storage capacity of these three reservoirs is included in Table 3-1. A "water bank" in Don Pedro Reservoir is also integrated into RWS operations.[2] Don Pedro Reservoir, which is jointly owned and operated by Modesto Irrigation District and Turlock Irrigation District (the Districts), is located on the Tuolumne River downstream of the Hetch Hetchy System.

San Francisco generates hydroelectric power through the HHWP Project as a by-product of water delivery and water supply management. Water released from Hetch Hetchy Reservoir is used for hydroelectric generation and provides instream flows when released downstream. Normally, only Hetch Hetchy Reservoir water supplies are exported to the Bay Area, while releases from Lake Eleanor and Cherry Lake are used to provide instream flows, satisfy the Districts' Raker Act allocations, and produce hydroelectric power. The HHWP Project includes four hydroelectric powerhouses along the Tuolumne River (Holm, Kirkwood, Moccasin, and Moccasin Low Head) that have a collective generating capacity of nearly 400 megawatts.

In the Bay Area, the SFPUC utilizes the local Peninsula and Alameda watersheds. Crystal Springs, San Andreas, and Pilarcitos Reservoirs, located in San Mateo County, capture local runoff in the Peninsula watershed, and Calaveras and San Antonio Reservoirs, located in Alameda County, capture local runoff in the Alameda watershed. In addition to capturing local runoff, San Andreas, San Antonio, and Crystal Springs Reservoirs provide storage for water conveyed to the Bay Area from the Hetch Hetchy System. These five local reservoirs are an important water supply source in the event there is an interruption of Hetch Hetchy System deliveries. The storage capacity of each of these Bay Area reservoirs is included in Table 3-1.

Prior to 2019, Calaveras Reservoir had been operating at one-third of its capacity due to restrictions imposed by the DWR Division of Safety of Dams (DSOD). The Calaveras Dam Replacement Project, which took place from 2011 to 2019, involved the construction of a new dam downstream of the then-existing dam. The DSOD restrictions on filling Calaveras Reservoir to full capacity have since been removed, and Calaveras Reservoir reached full capacity during the 2022-23 winter season when it was refilled completely in January 2023 following the dam replacement project.

In-City reservoirs and tanks collectively have the capacity to hold approximately 417 MG of water. The SFPUC estimates this capacity to be a five-day supply at the current average water consumption rate for the City. In addition, there is an emergency supply of non-potable water from Lake Merced immediately available within the City. Lake Merced currently holds approximately 1.9 billion gallons of water.

Table 3-2 summarizes the storage capacity of in-City reservoirs and storage tanks, not including Lake Merced as it is a freshwater lake used for recreation, not water supply storage.

[2] The Turlock Irrigation District and Modesto Irrigation District (Districts) have senior water rights to the City for Tuolumne River water and are provided the first increment of flow in the Upper Tuolumne River watershed according to the apportionment set forth in the Raker Act of 1913 (38 Stat. 242). The water bank at Don Pedro Reservoir provides a credit and debit system, which allows the City to divert water upstream while meeting its obligations to the Districts. Through this mechanism, the SFPUC may pre-deliver the Districts' entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Districts debit the water bank.

Table 3-1. Regional Water System Storage Capacity

[Submittal Table: Not Applicable]

RWS Reservoir	Storage Capacity in Acre-Feet (AF)[a]	Storage Capacity in Billions of Gallons (BG)
Upcountry[a]		
Hetch Hetchy	360,360	117.4
Cherry[c]	273,345	89.1
Lake Eleanor	27,100	8.8
Water Bank[d]	570,000	185.7
Subtotal Upcountry	**1,230,805**	**401.1[e]**
Local		
Calaveras (Alameda)	96,670	31.5
San Antonio (Alameda)	53,266	17.4
Crystal Springs (Peninsula)[f]	68,953	22.5
San Andreas (Peninsula)[g]	18,675	6.1
Pilarcitos (Peninsula)[h]	3,125	1.0
Subtotal Local	**240,689**	**78.4[i]**
Total RWS Storage[j]	**1,471,494**	**479.5**

a Storage values are rounded to whole numbers for larger reservoirs.

b Three other regulating reservoirs are also part of the RWS: Early Intake, Priest, and Moccasin Reservoirs.

c Storage capacity shown includes flashboards, which are structures placed in a spillway to increase the capacity of a reservoir.

d The SFPUC may draw against a credit of up to 740,000 AF in storage in a water bank account in Don Pedro Reservoir; 170,000 AF of this water bank storage is only available under certain circumstances and for a limited time. For this reason, the SFPUC considers 570,000 AF as contributing to total storage for planning purposes.

e Rows above do not sum to total due to rounding.

f Crystal Springs Reservoir has a maximum storage capacity of 22.5 BG (at 294.6 feet). Based on permit conditions, the reservoir is currently operated at 286.6 feet (8 feet below capacity).

g San Andreas Reservoir has a maximum storage capacity of 6.1 BG (at 451.8 feet). Since August 2020, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams, the SFPUC has held the maximum water level at approximately 447.8 feet (4 feet below capacity).

h Pilarcitos Reservoir has a maximum storage capacity of 1.0 BG (at 696.5 feet). Since April 2025, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams, the SFPUC has held the maximum water level at approximately 681.5 feet (15 feet below capacity).

i Rows above do not sum to total due to rounding.

j For planning purposes, the total RWS storage is 1,471,494 AF. This includes 63,700 AF in dead storage (i.e., the volume in a reservoir below the lowest controllable level).

Table 3-2. In-City Potable Water System Storage Capacity

[Submittal Table: Not Applicable]

In-City Reservoir	Storage Capacity in Acre-Feet (AF)	Storage Capacity in Millions of Gallons (MG)
Sunset South	267.9	87.3
Sunset North	266.4	86.8
University Mound South	250.1	81.5
University Mound North	182.3	59.4
Sutro	96.4	31.4
Summit	43.0	14.0
College Hill	41.4	13.5
Stanford Heights	39.6	12.9
Merced Manor	29.2	9.5
Lombard	19.0	6.2
Potrero	4.0	1.3
Hunters Point	3.1	1.0
Storage Tanks	38.7	12.6
Total In-City Storage	**1,281.0[a]**	**417.4**

a Rows above do not sum to total due to rounding.

3.1.5 Other Retail Water Systems

3.1.5.1 Groundwater and Recycled Water Systems

While the RWS system is the primary supply source serving in-City retail customers, some customers also receive groundwater or recycled water. The San Francisco Water Division operates and maintains groundwater wells supplying in-City potable water reservoirs and serving irrigation and other non-potable uses (e.g., lake filling, water exhibits) at Golden Gate Park, the San Francisco Zoo, and landscaped medians along the Great Highway. More information about this groundwater supply is provided in Section 6.2.1.1.

The City's golf courses at Harding Park (which includes Fleming Golf Course) and a portion of Sharp Park use recycled water for irrigation. The North San Mateo County Sanitation District provides recycled water to Harding Park, an in-City retail customer, and Sharp Park, a suburban retail customer in Pacifica. The SFPUC neither owns nor operates either of these recycled water systems, except for a portion of the Harding Park recycled water transmission line that is within City limits, and an onsite 700,000-gallon underground storage tank and above-ground pump station at Harding Park. More information about these recycled water supplies is provided in Section 6.2.1.2.

3.1.5.2 Suburban Retail Water Systems

As discussed above, the SFPUC serves hundreds of retail customers outside the City, who are collectively referred to as suburban retail customers. These customers are generally located directly adjacent to the RWS transmission pipelines and do not form one contiguous service area. There are also two small water systems in unincorporated

Alameda County that the SFPUC operates, as permitted by the SWRCB DDW: the Castlewood Well System and the Town of Sunol domestic water system.

- **Castlewood Well System:** The SFPUC owns and operates the Pleasanton Well Field Water System[3] (Public Water System No. CA0110018, herein referred to as the Castlewood Well System), which in FY 2024-25 supplied approximately 0.22 MGD of treated (potable) groundwater to the Castlewood County Service Area (CSA), a community consisting of the Castlewood Country Club and approximately 190 homes located in unincorporated Alameda County. The Castlewood community water system itself is owned and operated by the CSA and the California Water Service Company, respectively. The SFPUC serves the Castlewood CSA through one metered connection with groundwater pumped from the Castlewood Well System. This system consists of two wells, a 3,000-gallon control tank, and a 1.0-million gallon treated water reservoir. The supply is disinfected via sodium hypochlorite injection into the transmission main between the control tank and reservoir. Water quality is monitored weekly by the SFPUC.

- **Town of Sunol Domestic Water System:** The SFPUC owns and operates the domestic water system for the Town of Sunol (Public Water System No. CA0110012), which typically serves less than 0.1 MGD to approximately 120 metered and unmetered connections in unincorporated Alameda County. These connections are primarily residential customers that receive potable water from the RWS. After RWS supply is fully treated, fluoridated, and chloraminated, the supply enters the Town of Sunol transmission pipeline downstream of Sunol Valley Mixing Manifold. The supply is then piped to a pump station at the SFPUC's Sunol Yard and pumped to two 130,000-gallon storage tanks. Water quality is overseen by the SFPUC.

3.2 RETAIL SERVICE AREA

The SFPUC's retail customers include the residents, businesses, and industries located within City limits, referred to as the in-City retail service area. Retail service is also provided to a patchwork of customers located outside the City, such as the Town of Sunol, San Francisco International Airport, Lawrence Livermore National Laboratory, and Castlewood CSA. These areas are not contiguous and are collectively referred to as the suburban retail service area. Both the in-City and suburban retail service areas are shown in Figure 3-3.

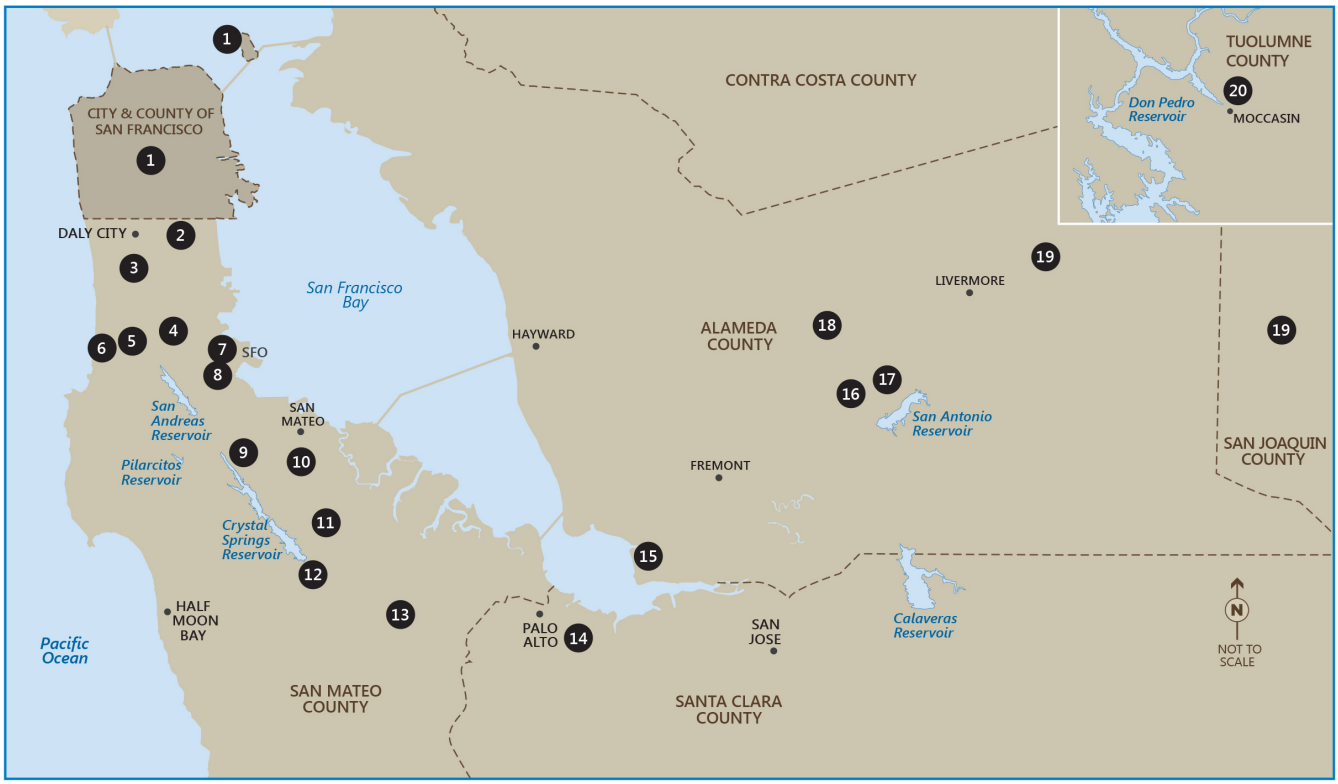
3.2.1 Climate

The San Francisco Bay Area has a Mediterranean climate where summers are cool, and winters are mild with infrequent rainfall. Temperatures average 57.8°F annually, ranging from the upper 40s in the winter to the upper 60s in the late summer. Strong onshore flow of wind in the summer keeps the air cool, generating fog through September. The warmest temperatures generally occur in September and October. Rainfall averages about 22 inches per year and is generally confined to the "wet" season from late October to early May.[4] Except for occasional light drizzles from thick marine stratus clouds, summers are nearly dry. For a discussion of climate change and potential impacts, see Section 6.1.3.

[3] The Castlewood wells are the last remnant of Spring Valley's Pleasanton well system, which were last used to export water to San Francisco for 15 months in 1948-49.

[4] Average maximum and minimum temperatures and total annual rainfall data obtained from the National Weather Service, 2000-2025 data from the downtown San Francisco station. Accessed from: **weather.gov**.

Figure 3-3. Retail Service Customers



In-City Retail Service Area

1 City and County of San Francisco

Suburban Retail Service Area

2 Residential and Non-residential Customers in Daly City

3 Cemeteries in Colma

4 Golden Gate National Cemetery

5 San Francisco County Jail #5

6 Sharp Park Golf Course

7 San Francisco International Airport

8 SFPUC Millbrae Headquarters

9 Crystal Springs Golf Course

10 Penninsula Golf and Country Club

11 Residential Customers in Redwood City

12 Filoli Center

13 Menlo Country Club

14 NASA Ames Research Center

15 Cargill Salt

16 Residential & Non-residential Customers in Sunol

17 GE Hitachi Nuclear

18 Castlewood Country Club

19 Lawrence Livermore National Laboratory (Mocho Shaft at Site 200 and Thomas Shaft at Site 300)

20 Residential & Non-residential Customers in Moccasin

The suburban customers shown above represent most of the water use in the suburban retail service area but are not comprehensive. Groveland Community Services District (CSD) is alternately characterized as a retail and wholesale customer. For the purposes of the UWMP, Groveland CSD is considered a wholesale customer.

3.2.2 Population and Demographics

As shown in Table 3-3, the total population in the retail service area is currently estimated to be 843,881 and is projected to increase to over 1.2 million by 2050. Retail population projections are included below, but retail water demands rely on projected housing and employment growth, which is how the San Francisco Planning Department reports this data. Population projections were developed by converting the Planning Department's housing projections into population. See Section 4.1 for further discussion of retail demand projections.

Table 3-3. Retail Service Area Actual and Projected Population

[Submittal Table 3-1 Retail: Population - Current and Projected]

Retail Service Area	2025 (Actual)	2030	2035	2040	2045	2050
In-City Retail[a]	842,027	1,008,333	1,063,920	1,119,800	1,174,800	1,229,800
Suburban Retail[b]	1,854	1,854	1,854	1,854	1,854	1,854
Total Retail	**843,881**	**1,010,187**	**1,065,774**	**1,121,654**	**1,176,654**	**1,231,654**

a Actual 2025 County of San Francisco population obtained from the California Department of Finance Report E-5, released May 2025. County of San Francisco population projections obtained from the San Francisco Planning Department are consistent with their 2025 memo for housing unit projections with an assumption of 2.2 people per housing unit.

b Actual and projected population is based on the number of retail residential service connections in Redwood City, Daly City, Fremont, Millbrae, and Sunol; the number of homes in Castlewood CSA; inmate population of the San Francisco County Jail #3 in San Bruno (previously Jail #5); and 2018-2023 U.S. Census data. The estimated population in the suburban retail service area was developed by multiplying the area's respective housing unit occupancy data from the U.S. Census by the number of accounts in that area. Population for Groveland CSD is not included in the suburban retail service area population but instead reported within the wholesale service area population in Table 3-4. Actual and projected population estimates previously reported in the 2020 UWMP included residential, commercial, industrial, irrigation and institutional connections. The actual and projected population estimates presented in this table only account for the residential connections within the suburban retail service area.

The retail service area, particularly the in-City portion, is highly urbanized, dense, and experiencing infill development. Open space and landscaped areas are limited, as are lot sizes. The City is almost fully built out with a few large areas under construction, such as Candlestick Point/Hunters Point Shipyard, Treasure Island/Yerba Buena Island, Mission Bay, and Pier 70. Most of these areas are located along the eastern shoreline of the City and consist of mixed-use, multi-family residential, and commercial high-rise buildings.

Housing unit estimates for San Francisco are based on San Francisco's Housing Element 2022 Update objective, which plans to add an average of 5,000 housing units per year, with adjustments for certain large developments. It is projected that the number of single-family detached houses will not increase, and it is anticipated that nearly all the new housing built in San Francisco will be multi-family buildings. Currently, the ratio of multi-family households to single family households in the City is approximately 3:1 (i.e., one-fourth of total housing is single family). As new housing is built, the SF Planning Department has assumed all new units will be multi-family. The multi-family to single-family housing ratio will increase to over 5:1 (i.e., one-sixth of total housing will be single family) by 2050.

Additional information about demographic data sources and assumptions supporting the retail demand projections can be found in Appendix C.

3.3 WHOLESALE SERVICE AREA

Under the terms of a 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA), the SFPUC sells water to 26 wholesale customers (collectively referred to as the Wholesale Customers). The SFPUC has associated individual water sales contracts with each Wholesale Customer, as well. The SFPUC also sells water to two other wholesale customers, Cordilleras MWC and Groveland CSD. These customers are further described below:

- **Wholesale Customers and BAWSCA:** Enabled by Assembly Bill (AB) 2058, BAWSCA was established on May 27, 2003 to represent the interests of 24 cities, water districts, an investor-owned utility, and a university in Alameda, Santa Clara, and San Mateo Counties that purchase water on a wholesale basis from the RWS. Since 1970, the SFPUC has supplied approximately 65% of the total Wholesale Customers' demand. Twenty-one of the Wholesale Customers rely on the RWS for more than 60% of their drinking water supply.

- **Cordilleras MWC:** Cordilleras MWC serves a community of 18 single family homes in Emerald Hills, located in unincorporated San Mateo County. It is not considered an urban water supplier as defined by CWC Section 10617. It is not a member of BAWSCA and not subject to the terms of the WSA. However, Cordilleras MWC has a water supply contract with the SFPUC for 3,007 CCF annually (about 0.006 MGD).

- **Groveland CSD:** As described in Section 2.4, Groveland CSD primarily serves residential and commercial customers in Groveland, Big Oak Flat, and Pine Mountain Lake, located in a semi-rural area of southern Tuolumne County. Although Groveland CSD is considered a retail customer of the SFPUC and is accounted as such in the SFPUC's contractual obligations and supply planning, the SFPUC has been directed by DWR to report Groveland CSD as a wholesale customer since its 2015 UWMP update and maintains this distinction in this 2025 UWMP. Therefore, Groveland CSD is included in the wholesale service area for the remainder of this section. It is not a member of BAWSCA and not subject to the terms of the WSA.

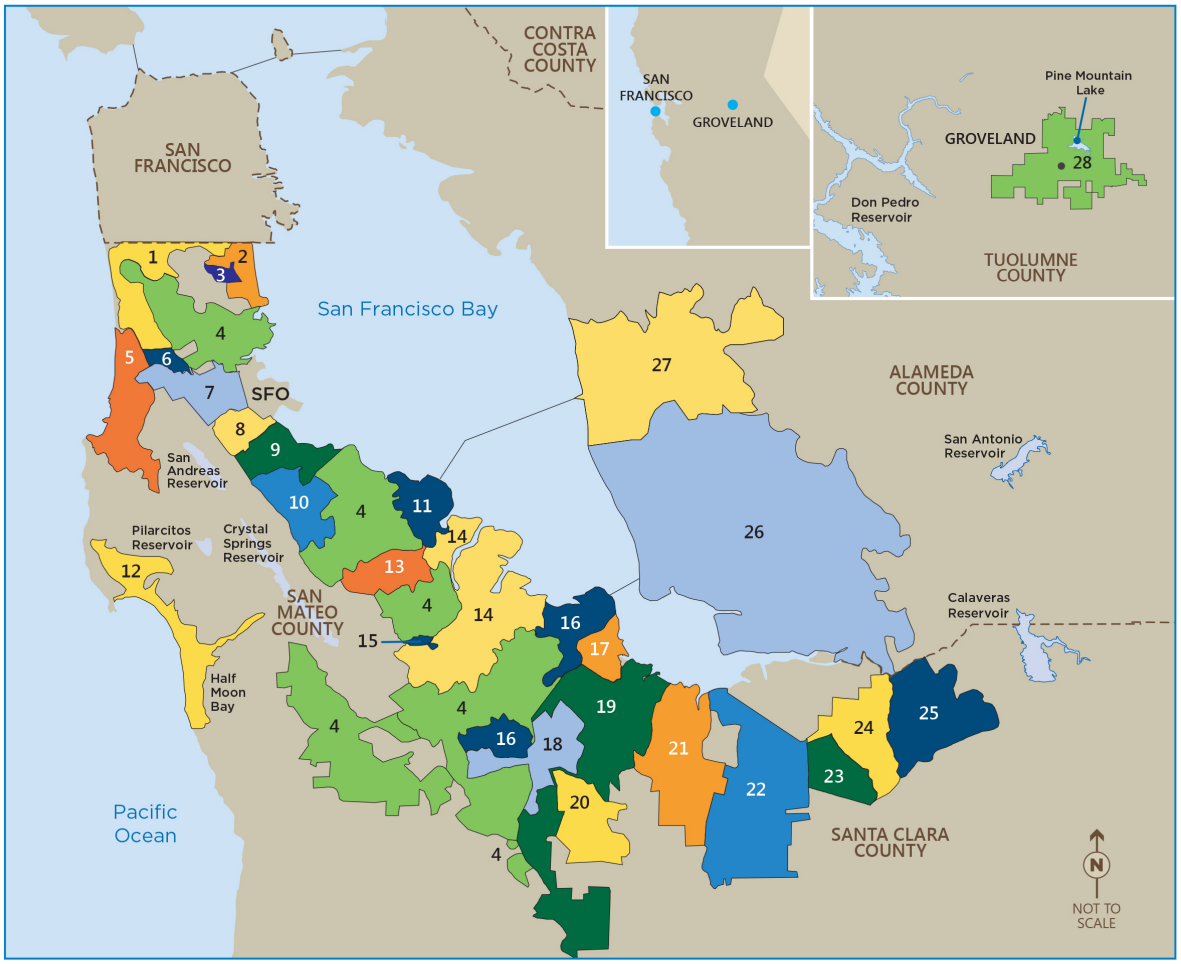
The wholesale service area encompassing the Wholesale Customers, Cordilleras MWC, and Groveland CSD is shown in Figure 3-4.

3.3.1 Climate

As described in Section 3.2.1 for the retail service area, the San Francisco Bay Area has a Mediterranean climate. Varied topography throughout the Bay Area creates numerous microclimates dependent upon elevation, proximity to the Bay or Pacific Ocean, and wind patterns. These microclimates also result in different rainfall and evapotranspiration rates. In general, the wholesale customers experience a climate like the SFPUC's customers in the in-City retail service area, except for those wholesale customers who are in the southern and inland regions of the Bay Area that tend to experience warmer temperatures in the summer months with less incidence of fog.

Further inland in the Sierra Nevada foothills, Groveland CSD experiences hot, dry summers and mild winters. Most of Groveland CSD's service area is located at elevations of 2,800 to 3,300 feet, and is not subject to the long, severe winters and heavy snowfall that are experienced at higher elevations above 5,000 feet. For a discussion of climate change and potential impacts, see Section 6.1.3.

Figure 3-4. Wholesale Service Area



MUNICIPALITIES

2	City of Brisbane	27	City of Hayward	21	City of Mountain View	24	City of San Jose[a]
9	City of Burlingame	16	City of Menlo Park	19	City of Palo Alto	23	City of Santa Clara[a]
1	City of Daly City	8	City of Millbrae	14	City of Redwood City	22	City of Sunnyvale
17	City of East Palo Alto	25	City of Milpitas	7	City of San Bruno	10	Town of Hillsborough

WATER PURVEYING DISTRICTS

26	Alameda County Water District	3	Guadalupe Valley Municipal Improvement District	20	Purissima Hills Water District
12	Coastside County Water District	13	Mid-Peninsula Water District	6	Westborough Water District
11	Estero Municipal Improvement District	5	North Coast County Water District	28	Groveland Community Services District[b]

OTHER ENTITIES

4	California Water Service Company[c]
18	Stanford University
15	Cordilleras Mutual Water Company[d]

a The SFPUC provides water on an interruptible basis to fixed service areas in the cities of San Jose and Santa Clara.

b The SFPUC reports Groveland Community Services District as a wholesale customer in its 2025 UWMP because it is an urban water supplier and prepares its own UWMP and WSCP. Outside of the UWMP and WSCP, the SFPUC considers Groveland Community Services District a retail customer in the context of allocating RWS supplies between retail and Wholesale Customers.

c California Water Service Company, an investor-owned utility, provides water service to four separate districts in the SFPUC's wholesale service area, which are consolidated into three operating districts: Bear Gulch (serving Portola Valley, Woodside, Atherton, and portions of Menlo Park, Redwood City, and San Mateo County), Mid-Peninsula (serving San Mateo and San Carlos), and South San Francisco.

d Cordilleras Mutual Water Company is not a member of BAWSCA.

3.3.2 Population and Demographics

Population projections for the wholesale service area are from three sources: BAWSCA, Cordilleras MWC, and Groveland CSD. BAWSCA's figures come from its *Regional Water Demand and Conservation Projections Study* (December 2025). Cordilleras MWC provides its own population estimates. Groveland CSD's projections rely on its 2023 *Integrated Water and Wastewater Master Plan*, which assumes a 3.44% average annual growth rate. As shown in Table 3-4, the total population in the wholesale service area is currently estimated to be about 1.9 million and is projected to increase to over 2.6 million by 2050. This corresponds to an average growth rate of about 1.2% per year.

Compared to the retail service area, the majority of which is the City and County of San Francisco, the wholesale service area is less densely populated, but still urbanized and built out. Single family homes are more prevalent, and lot sizes are larger.

Table 3-4. Wholesale Service Area Actual and Projected Population

[Submittal Table 3-1 Wholesale: Population - Current and Projected]

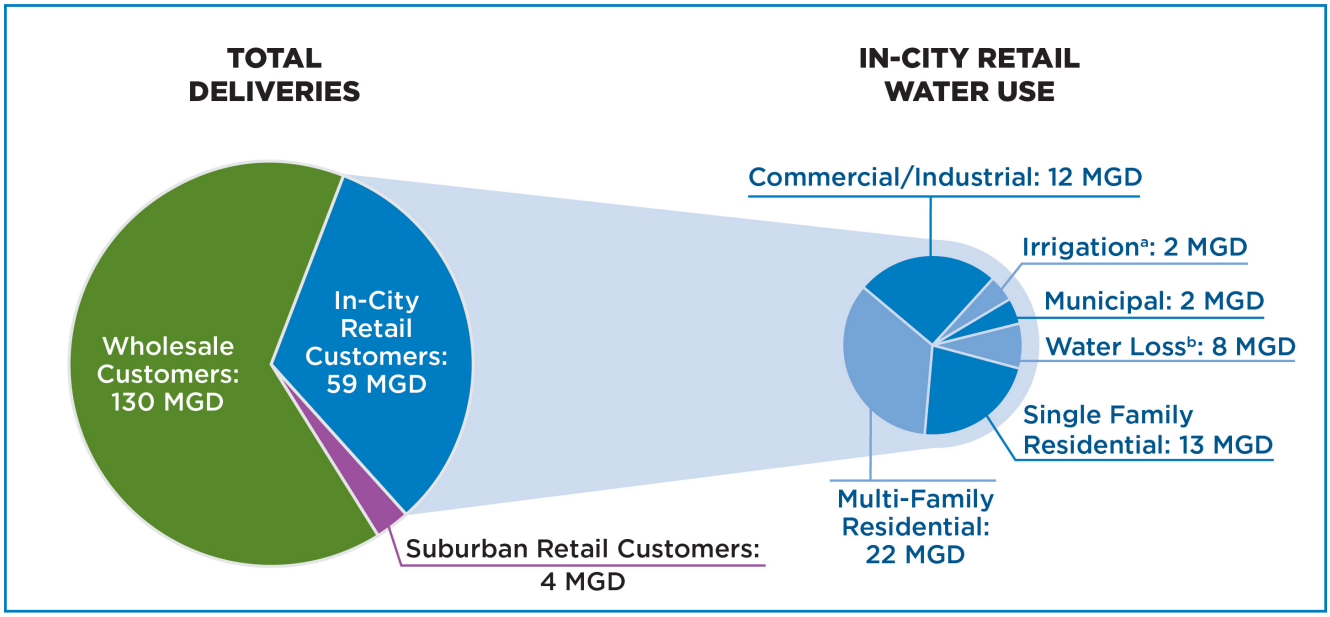
Wholesale Service Area	2025 (Actual)	2030	2035	2040	2045	2050
BAWSCA Member Agencies	1,896,180	2,048,994	2,171,693	2,303,905	2,433,408	2,595,684
Cordilleras MWC	64	64	64	64	64	64
Groveland CSD	4,144	4,907	5,810	6,880	8,146	9,646
Total Wholesale	**1,900,388**	**2,053,965**	**2,177,567**	**2,310,849**	**2,441,618**	**2,605,394**

SECTION 4: WATER DEMANDS

This section describes and quantifies the current and projected water uses within the SFPUC's retail and wholesale service areas. Retail demand projections are based on recent demographic information and a detailed analysis of water use characteristics. Wholesale demand projections for RWS supplies were developed by the Wholesale Customers. Note that the terms "use," "demand," and "consumption" are used interchangeably in this 2025 UWMP. Additionally, water loss is included in total retail demand unless otherwise noted.

As described previously, approximately two-thirds of the SFPUC's annual water deliveries are provided to wholesale customers, and the remaining one-third is delivered to the retail customers. In 2025, the SFPUC delivered approximately 191 MGD of RWS supplies to its entire water service area, with an additional 1.9 MGD in groundwater and 0.1 MGD in recycled water provided to retail customers. Figure 4-1 shows the total volumes of water delivered to wholesale customers, in-City retail customers, and suburban retail customers. Approximate water use by sectors in the in-City retail service area is also shown in Figure 4-1.

Figure 4-1. Total Deliveries and In-City Retail Water Use in 2025



a The irrigation sector includes dedicated irrigation accounts only (including local groundwater and recycled water) and does not include irrigation use from water accounts that jointly serve both indoor and outdoor demands.

b Water loss includes apparent losses (e.g., inaccuracies associated with customer billing, illegal use) and real losses (e.g., distribution system losses, main breaks). Unbilled, authorized consumption for operational uses (e.g., pipe flushing, street cleaning) has been included in the municipal category.

Groveland CSD is accounted for differently in this section of the 2025 UWMP and the corresponding submittal tables in Appendix A. This section includes Groveland CSD in the estimation of retail demands because, in the context of RWS supply allocations between the SFPUC and its Wholesale Customers, Groveland CSD is a retail customer. In contrast, the submittal tables in Appendix A include Groveland CSD in the estimation of wholesale demands, as directed by DWR and explained in Section 2.4.

4.1 RETAIL DEMANDS

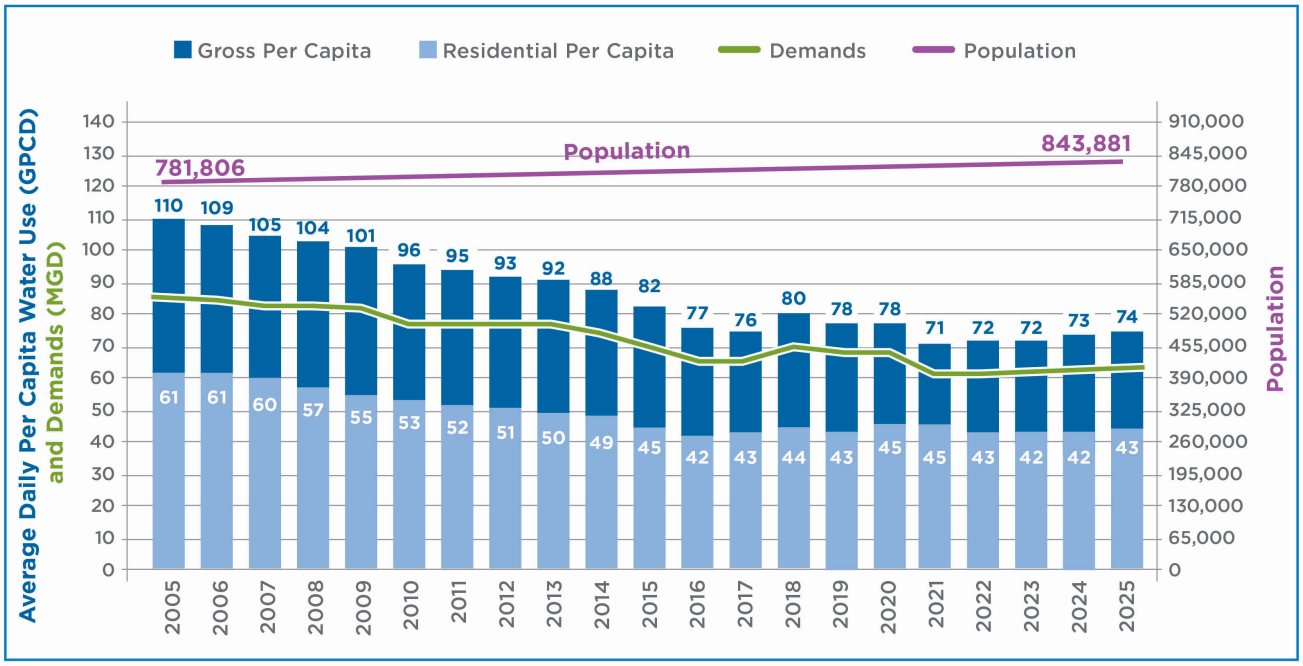
4.1.1 Current Retail Demands

Water use within San Francisco (i.e., the in-City retail service area) continues to be among the lowest in the State and below historical consumption. Both total consumption and per capita water use (i.e., gallons of water consumed per person per day [GPCD]) have been on a general decline since the mid-1970s. Many factors have contributed to this reduction in water use, including significant changes to the mix of industrial and commercial businesses and their associated water demand, and the general characteristics of water use by San Franciscans. In particular, the severe droughts of 1976-77 and 1987-92, changes in plumbing codes, and conservation programs (either voluntarily embraced by residents and businesses or mandated by the City) have affected water demands. During the drought in 2012-16, per capita water use further declined. Following the start of the COVID-19 pandemic and shelter-in-place orders issued in March 2020, retail water demands decreased by approximately 10% due to a steep decline in commercial and industrial water use.

As illustrated in Figure 4-2, daily per capita water use and deliveries for all retail customers (i.e., in-City and suburban) have declined over the past decade and have remained consistently low over the past five years. Figure 4-2 presents per capita water use on both a gross basis (i.e., water use by all sectors) and a residential basis (i.e., water use by the residential sector only). Daily gross per capita water use comes from dividing total water demand by the total population while daily residential per capita water use comes from dividing residential demand by the residential population. The residential population was estimated using total population minus group quarter population (i.e., people living in non-household settings such as correctional facilities, nursing homes, and shelters). According to current estimates from the California Department of Finance, about 3.6% of San Francisco's population lives in group quarters. In 2025, in-City retail customers' gross water use was 70 GPCD, with a residential per capita water use of 43 GPCD. Including suburban retail customers, the total gross and residential per capita water use for all retail customers are 74 and 43 GPCD. This gross per capita water use calculation divides 62.5 MGD (total water demand) by 843,881 people (as shown in Table 3-3), and the residential per capita water use is calculated by dividing 34.9 MGD by 812,841 people, which represents the in-City and suburban retail residential population. In-City residential population reflects the total population minus 3.6% for the group quarter population in San Francisco. These per capita rates are among the lowest in the State.

As an urban water supplier, the SFPUC is required to report water use data to the SWRCB in response to various emergency and permanent conservation regulations. Between 2014 and 2023, the SFPUC reported total water production and residential per capita water use monthly to the SWRCB through its former Drinking Water Drought and Conservation Reporting platform. Since 2023, the SWRCB has required urban suppliers to report similar and expanded water use data monthly and quarterly for each regulated water system. Additionally, the SWRCB's "Making Conservation a California Way of Life" regulation went into effect on January 1, 2025. Pursuant to the regulation, urban retail water suppliers are required to submit a reporting form to the SWRCB annually. The SFPUC submitted its first such report in December 2024, covering FY 2023-24 water use. SFPUC water use was below its calculated objective for that reporting period, and the SFPUC anticipates it will remain under its objective in future years.

Figure 4-2. Average Daily Per Capita Water Use, Retail Demands, and Population between 2005 and 2025



In 2025, total retail demand (including both in-City and suburban retail customers) was 62.5 MGD, which is much lower than the SFPUC retail demand anticipated in the 2015 UWMP. Of this demand, in-City retail customers used approximately 58.5 MGD (94% of total retail demand), where 1.7 MGD was met with groundwater, 0.1 MGD was met with recycled water, and the remainder was met with RWS supplies. Suburban retail customers used approximately 4 MGD (6% of total retail demand), where 0.2 MGD was met with groundwater and the remainder was met with RWS supplies. Total retail water loss, including both real and apparent losses, was estimated to be 7.2 MGD.

The SFPUC generally tracks and projects retail customer demands by each of the major sectors outlined below. Current retail demands for each of these sectors are shown alongside projected demands in Table 4-1.

- **Single Family Residential:** Single family demands represent approximately 20% of total retail demand. Due to the Bay Area's moderate climate and high-density housing, especially in the City, residential water use is primarily indoors.

- **Multi-Family Residential:** Multi-family households include apartments, condominiums, and townhouses. This sector represents approximately 36% of total retail demand. Average outdoor water use is limited since outdoor spaces for many multi-family households generally consist of patios and shared spaces, if any.

- **Commercial and Industrial:** This sector includes offices, retail businesses, restaurants, hotels, and light industrial facilities. Together, these customers account for 24% of total demand. Water use varies widely by business type, but is primarily indoors, driven by process needs.

- **Municipal:** Municipal customers include public facilities such as schools, libraries, fire stations, administrative buildings, and other City-operated buildings. This water use supports essential community

services and typically includes indoor uses. Municipal water use accounts for less than 5% of total retail demand.

- **Irrigation:** Dedicated irrigation meters are for water used exclusively for outdoor landscapes, including parks, medians, sports fields, and privately maintained green spaces. Demand in this sector is highly seasonal and influenced by weather, landscape type, and conservation practices. Irrigation accounts for less than 3% of total retail demand.

- **Water Loss and Other:** Water loss is defined as the difference between the quantity of water supplied to customers and the quantity of water consumed by customers. It includes both apparent losses (customer meter inaccuracies, unauthorized consumption, and systematic data handling errors) and real losses (water main breaks, system leakage, and storage tank overflow). For more information on water loss, see Section 4.1.4.

4.1.2 Projected Retail Demands

4.1.2.1 Methodology Used to Project Retail Demands

Beginning in 2015, the SFPUC transitioned from an end use model to an econometric model for demand projections. Econometric models incorporate socioeconomic factors to project demands and can capture a more complete demand picture. This demand projection methodology is becoming more prevalent among urban water utilities. The demand projections shown in Table 4-1 includes the following:

- **In-City Single Family, Multi-Family, and Commercial/Industrial Demands**: Econometric models are used to project the demands for these three sectors. Detailed information about these models is provided in Appendix C.
    - Active conservation savings are savings achieved through SFPUC conservation program activities, such as fixture incentives and leak alerts. The models explicitly incorporate active conservation savings. The SFPUC estimates these savings using an end-use-based water savings accounting model customized for the SFPUC from the Alliance for Water Efficiency's Water Conservation Tracking Tool. Additional information about this customized model, referred to as the SFPUC Water Conservation Tracking Model, is provided in Appendix D.
    - Passive conservation savings are savings achieved through natural fixture replacement and changes to the plumbing code over time. To avoid double-counting of passive conservation savings, the SFPUC did not subtract from the modeled demands the passive savings estimated by the SFPUC Water Conservation Tracking Model. For an excerpt of the passive savings from the Retail Conservation Plan, see Table 4-2. While it is not the SFPUC's intention or purpose in setting water rates, the SFPUC also assumes that some passive savings (e.g., per-capita water use reductions) may occur in response to changes in water rates. For example, when the volumetric component of water rates increases, people may respond by replacing inefficient fixtures to save costs or by reducing their total water consumption. Single family, multi-family, and commercial and industrial sectors all show a correlation between increasing water rates and decreasing water use. Although the SFPUC may not account for all passive savings, subtracting passive savings that the SFPUC estimated separately would likely result in a double counting of conservation savings. For

an estimate of both passive and active conservation savings, refer to the SFPUC's Retail Water Conservation Plan. The Retail Water Conservation Plan provides an overview of the retail water conservation program, the factors that shaped the program, estimated water savings, and the program's effect on the overall retail water demand projection. This plan is a key element of the SFPUC's water supply management and planning and is updated every five years to coincide with each UWMP update. The plan may be accessed online at **www.sfpuc.gov/savewater**.

    - The models incorporate savings from the Onsite Water Reuse Program, which was established by the Non-potable Water Ordinance (per Article 12C of the San Francisco Health Code) and requires developments over a certain square footage to install onsite water systems. These savings were estimated by SFPUC staff. Additional information about this estimate can be found in Section 4.1.3.

- **Irrigation, Municipal, and Suburban Retail Demands**: These demands are held constant at their 2025 actual consumption levels, the most recent data available, and are assumed to remain unchanged through 2050 because no significant growth is anticipated in these sectors.

- **Groveland CSD**: Groveland CSD provided the SFPUC with its projected demands through FY 2049-50. Demands for Groveland are projected to increase from 0.4 MGD in FY 2024-25 to 0.9 MGD in FY 2049-50, based on the anticipated level of development for this service area. As shown in the Groveland Community Services District's *Integrated Water and Wastewater Master Plan* (2023), population is estimated to double over the next twenty years.

- **Water Loss**: For planning purposes, the projected water loss estimate is based on the most recent three-year historical average and includes real and apparent losses (7.1 MGD) and authorized, unbilled water usage (0.7 MGD). For more information about water loss, see Section 4.1.4.

A key aspect of the retail demand projections starting in the 2020 UWMP is that the SFPUC calibrated the econometric models using 10 years of historical San Francisco account-level water usage data. The SFPUC combined this data with property characteristics, demographic characteristics, and historical climate data to create an econometric model that evaluates the impact of several factors on household-level demands. The SFPUC then projected demands based on the growth assumptions provided by the San Francisco Planning Department, further discussed below, along with expected future changes in rates and climate.

- **Housing Growth Projections:** The SF Planning Department updated citywide housing projections through 2050 based on the certified Housing Element 2022 Update Environmental Impact Report (Housing Element EIR) and approved Housing Element. The Housing Element EIR includes projections for 2035 and 2050. To produce the five-year incremental projections required by the California Water Code for the UWMP, the Planning Department assumed a constant, straight-line rate of housing production for 2020-2035 and 2035-2050, using 2020 existing conditions as the base year. According to the SF Planning Department's 2024 Housing Inventory (published in April 2025), the city's actual housing stock at the end of 2024 was approximately 418,000 units, which is lower than the 433,000 units shown for 2025 in the projections. The demand model uses the actual 2024 housing unit inventory estimate of 417,824 units as the number of housing units in 2025.

- **Employment Growth Projections:** The SF Planning Department's current job projections through the year 2050 are from their Land Use Allocation published in 2021, which were consistent with the projections in Plan Bay Area 2050, adopted by the Metropolitan Transportation Commission and the Association of Bay Area Governments in 2021. The commercial and industrial sector model accounts for employment distributed across a variety of sectors, such as office/professional, manufacturing, health, and education.

The demand projections for the single family, multi-family, and commercial/industrial sectors are modeled with an econometric model and were grown from a normalized base year, i.e., the FY 2024-25 demands were normalized to represent an average year. The impacts of the COVID-19 pandemic were removed and the demands were adjusted to reflect average temperature conditions. Normalizing the base year for demand projections removes the impact of idiosyncrasies that make any given year different from the average year, rather than assuming these idiosyncrasies will continue in all future years.

Separately, Groveland CSD prepared its own demand projections for its 2025 UWMP. Groveland CSD provided these projections to the SFPUC to report as part of the SFPUC's wholesale demands in the submittal tables of this UWMP update (see Appendix A). However, in the body of this UWMP, Groveland CSD's demands are included in the SFPUC's retail demands, as discussed above. The demand projections Groveland CSD reported to the SFPUC are subject to change as part of Groveland CSD's UWMP process.

4.1.2.2 Retail Demand Projections by Sector

Actual water demands for 2025 come from customer billing records. Residential demand projections, both single family and multi-family, are based on an econometric model developed for the SFPUC. Commercial and industrial projections use the same model, while municipal and irrigation demands are held constant at FY 2024-25 levels. Water losses include both apparent and real losses. The 2025 in-City retail water loss estimate comes from the validated FY 2024-25 water loss audit. Other reported uses include unbilled and unmetered water. Because the suburban retail service area has no multi-family accounts, all suburban residential demand is classified as single-family. Suburban retail losses are negligible. Groveland CSD is treated as a retail customer in this table and in later retail supply and demand comparisons. Its demand projections were provided by Groveland CSD and are based on its population projections. In Appendix A, however, Groveland CSD appears under wholesale rather than retail. Table 4-1 presents the SFPUC's updated retail demand projections by sector for 2030 through 2050. These projections show total retail demand reaching 73.4 MGD in 2050.

Table 4-1. Actual and Projected Retail Demands (MGD)

[Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water - Actual]
[Submittal Table 4-2 Retail: Total Uses for Potable and Non-Potable Water - Projected]

Retail Sector or Use Type	2025 (Actual)	2030	2035	2040	2045	2050
In-City Retail						
Single Family Residential	12.6	13.3	13.0	13.0	13.0	13.0
Multi-Family Residential	22.2	26.2	27.1	28.7	30.4	32.2
Commercial and Industrial	12.4	12.0	10.7	11.1	11.5	12.2
Municipal	2.2	2.2	2.2	2.2	2.2	2.2
Irrigation	1.5	1.5	1.5	1.5	1.5	1.5
Water Loss and Other	7.6	7.8	7.8	7.8	7.8	7.8
Subtotal In-City Retail Demand	58.5	62.9	62.3	64.3	66.3	68.9
Suburban Retail						
Single Family Residential	0.1	0.1	0.1	0.1	0.1	0.1
Commercial and Industrial	2.7	2.7	2.7	2.7	2.7	2.7
Municipal	0.8	0.8	0.8	0.8	0.8	0.8
Irrigation	0.2	0.2	0.2	0.2	0.2	0.2
Groveland CSD	0.3	0.4	0.5	0.6	0.7	0.9
Water Loss	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Suburban Retail Demand	**4.0**	**4.1**	**4.2**	**4.3**	**4.4**	**4.5**
Total Retail Demand[a]	**62.5**	**67.0**	**66.5**	**68.6**	**70.7**	**73.4**

a Rows above do not sum to total due to rounding.

Total retail demand is projected to increase by about 17%, from 62.5 MGD in 2025 to 73.4 MGD in 2050, which includes water savings from active conservation programs and the Onsite Water Reuse Program. While there is an overall increase in retail demand due to projected population and employment growth, there is an anticipated decrease in gross and residential per capita water usage across the retail service area, influenced by rate changes, temperature, and precipitation, as further detailed in Appendix C. See Figure 4-3 for a comparison of gross and residential per capita water usage from 2025 to 2050.

Both the projected demands and conservation savings reported in this 2025 UWMP are conservative, as new building codes, standards, and programs that increase water use efficiency and reduce water use will likely be implemented. A closer analysis of the estimated conservation savings is provided in the SFPUC's Retail Water Conservation Plan. Sector-specific observations are summarized below:

- **Single Family Residential:** Single family residential water use is projected to increase by 3% between 2025 and 2050. Like the demand projections in the 2020 UWMP, the demand projections in this 2025 UWMP assume no new single-family homes will be constructed in the retail service area over the planning horizon. Single family per household usage is expected to decline because of conservation savings and responses to rate increases.

- **Multi-Family Residential:** Multi-family residential water use is projected to increase by 45% between 2025 and 2050. In-City multi-family residential demands are modeled as a function of the water and sewer rates, temperature, and precipitation. Compared to single family residential demands, multi-family residential demands may be more sensitive to rate changes, but less sensitive to increases in temperature or decreases in precipitation. Multi-family households have relatively little outdoor water use.
- **Commercial and Industrial:** Commercial and industrial water use is projected to decrease by 13% between 2025 and 2035 before rebounding up to the 2025 levels by 2050. While the in-City commercial and industrial demands are directly related to the growth in employment, commercial and industrial demands are also influenced by utility rates, precipitation, and temperature.
- **Municipal, Irrigation, and Suburban Retail:** Municipal, irrigation, and suburban retail (except for Groveland CSD) water uses are projected to stay constant at their FY 2024-25 levels across the planning horizon based on historical trends. The water demand from these sectors is not as influenced by housing or employment growth compared to that of the residential and commercial sectors, and demand has varied by less than 1 MGD from year to year including during a water shortage emergency.
- **Water Loss and Other:** Water loss and other unmetered water use is projected to be a constant 7.8 MGD between 2025 and 2050 for planning purposes, based on the latest three-year historical average between FY 2022-23 and FY 2024-25 for water loss (i.e., 7.1 MGD) and other unmetered water use (0.7 MGD). More information on water loss projections is provided in the next section.

Figure 4-3. Projected Retail Demands, Population, and Per Capita Water Use

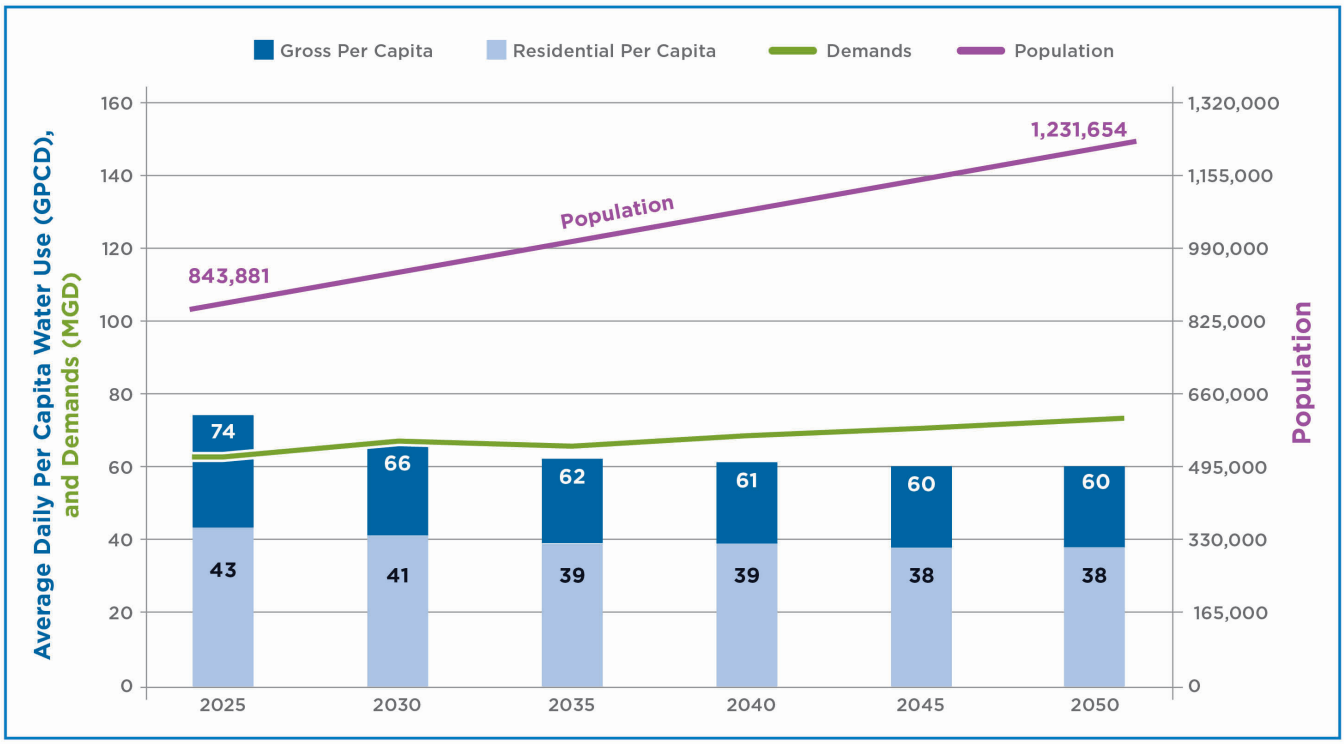


Table 4-2. Projected Passive Savings (Relative to 2025) (MGD)

Retail Sector	2025	2030	2035	2040	2045	2050
Single Family Residential	0.0	-0.4	-0.7	-1.0	-1.2	-1.3
Multi-Family Residential	0.0	-0.7	-1.2	-1.5	-1.8	-2.0
Non-Residential	0.0	-0.3	-0.4	-0.6	-0.7	-0.9
Total Passive Savings	**0.0**	**-1.4**	**-2.4**	**-3.1**	**-3.7**	**-4.1**

4.1.2.3 Additional Retail Demand Scenarios

The SFPUC recognizes that past UWMP demand projections have historically been conservatively higher than actual water use. During development of the SFPUC's 2024 AWS Plan, several public comments suggested that the SFPUC create additional retail demand scenarios and conduct a sensitivity analysis like the one in BAWSCA's *Regional Water Demand and Conservation Projections Update* (2022) for the Wholesale Customers. This recommendation was incorporated into the AWS Plan, and the SFPUC committed to developing one to two additional retail demand scenarios, including a sensitivity analysis.

A sensitivity analysis tests how changes in key assumptions affect projected outcomes. For water demand projections, it helps identify which variables have the greatest influence on future demand and shows how projections shift under different conditions. This approach improves transparency and strengthens long-term planning by highlighting uncertainty and the range of potential futures.

The SFPUC interviewed peer water agencies that also use econometric demand models, coordinated with BAWSCA on its demand study update, and reviewed BAWSCA's 2022 sensitivity analysis. The SFPUC evaluated several variables, including housing growth, employment growth, water conservation savings, SFPUC rate projections, and vacancy rates. Of these variables, housing and employment growth influenced future demand projections the most.

Using this information, the SFPUC developed two hypothetical retail demand scenarios in addition to the retail demand scenario presented in this section (i.e., the UWMP Scenario) in accordance with the Urban Water Management Planning Act. These additional scenarios differ from the UWMP Scenario because they rely on alternative housing and employment growth projections. The first additional scenario is the Historical Growth Scenario, which uses linear regressions of historical population and job estimates to project future growth. The second additional scenario is the Department of Finance and Moody's Scenario, which uses population projections from the California Department of Finance and employment projections from Moody's Corporation. These additional scenarios may inform future water supply planning for the SFPUC beyond the UWMP. Appendix C provides more detail on the sensitivity analysis and the additional retail demand scenarios.

4.1.3 Onsite Water Reuse Water Savings

This 2025 UWMP accounts for the water supply savings from buildings in San Francisco that install and operate onsite water reuse systems as a type of conservation savings. The water supplies produced by these systems are not municipally supplied by the SFPUC, and they serve to reduce demands on the SFPUC's system.

In September 2012, the City adopted the Onsite Water Reuse for Commercial, Multi-family, and Mixed Use Development Ordinance (Ordinance 195-12). Commonly known as the Non-potable Water Ordinance, this ordinance added Article 12C to the San Francisco Health Code, allowing for the collection, treatment, and use of alternate water sources for non-potable applications. The ordinance also established the SFPUC's Non-potable Water Program, since renamed the Onsite Water Reuse Program.

Since 2012, the Non-potable Water Ordinance has been amended to allow district-scale projects, where two or more parcels can share alternate water sources. In 2015, Article 12C became a mandatory requirement for new development projects that contain 250,000 square feet or more of gross floor area to install and operate an onsite water reuse system. In October 2021, Article 12C was amended to further increase potable water savings from new developments and increase opportunities for cost-effective systems. The 2021 amendments lowered the mandatory square footage threshold to 100,000 gross square feet and modified the requirements for different project types. Commercial buildings must reuse blackwater and condensate for toilet flushing and drain trap priming. Mixed-use and multi-family residential buildings must reuse graywater and condensate for toilet flushing, irrigation, clothes washing, and drain trap priming. While they are not required to install an onsite water system under Article 12C, developments between 40,000 and 100,000 square feet of gross floor area must submit water budget applications to the SFPUC.

Onsite water systems are operated, maintained, and monitored by the property owner. Under the Onsite Water Reuse Program, the San Francisco Department of Public Health-Environmental Health (SFDPH-EH) has established ongoing monitoring requirements and water quality standards that are protective of public health. Different treatment levels are required depending on the alternate water source and end use. The frequency of monitoring and reporting also varies depending on the alternate water source as identified in the San Francisco Department of Public Health's *Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems* and the operating permit for the onsite water system issued by the SFDPH-EH Branch.

In addition to projects that install mandatory onsite water reuse systems in accordance with the Non-Potable Ordinance, there are several projects that have voluntarily implemented onsite reuse. Some of these have received grants from the SFPUC via the Onsite Water Reuse Grant Program. The SFPUC also offers grant funding to breweries to collect, treat, and reuse process water (e.g., water used in the brewing process for applications such as rinsing bottles and cleaning equipment) generated onsite. The brewery grant program includes water quality, treatment, and monitoring standards for brewery process water reuse systems.

The SFPUC received two water budget applications to install onsite water systems in FY 2024-25, bringing the total number of water budget applications received and reviewed by the SFPUC since the beginning of the Onsite Water Reuse Program to 121. SFPUC staff also maintain a database of future projects that have not yet submitted water budget applications but will have to comply with the Non-Potable Water Ordinance based on their proposed gross square footage. Using existing water budget applications and the assumptions in the SFPUC's Water Use Calculator, staff have estimated the future potable offsets that will be achieved by all known onsite water reuse projects, as shown in Table 4-3. This estimate of future savings is conservative because it does not include savings from future unknown projects that are assumed in the demand projections; as these projects do not yet exist, no information about them is available to estimate the offsets from their potential onsite water reuse systems.

The SFPUC estimates that the Onsite Water Reuse Program (both mandatory and voluntary projects) will generate a total potable water offset of approximately 1.55 MGD by 2045, which will be sustained through 2050.

Table 4-3. Actual and Projected Onsite Water Reuse Program Potable Offsets (MGD)

	2025 (Actual)	2030	2035	2040	2045	2050
Onsite Water Reuse Savings	0.15	0.63	1.43	1.55	1.55	1.55

4.1.4 Retail Distribution System Water Losses

Water loss is defined as the difference between the quantity of water supplied to customers and the quantity of water consumed by customers or other authorized uses. It includes (1) apparent losses, which include inaccuracies associated with customer metering, estimated systematic data handling errors, and theft or illegal use; and (2) real losses, which include all water physically lost due to distribution system leaks, breaks, or overflows. Water loss in the retail service area ranges from 5 to 8 MGD annually.

The SFPUC conducts water loss audits of its retail water distribution system in accordance with the methods in AWWA's Manual of Water Supply Practices - M36, "Water Audits and Loss Control Programs" and Free Water Audit Software, pursuant to Section 10608.34 of the California Water Code. State law requires water loss audits to be validated and submitted annually to DWR. The results of the water loss audits from the past five years are reported in Table 4-4; these include both apparent and real losses, as calculated in the AWWA worksheet. Water loss in FY 2024-25 was determined to be 7.16 MGD, of which 5.97 MGD was attributed to real losses and 1.19 MGD was attributed to apparent losses.

Table 4-4. Retail Annual Water Losses over the Past Five Years

[Submittal Table 4-5 Retail: Water Loss Audit Reporting]

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss (MG/yr)	Volume of Water Loss (MGD)
07/2021	1,959.99	5.37
07/2022	1,875.51	5.14
07/2023	2,382.43	6.53
07/2024	2,765.66	7.58
07/2025	2,614.56	7.16

As part of the "Making Conservation a California Way of Life" regulations, SWRCB established individual system water loss standards that water suppliers should reach by 2028. The SFPUC's real water loss standard is set at 27.1 gallons per service connection per day. Compliance with this real water loss standard will be reviewed starting in 2028 based on an average of the real water losses that the SFPUC reports in the three most recent annual water audits. Based on the current three-year average, the SFPUC's losses are 32.7 gallons per service connection per day, currently above its 2028 real water loss standard. The SFPUC is undertaking ongoing operational efforts with the goal of reaching its real water loss standard.

For planning purposes, the SFPUC projects total water loss in its in-City retail service area will be 7.8 MGD through 2050. This estimate is based on a three-year historical average, which includes real and apparent losses (7.1 MGD) and authorized, unbilled water usage (0.7 MGD). This estimate reflects, among other things, anticipated leaks and water main breaks due to aging infrastructure. The SFPUC's total projection for in-City water loss is a conservative estimate and is reported as such in this 2025 UWMP.

Nearly all of the SFPUC's suburban retail customers are located immediately off of RWS transmission pipelines. Therefore, real losses in the suburban retail service area are assumed to be negligible and reported as such in this 2025 UWMP. As described in Section 3.1.5.2, the SFPUC operates the Castlewood Well System and the Town of Sunol domestic water system. However, the extent of distribution in the Castlewood Well System is limited from the well field to the control tank and reservoir; the system is not connected to the RWS. Because there is no master meter to the Town of Sunol, water loss in the Town of Sunol system cannot be directly measured. The primary source of water loss in the Town of Sunol is system maintenance flushing, which would occur regularly at a rate of 10,000 gallons per week for 50 weeks per year, or roughly 0.001 MGD. These losses in the suburban retail service area are considered to be negligible.

The SFPUC manages real losses through its Automated Water Meter Program and Linear Assets Management Program. Deployment of the Automated Water Meter Program began in 2010 as the SFPUC sought to upgrade all in-City retail water meters with wireless advanced metering technology. By 2025, the SFPUC had converted 99.5% of the meters to Advanced Metering Infrastructure. The Linear Assets Management Program replaces and renews distribution system pipelines and customer service connections for approximately 1,280 miles of drinking water mains in the City. More information about management of retail system losses is provided in Section 10.2.5.

4.1.5 Water Demands of Lower Income Households

The California Water Code requires water suppliers to include within their UWMPs projected water demands for lower income households (i.e., those with less than 80% of the area median income). This section documents the SFPUC's best effort to do so. The SFPUC does not use this estimate for any planning purposes. The demands of lower income households are included in the demand projections presented in Table 4-1.

The SFPUC estimated projected water use by lower income households by multiplying the planned future housing units for lower income residents by the estimated water use per household. This analysis, detailed below, is only performed for the in-City retail service area as lower income demands in the SFPUC's retail service area are primarily located in the City.

As described above, the demand projections presented here are based on housing growth projections from the Housing Element 2022 Update. The Housing Element 2022 Update estimates that of the 82,000 units that the City must plan for over the 2021-2031 period according to state law, 32,881 of those units are for low-income households.

Based on the water demand model, the average multi-family household is projected to use 72.1 gallons per unit per day in 2030. At this rate, the demand in 2030 for 32,881 lower income housing units is estimated to be 2.4 MGD.

This estimate of lower income water demand is reflected in the retail demand projections presented in Table 4-1. Although lower income housing growth and demands have not been analyzed separately, they have always been included in the SFPUC's retail demand projections and, subsequently, its related planning efforts.

California Government Code Section 65589.7 requires that a water utility not deny or condition water service to proposed developments that include housing units affordable to lower income households unless the water utility meets certain conditions and makes specified findings. Within the UWMP planning horizon, SFPUC anticipates there will be sufficient water supply to meet forecasted demands and serve all proposed and forecasted development projects.

Although San Francisco currently has sufficient water supply to continue to grow into its anticipated and foreseeable demand, Government Code Section 65589.7 requires municipal water agencies to develop specific objective standards for the provision of water service consistent with that section. SFPUC has developed the following standards in response to Section 65589.7:

1. In the event that SFPUC determines available retail water supplies may become insufficient to meet all present and anticipated future demands within the next five years, the Commission may direct that SFPUC prioritize available water supplies to serve proposed affordable housing developments (Affordable Housing Prioritization Order).

2. The Affordable Housing Prioritization Order will contain the following additional information:
    a. The total retail water supply available for proposed and anticipated future development projects within SFPUC's retail service area.
    b. The amount of the total available retail water supply that SFPUC determines may be necessary to serve proposed and anticipated future affordable housing developments over the next five years (Supply Reserve).

3. While an Affordable Housing Prioritization Order remains in effect:
    a. SFPUC will reserve water supplies allocated to the Supply Reserve to serve, on a first-come-first-served basis, any affordable-housing development that applies for water service.
    b. SFPUC may continue to serve water to all other proposed development types so long as sufficient water supplies remain available in excess of the Supply Reserve.
    c. While the Affordable Housing Prioritization Order remains in effect, SFPUC will periodically re-assess its water supply and demand as described in section 2, subdivisions (a) and (b), above, and revise the Supply Reserve as needed.

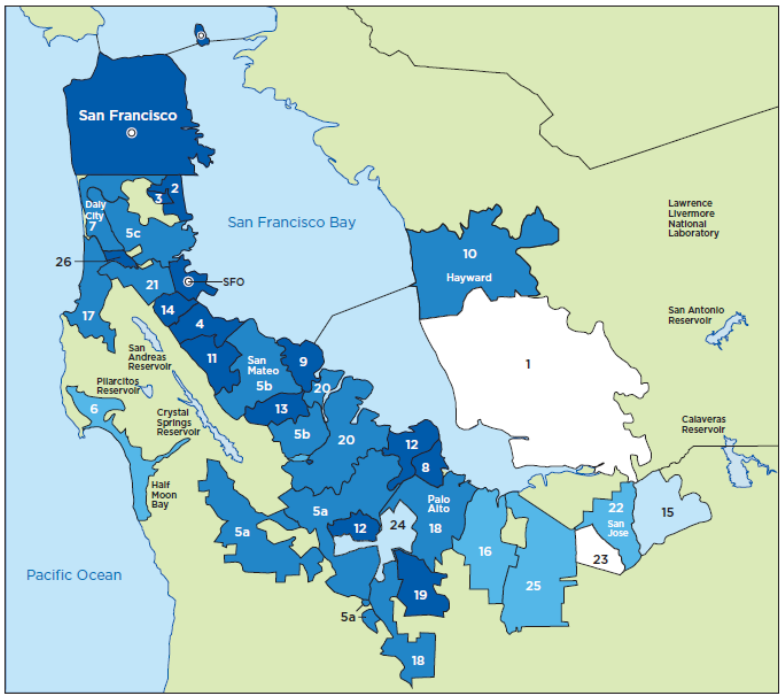
4.2 WHOLESALE DEMANDS

As noted above and discussed in further detail below, the SFPUC sells water to 26 wholesale customers (collectively referred to as the Wholesale Customers) under the terms of a contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA) and associated individual water sales contracts with each Wholesale Customer. Collectively, the Wholesale Customers receive over two-thirds of the RWS's annual deliveries, with the remaining approximately one-third provided to SFPUC's retail customers. Of the 26 Wholesale Customers, 10 rely

on the SFPUC for 100% of their total supply. The remaining 16 Wholesale Customers rely on the SFPUC for a significant portion of their supply but also use other local and imported supplies to meet their water customers' needs, including, but not limited to, local groundwater and surface water, recycled water, and in some cases, purchases from the Santa Clara Valley Water District and the State Water Project. See Figure 4-4 for a detailed map illustrating the Bay Area's reliance on the RWS, with various water suppliers shown in different shades of blue to indicate the percentage of water supply each receives from the RWS.

In addition to the 26 Wholesale Customers, the SFPUC also provides water on a wholesale basis to Cordilleras MWC in San Mateo County and Groveland CSD in Tuolumne County. Cordilleras MWC relies entirely on the SFPUC for its supply, and Groveland CSD relies on the SFPUC for much of its supply. The demands of these two additional wholesale customers are small compared to the collective demands of the other Wholesale Customers.

Figure 4-4. Bay Area Reliance on the Hetch Hetchy Regional Water System



#	District	Service Population	MGD purchased from SFPUC	% of total supply
1	Alameda County Water District	347,000	10.42	29%
2&3	City of Brisbane / Guadalupe Valley Municipal Improvement District	4,874	0.69	100%
4	City of Burlingame	32,870	3.27	100%
5a	Cal Water Service Co. / Bear Gulch			
5b	Cal Water Service Co. / Mid-Peninsula	263,270	27.97	99%
5c	Cal Water Service Co. / SSF			
6	Coastside County Water District	19,033	1.01	66%
7	City of Daly City	102,155	4.99	91%
8	East Palo Alto	29,143	1.72	100%
9	Estero Municipal Improvement District	35,556	4.03	100%
10	City of Hayward	162,954	13.66	99%
11	Town of Hillsborough	11,356	2.32	100%
12	City of Menlo Park	21,340	2.74	100%
13	Mid-Peninsula Water District	30,834	2.36	100%
14	City of Millbrae	23,000	1.85	100%
15	City of Milpitas	81,773	5.27	59%
16	City of Mountain View	84,435	7.71	83%
17	North Coast County Water District	37,370	2.43	99%
18	City of Palo Alto	67,231	9.31	98%
19	Purissima Hills Water District	6,252	1.52	100%
20	City of Redwood City	92,819	7.85	94%
21	City of San Bruno	42,054	2.71	99%
22	San Jose Municipal Water System, North	48,082	3.98	81%
23	City of Santa Clara	134,587	2.92	15%
24	Stanford University	36,867	1.59	59%
25	City of Sunnyvale	159,673	10.51	60%
26	Westborough Water District	13,486	0.68	100%
◉	City and County of San Francisco	843,071	55.00	100%

Source: BAWSCA FY 2024-25 Annual Survey;
SFPUC Water Resources Annual Report FY 2024-25

Hetch Hetchy Regional Water System
Services of the San Francisco Public Utilities Commission

4.2.1 Wholesale Water Contractual Obligations

The following section describes the water supply contracts that the SFPUC has with the Wholesale Customers.

4.2.1.1 Water Supply Agreement and Individual Water Sales Contracts

The WSA became effective on July 1, 2009, as its predecessor agreement, the 1984 Settlement Agreement and Master Water Sales Contract between the SFPUC and the Wholesale Customers (1984 Agreement), expired. The

WSA, as amended and restated in 2025, describes the current contractual relationship between the SFPUC and the Wholesale Customers.

The WSA carries forward many components of the 1984 Agreement, including the SFPUC's "Supply Assurance" of 184 MGD to the Wholesale Customers. The SFPUC has agreed to deliver water to the Wholesale Customers up to the amount of the Supply Assurance, and this agreement is perpetual and survives the expiration of the WSA. The Supply Assurance is, however, subject to reduction due to water shortage, drought, scheduled RWS maintenance activities, and emergencies.

The Supply Assurance is shared among 24 of the 26 Wholesale Customers (all Wholesale Customers which have "permanent" status, except the cities of San Jose and Santa Clara, which are "temporary, interruptible" customers as discussed in Section 4.2.1.2 below). Twenty-three of these 24 Wholesale Customers have an "Individual Supply Guarantee" (ISG), which represents their dedicated individual share of the 184 MGD Supply Assurance. The ISGs are also perpetual and survive the expiration of the WSA. The City of Hayward is the 24th Wholesale Customer that shares in the Supply Assurance, but it does not have an ISG due to the terms of its 1962 individual water supply contract with the SFPUC that did not contain a fixed allocation of water. The City of Hayward's unspecified water supply allocation is included in the Supply Assurance as the difference between 184 MGD and 161.9 MGD (the sum of the other 23 permanent Wholesale Customers' ISGs), or 22.1 MGD. If the City of Hayward's water purchases from the RWS exceed 22.1 MGD over a period of three consecutive fiscal years (an event that has not occurred to date and is not projected to occur before 2050), the 23 Wholesale Customers with ISGs would be required to reduce their individual ISGs to accommodate the demands of Hayward.

Each Wholesale Customer also has an individual water sales contract with the SFPUC that describes the service area of the customer, identifies the location and size of service connections between the RWS and the customer's distribution systems, and in some instances contains additional specific provisions unique to the customer. The individual water sales contracts may be amended from time to time by the SFPUC and the applicable Wholesale Customer pursuant to the terms of the WSA.

4.2.1.2 Interruptible Customers

As noted above, the cities of San Jose and Santa Clara are not included in the Supply Assurance, and they do not have an ISG, because the SFPUC has provided water to them on a temporary and interruptible basis under the 1984 Agreement and the WSA. While the SFPUC has never interrupted water supply to the cities of San Jose and Santa Clara, the WSA allows the SFPUC to issue a conditional notice of termination of supply if sufficient long-term water supplies from the RWS are not available. Additional discussion about the future status of these customers can be found in Section 7.3.3.

4.2.2 Wholesale Demands

Wholesale demands reached a historic low during the 2012-2016 drought and have rebounded slightly since then. A shorter drought occurred in 2020-2023, during which demands also decreased slightly to 111.3 MGD. As shown in Table 4-5, the amount of RWS supplies purchased by the SFPUC's wholesale customers in 2025 was 130.1 MGD.

In 2025, BAWSCA facilitated an update of the water demand and conservation projections for its member agencies (26 of the SFPUC's 28 wholesale customers) using a hybrid demand modeling framework that integrates: (1) an

econometric (or statistical) model developed for each member agency and (2) the Alliance for Water Efficiency Water Conservation Tracking Tool to estimate historic and future conservation. Population, housing units, and job projections used to develop the demand projections were approved by each member agency and were based on locally approved planning documents, Association of Bay Area Governments and Metropolitan Transportation Commission's Plan Bay Area 2050 growth rates, and California Department of Finance data. BAWSCA documented the demand and conservation projection methodology and results in its 2025 *Regional Water Demand and Conservation Study* (BAWSCA 2025 Demand Study). The results support BAWSCA's Long-Term Reliable Water Supply Strategy, also referred to as Strategy 2050.

In preparation for the 2025 UWMPs, BAWSCA collected RWS purchase projections from its member agencies. Collective Wholesale Customer demands for RWS supplies through 2050 are projected to be significantly less than anticipated at the time the SFPUC adopted the phased implementation of WSIP in 2008. BAWSCA's member agencies that are urban water suppliers preparing an individual 2025 UWMP are in some cases using the projections developed for the BAWSCA 2025 Demand Study, and in other cases using their own set of projections. Table 4-5 presents each Wholesale Customer's projected purchase requests for RWS supplies through 2050, as provided to the SFPUC by BAWSCA.

Regarding the SFPUC's two additional wholesale customers, the demand projections for Cordilleras MWC shown in Table 4-5 are based on the SFPUC's knowledge of the small, residential-only service area for that customer where no growth is anticipated. As noted earlier, the demand projections for Groveland CSD are presented as part of retail demands in Table 4-1 in the body of this 2025 UWMP, but as part of wholesale demands in the corresponding submittal tables in Appendix A.

Table 4-5. Wholesale Customer ISG, 2025 Purchases, and 2030-2050 Purchase Requests (MGD)

[Submittal Table 4-1 Wholesale: Total Uses for Potable and Non-Potable Water - Actual]
[Submittal Table 4-2 Wholesale: Total Uses for Potable and Non-Potable Water - Projected]

Wholesale Customer	ISG[a]	2025 (Actual)[b]	2030	2035	2040	2045	2050
Alameda County Water District	13.76	10.08	11.25	11.56	12.00	12.45	13.76
City of Brisbane / Guadalupe Valley Municipal Improvement District[c]	0.98	0.68	0.94	0.95	0.97	0.97	0.97
City of Burlingame	5.23	3.23	3.92	3.99	4.15	4.30	4.44
California Water Service Company	35.68	29.46[d]	27.04	26.89	26.93	26.80	26.89
Coastside County Water District	2.18	1.01	1.17	1.16	1.16	1.16	1.16
City of Daly City	4.29	3.55[d]	4.29	4.29	4.29	4.29	4.29
City of East Palo Alto	3.46	1.72	1.19	1.19	1.19	1.18	1.19
Estero Municipal Improvement District	5.90	3.78	3.90	3.92	3.93	3.91	3.90
City of Hayward	22.08	13.66	14.74	15.66	16.82	18.14	19.71
Town of Hillsborough	4.09	2.32	2.09	2.08	2.09	2.11	2.12
City of Menlo Park	4.46	2.72	2.58	2.64	2.71	2.76	2.83
Mid-Peninsula Water District	3.89	2.34	2.82	2.97	3.18	3.39	3.43
City of Millbrae	3.15	1.81	1.91	1.99	2.09	2.18	2.29
City of Milpitas	9.23	4.68	5.30	5.35	5.41	5.46	5.52
City of Mountain View	12.46	7.69	7.87	8.12	8.59	9.04	9.55
North Coast County Water District	3.84	2.58	2.23	2.29	2.37	2.36	2.36
City of Palo Alto	16.58	9.31	8.30	8.20	8.15	8.15	8.18
Purissima Hills Water District	1.63	1.51	1.36	1.35	1.36	1.36	1.37
City of Redwood City	10.93	7.43	6.84	6.54	6.73	6.91	7.09
City of San Bruno	3.25	1.01[d]	1.85	2.27	2.68	2.68	2.68
Stanford University	3.03	1.59	1.77	1.96	2.02	2.07	2.13
City of Sunnyvale	12.58	10.28	10.72	11.15	11.92	12.58	12.58
Westborough County Water District	1.32	0.70	0.82	0.80	0.84	0.88	0.91
Cordilleras Mutual Water Company[e]	—	0.01	0.01	0.01	0.01	0.01	0.01
Subtotal Permanent Customer Purchase Requests	184.0	123.17	124.91	127.33	131.59	135.14	139.36
City of San Jose	0.00	3.99	4.50	4.50	4.50	4.50	4.50
City of Santa Clara	0.00	2.91	4.50	4.50	4.50	4.50	4.50
Total Wholesale Purchase Requests	**—**	**130.07**	**133.93**	**136.33**	**140.58**	**144.12**	**148.36**

a Individual Supply Guarantee (ISG) refers to each Wholesale Customer's share of the Supply Assurance as defined in the Water Supply Agreement (WSA). The Supply Assurance is the 184 MGD maximum annual average metered supply of water dedicated by San Francisco to public use in the Wholesale Customer service area (not including the cities of San Jose and Santa Clara). The City of Hayward's ISG is calculated as 184 MGD minus the total of permanent customer ISGs (161.92 MGD).

b Actual demands are equivalent to purchases as reported in customer billing data.

c The City of Brisbane and Guadalupe Valley Municipal Improvement District are two Wholesale Customers that are jointly operated.

d California Water Service Company, Daly City, and San Bruno participate in the Regional Groundwater Storage and Recovery Project, and their 2025 demands include an in-lieu groundwater credit of 1.2 MGD, 1.6 MGD, and 1.7 MGD, respectively, for using surface water in place of groundwater pumping.

e Cordilleras MWC is not a member of BAWSCA or a party to the WSA and therefore does not have an ISG.

Notes: Projections were provided to the SFPUC by BAWSCA in March 2026. RWS purchase requests are reported in each agency's 2025 UWMP, if one is being prepared, and all estimates are subject to change. For the most current purchase request projections, refer to each agency's 2025 UWMP. Refer to Table 4-1 for Groveland CSD's current and projected demands. Numbers may not add up due to rounding.

4.3 CLIMATE CHANGE IMPACTS ON DEMANDS

The SFPUC's assumptions for temperature and precipitation in this 2025 UWMP are that by 2050, there will be an increase in average temperature of 0.7°C relative to 2025 and an increase in average annual precipitation of 0.13 inches per month. The retail demand model shows that retail projected demands are not significantly impacted by future changes in temperature and precipitation, likely due to the fact that irrigation demands in the SFPUC's retail service area are relatively low given the dense urban environment. For the same reason, the potential for an increase in irrigation demand due to increased temperature or decreased precipitation is low.

SECTION 5: RETAIL BASELINES AND TARGETS

The Water Conservation Act of 2009 (SB X7-7) required the State to set a goal of reducing statewide urban water use by 20% by 2020. To support this goal, each retail urban water supplier had to determine its baseline water use, expressed in gallons per capita per day (GPCD), and establish its target water use for 2015 and 2020.

In its 2010 UWMP, the SFPUC established the baseline per capita water use for its retail service area and set its 2015 interim and 2020 water use targets. The 2015 UWMP updated these values by revising the in-City retail population to reflect the 2010 U.S. Census (instead of the 2000 U.S. Census) and by including the population and water use of the suburban retail service area. In its 2020 UWMP, the SFPUC submitted its SB X7-7 Compliance Form demonstrating that it met its 2020 target. Consistent with California Water Code Section 10608.40, this section of the 2025 UWMP reports the SFPUC's progress toward the 2020 target and summarizes the 2020 analysis.

Additionally, Groveland CSD is not included in this section, as explained in Section 2.4.

5.1 GROSS PER CAPITA WATER USE BASELINES & TARGETS SUMMARY

The SFPUC calculated its retail service area's five-year baseline, 10-year baseline, 2015 interim target, and 2020 compliance target in accordance with the Water Conservation Act of 2009 and DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Act of 2009)*. Using Methodology 3, the SFPUC determined its urban water use targets and adjusted them to meet the minimum water use reduction requirement of 95% of the five-year baseline. Table 5-1 summarizes the baselines and targets calculated in the 2015 UWMP.

Table 5-1. Gross Per Capita Water Use Baselines and Targets Summary (GPCD)

Baseline Period	Start Year	End Year	Average Baseline	Interim 2015 Target	Confirmed 2020 Target
10-Year Baseline	2001	2010	107	102	96
Five-Year Baseline	2006	2010	101	—	—

5.2 COMPLIANCE WITH 2020 DAILY PER CAPITA WATER USE TARGET

The 2020 gross water use reported in this 2025 UWMP includes all water the SFPUC delivered from the RWS and groundwater sources to in-City and suburban retail customers. Gross water use in this context means water used by all sectors and water loss. The SFPUC did not deduct indirect recycled water, agricultural water use, or process water. All water sources are metered, and SFPUC staff calibrates meters on an annual basis.

The 2020 retail service area population includes both the in-City population and suburban retail populations. For the in-City retail service area, the SFPUC used population data from the California Department of Finance for the County of San Francisco. Because the suburban retail service area does not align with municipal boundaries, the SFPUC could not use the California Department of Finance data. Instead, the SFPUC estimated the population of its retail connections in Redwood City, Daly City, Fremont, Millbrae, Sunol, and Castlewood CSA by multiplying the number of customer accounts with the average household size in those respective areas using U.S. Census data.

The SFPUC consulted with DWR on this approach, and both agencies agreed it was appropriate since all suburban residential accounts are assumed to serve single-family homes, making the number of connections equivalent to the number of households.

The SFPUC calculated the base daily per capita water use by dividing the annual gross water use by population and averaging the result per day. As shown in Table 5-2, 2020 daily water use within the retail service area was 76 GPCD, well below the SFPUC's 2020 confirmed target of 96 GPCD.

Table 5-2. SB X7-7 2020 Target Compliance Summary

[Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress]

2020 Confirmed Target (GPCD)	2020 Gross Water Use (MGD)	2020 Service Area Population	2020 Daily Per Capita Water Use (GPCD)	Did the Supplier Achieve Targeted Reduction in 2020?
96	68.5	899,732	76	Yes

Since the 2020 UWMP was published, updated population and demand data for 2020 reflect demographic shifts that occurred in San Francisco between January 1 and December 31, 2020. When these updated values are applied, the recalculated 2020 daily per capita water use is approximately 78 GPCD. This difference is driven primarily by a decrease in population estimates from the California Department of Finance. For consistency with the adopted 2020 UWMP and to maintain alignment with the methodology used for SB X7-7 compliance, the City continues to report the official 2020 GPCD value as 76. The updated calculation is acknowledged here to provide transparency regarding the underlying data changes but does not alter the City's documented compliance with SB X7-7.

5.3 ASSISTANCE TO WHOLESALE CUSTOMERS

As a wholesale supplier, the SFPUC is required to provide an assessment of present and proposed SFPUC measures, programs, and policies that will help the retail water suppliers in the SFPUC's wholesale service area (i.e., its Wholesale Customers) achieve their own water-use reduction targets in compliance with SB X7-7. The SFPUC's assessment is discussed in Section 10.3.

SECTION 6: SYSTEM SUPPLIES

This section describes the water supplies the SFPUC uses to serve its retail and wholesale customers, and examines water rights, water quality, and the impacts of climate change on those supplies. It also outlines existing and future local water supplies in the retail service area that can augment and increase the long-term reliability of SFPUC supplies. As explained in Section 2.4, Groveland CSD is treated as a retail customer in this section, but as a wholesale customer in the corresponding submittal tables in Appendix A.

6.1 RWS SUPPLIES FOR RETAIL AND WHOLESALE CUSTOMERS

The SFPUC serves its retail and wholesale customers through the integrated operation of its local Bay Area water production facilities (referred to as the Peninsula System and the Alameda System) and the Hetch Hetchy System. The SFPUC operates the Peninsula and Alameda System facilities to conserve local runoff for delivery and to maintain sufficient stored water to meet RWS demands during emergencies that affect Hetch Hetchy supplies. When local runoff is insufficient, the SFPUC meets remaining demands with water diverted from the Tuolumne River through the Hetch Hetchy System. On average, the Hetch Hetchy System provides about 85% of the water the SFPUC delivers, and during dry years it can supply over 90% of the total water delivered.

The SFPUC's available water supply is constrained by hydrology, physical facilities, and institutional parameters governing the Tuolumne River allocations. Because of these constraints, the SFPUC relies on reservoir storage to maximize supply reliability. Reservoir storage also provides essential carry-over capacity: during dry years, only a small portion of the Tuolumne River supply is available to the SFPUC, and local watersheds produce very little water. Reservoir storage is therefore critical for carrying water from wet years into dry years.

As discussed in Section 7.1, the WSIP Phased Variant adopted by the Commission in 2008 limits average annual RWS deliveries from the SFPUC's watersheds to 265 MGD, with 184 MGD allocated to Wholesale Customers and 81 MGD allocated to retail customers under the Water Supply Agreement. Although the SFPUC may deliver up to 265 MGD on average each year, the supply values shown in the tables of this section and in Section 8 reflect the supplies the SFPUC projects retail and wholesale customers will use over the UWMP planning horizon. The SFPUC's Level of Service Goals and Objectives for the Water Enterprise, most recently updated in 2023, include an objective to meet an average annual demand of 265 MGD for retail and Wholesale Customers during non-drought years, consistent with the Water Supply Agreement. Appendix E provides an analysis of the SFPUC's ability to meet the Supply Assurance of 184 MGD to Wholesale Customers in normal, single dry, and multiple dry years.

6.1.1 Water Rights

The City holds both pre-1914 and post-1914 appropriative water rights to store and deliver water from the Tuolumne River and local watersheds. Appropriative water rights allow the holder to divert water from a specific source regardless of whether the place of use is contiguous to that source. These rights are primarily based on seniority, and all use must be reasonable, beneficial, and not wasteful. In 1914, California established a formal water rights permitting system through the 1913 Water Commission Act administered by the SWRCB. The SWRCB does not have permitting jurisdiction over pre-1914 appropriative water rights.

Under the Raker Act of 1913 (38 Stat. 242), Congress granted San Francisco rights-of-way to construct and operate Hetch Hetchy facilities, most of which are located on federally owned land in Yosemite National Park, Stanislaus

National Forest, as well as on federal lands managed by the Bureau of Land Management. Among other features, the Raker Act establishes conditions for releases downstream to the Turlock Irrigation District and Modesto Irrigation District (collectively, the Districts), as well as other requirements to establish access for recreational opportunities and to protect watershed conditions in the Hetchy Valley region of Yosemite National Park.

The Districts hold senior water rights to the Tuolumne River and therefore receive the first increment of flows in the Upper Tuolumne River watershed, which is why the Raker Act of 1913 allocates them the initial portion of those flows.

Separately, San Francisco has entered into a Fourth Agreement with the Districts that provides San Francisco with a water bank at Don Pedro Reservoir. The water bank provides a credit and debit system that allows the City to divert water upstream while meeting its obligations to the Districts. Through this mechanism, the SFPUC may pre-deliver the Districts' entitlements and credit the water bank, while at other times enabling the SFPUC to retain water upstream that the Raker Act allocates to the Districts to debit the water bank.

Under Section 9(c) of the Raker Act and the subsequent Fourth Agreement, the Districts are allocated the first portion of the natural flow of the Tuolumne River (up to 4,066 cubic feet per second during the spring snowmelt period between April 15 and June 13, and up to 2,416 cubic feet per second between June 13 and April 15). San Francisco is only allocated flows above these thresholds. District and City staff compute these flows daily. When the natural flow falls below the threshold values, the Raker Act does not allocate San Francisco any flow for that day. During multi-year droughts, when flows remain low, SFPUC diversions from the Tuolumne River may be limited to previously stored carryover water in system reservoirs, as well as any flows SFPUC may capture that are allocated to the Districts and that SFPUC may debit from its water bank account in Don Pedro Reservoir.

6.1.2 Water Quality of RWS Supplies

Surface water supplies available to the RWS include the Tuolumne River and local Bay Area reservoirs. Most of the water supply originates in the upper Tuolumne River watershed high in the Sierra Nevada, where the watershed is protected from development and pollution. Water from Hetch Hetchy Reservoir is conveyed to the Bay Area through a system of pipes and tunnels and requires only primary disinfection, ultraviolet light disinfection at the Tesla Treatment Facility, and pH adjustment for corrosion control.

The USEPA and SWRCB Division of Drinking Water have approved the use of this drinking water source without filtration. In contrast, water from the SFPUC's local watersheds requires filtration to meet drinking water quality standards. The SFPUC blends filtered and treated local water with water from Hetch Hetchy Reservoir, and most customers receive this blended supply. The SFPUC continuously monitors and tests both raw and treated water to ensure that water delivered to customers meets or exceeds federal and state drinking water and public health requirements. The SFPUC expects to continue relying on these high-quality water sources and does not anticipate future degradation of water quality.

Each spring, the SFPUC publishes an annual water quality report (Consumer Confidence Report), available at **www.sfpuc.gov/waterqualityreport**.

6.1.3 Climate Change Impacts on RWS Supplies

Climate change has become an important factor in water resources planning in California and is frequently considered in urban water management planning, although the extent and precise effects of climate change remain uncertain. Increasing concentrations of greenhouse gases have caused and will likely continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century, the first quarter of the 21st century, and will likely continue through the end of the 21st century. Numerous studies have been conducted to determine the potential impacts of climate change on water resources. These climate change impacts are likely to affect both the Tuolumne River watershed and local watersheds in the Bay Area and include the following:

- Reductions in the average Sierra Nevada annual snowpack due to a rise in the snowline elevation and a shallower snowpack at lower elevations, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, annual average, intensity, and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
- Sea level rise and an increase in saltwater intrusion;
- Increase in water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and a concomitant increase in irrigation need; and
- Changes in urban and agricultural water demand.

6.1.3.1 SFPUC Climate Change Study

The SFPUC views the assessment of the effects of climate change as an ongoing need that requires regular updating to reflect improvements in climate science, atmospheric/ocean modeling, observations, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined.

The SFPUC partnered with The Water Research Foundation to develop the Long Term Vulnerability Assessment (LTVA) of the RWS. The study was conducted by the University of Massachusetts Amherst Hydrosystems Research Group with input from the National Center for Atmospheric Research, other climate scientists, and Deltares. The goal of the LTVA is to help quantitatively and qualitatively assess to what extent climate change will be a threat to the RWS in comparison to, or in combination with, other external drivers of change over the next 50 years (2020-2070). The LTVA assessed the potential effects of climate change on RWS water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon. There are many uncertain factors, such as climate change, changing regulations, water quality, growth and economic cycles, that may create vulnerabilities for the RWS's ability to meet Levels of Service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system are difficult to predict but were considered in this study. To address this planning challenge, the LTVA used a vulnerability-based planning approach to explore a range of future conditions, identify

vulnerabilities, and assess associated risks that could inform a flexible adaptation plan. The LTVA was completed in 2021, and the University of Massachusetts Amherst and The Water Research Foundation amended it in 2024.

The key findings of the LTVA are:

- Climate change exacerbates impacts from other external drivers of change and is not the single most important driver of vulnerability for the RWS.
- The RWS at a baseline demand of 227 MGD is resilient to changes in climate and other external drivers.
- The RWS water supply performance declines with reductions in mean precipitation but is mostly insensitive to increases in temperature.
- The RWS is more vulnerable to changes in demand and instream flow requirements than changes in mean annual temperature and precipitation.
- The RWS is vulnerable to changes to mean climate when demand or regulatory instream flow requirements increase.

Further results and conclusions from the LTVA and its amendment are provided below:

- According to climate projections and expert elicitations, there is a central tendency of warming of +2°C and +4°C by 2040 and 2070 (Representative Concentration Pathway [RCP] 8.5), respectively, with no clear direction of change in mean annual precipitation over the planning horizon.
- In the upcountry region, by 2040, most projections and elicitations of warming estimate between +1°C and +4°C, and precipitation changes range between -5% and +5%, compared to historical baseline; and by 2070, estimates of warming range between +3°C and +6°C, and precipitation changes range between -15% and +15% (RCP8.5).
- Changes in hydrology due to climate change affect the RWS's ability to meet water supply targets. At 227 MGD baseline demand, the RWS can sustain up to +4°C and -5% precipitation change before failing to meet targets for delivery reliability, frequency of 20% rationing, storage reliability, and duration of rationing.
- Precipitation change is an important driver for RWS performance. A decrease of 10% or more will cause RWS water supply targets to be missed. The climate projections and expert elicitations show that such a change in precipitation is possible by 2040, although unlikely. The likelihood of this change increases toward 2070.
- The RWS shows minor sensitivity to temperature change for the metrics evaluated in this study. Most metrics stay above target under warming conditions. However, warming conditions often magnify the loss in system performance if precipitation or demand change.
- Demand change appears to be a major driver of future RWS performance. An increase in demand by 15% (265 MGD) will lead to failure to meet rationing frequency targets under current climate conditions. At 265 MGD demand, the rationing frequency targets would be met if there is an increase in precipitation of 10%. If demand increases by 30%, the rationing target cannot be met even when precipitation increases by 40%, which is believed plausible but unlikely over the planning horizon.
- The RWS is particularly vulnerable to the state-amended new instream flow requirements below Don Pedro Dam, which represents a huge reduction in water available. Under all demand and climate scenarios, the system reliability, defined as frequency of years without rationing, remains below 5%.

- The RWS is also vulnerable to the draft Tuolumne voluntary agreement new instream flow requirements below Don Pedro Dam, which represents a large reduction in water available, although significantly less than for the state-amended new instream flow releases. The implementation of the draft Tuolumne voluntary agreement under current climate and demand conditions would reduce the system reliability to 75%, which corresponds to the effects of a reduction in average rainfall by 20% under the current Federal Energy Regulatory Commission agreement.

6.1.4 Summary of Existing and Future RWS Supplies

As noted in Section 6.1 and discussed further in Section 7.1, the WSIP Phased Variant adopted by the Commission in 2008 limits average annual RWS deliveries from the SFPUC's watersheds to 265 MGD, with 184 MGD allocated to Wholesale Customers and 81 MGD allocated to retail customers under the Water Supply Agreement. This 2025 UWMP defines normal year RWS supplies as the supplies that the SFPUC will use to meet the full RWS demands in a normal year. Current and projected normal year RWS supplies for both retail and wholesale customers are shown in Table 6-1.

Table 6-1. Projected Regional Water System Supply Availability in Normal Years (MGD)

[Submittal Table 6-9 Retail: Water Supplies – Projected]
[Submittal Table 6-9 Wholesale: Water Supplies – Projected]

RWS Supply[a]	2030	2035	2040	2045	2050
Retail Customers[b, c]	62.7	61.2	61.9	64.0	66.7
Wholesale Customers[d, e, f]	133.9	136.3	140.6	144.1	148.4
Total RWS Supplies	**196.6**	**197.5**	**202.5**	**208.1**	**215.1**

a In the context of this document, normal year RWS supply is defined as the supply that will be used to meet the full demands on the RWS in a normal year.

b Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 MGD of RWS supply could be used in normal years.

c The SFPUC reports Groveland CSD as a wholesale customer in its 2025 UWMP, but the SFPUC otherwise considers Groveland CSD a retail customer and includes its demands (approximately 0.3 MGD) within the retail supply allocation of 81 MGD.

d Projected RWS supplies to be used by Wholesale Customers are based on the purchase request projections provided to the SFPUC by BAWSCA in March 2026. These purchase requests are subject to change in each individual agency's UWMP.

e Projected Wholesale Customer deliveries are limited to 184 MGD.

f Cordilleras MWC is a Wholesale Customer of the SFPUC but is not a party to the WSA or a BAWSCA member agency, and it is not included in the Wholesale Customer supply allocation of 184 MGD. The demands of Cordilleras MWC are minor (projected to be less than 0.01 MGD).

6.2 LOCAL SUPPLIES FOR RETAIL CUSTOMERS

The RWS provides about 97% of total retail water supplies. The remaining 3% comes from locally produced groundwater and recycled water. Onsite water reuse also produces local non-potable water that is deducted from demands and is described in this section.

6.2.1 Existing Local Supplies

Existing supplies of groundwater, recycled water, and non-potable water are described below. Future supplies are described in Section 6.2.2.

6.2.1.1 Local Groundwater and the San Francisco Groundwater Supply Project

San Francisco overlies all or part of seven unadjudicated groundwater basins: Westside, Lobos, Marina, Downtown, Islais Valley, South San Francisco, and Visitacion Valley basins. Four of these basins (Lobos, Marina, Downtown, and South San Francisco) lie entirely within City limits, while the remaining three basins extend into San Mateo County. The portion of the Westside Basin aquifer located within the City is referred to as the northern Westside Groundwater Basin. Except for the Westside and Lobos basins, most basins have limited municipal supply due to low yield, contamination, or subsidence concerns.

Historically, the City relied on local groundwater, springs, and spring-fed surface water. After imports of water from Hetch Hetchy Reservoir began in October 1934, water supply shifted almost entirely to surface water. Local groundwater use has continued in both the City and the suburban retail service area. By 2040, the SFPUC plans to increase groundwater production in San Francisco to an average of 4.0 MGD for municipal use and discontinue about 1.5 MGD of groundwater pumping used for park irrigation.

Westside Groundwater Basin. The Westside Groundwater Basin spans roughly 40 square miles across San Francisco and San Mateo counties and supports both irrigation and municipal uses. The Westside Groundwater Basin contains three aquifer zones: the Shallow Aquifer, Primary Production Aquifer, and Deep Aquifer, which have not been adjudicated or identified as overdrafted. The basin is divided administratively into northern and southern portions at the county line, though no geologic feature restricts groundwater flow between them.

Within San Mateo County, the southern Westside Groundwater Basin encompasses 25 square miles and extends southeast across the San Francisco Peninsula south of San Bruno Mountain from the ocean near Daly City to San Francisco Bay in Burlingame. It is described in the South Westside Basin Groundwater Management Plan.[5] Municipal water demand within the southern Westside Basin is served by the City of San Bruno, California Water Service Company, City of Daly City, and the SFPUC as a wholesaler to those three entities.

The northern Westside Basin has a land surface area of 15 square miles encompassing much of the western third of the City, including Lake Merced and most of Golden Gate Park. The northern Westside Basin is largely residential, with residential and commercial land uses accounting for about 75% of its area, including the Sunset and Parkside districts; and at least 25% park and open space, most notably Golden Gate Park, Lake Merced, golf clubs, and hilltop parks along the basin's eastern boundary. The northern Westside Basin land surface extends from sea level along Ocean Beach to nearly 1,000 feet above sea level along a bedrock ridge three to four miles inland. The

[5] City of San Bruno, California Water Service Company, Daly City, and Hetch Hetchy Regional Water System. July 2012. *South Westside Basin Groundwater Management Plan*.

northern Westside Basin is bounded on the north by a mostly buried bedrock ridge extending from Point Lobos southeast to Strawberry Hill in Golden Gate Park and from the park northeast to Lone Mountain. The eastern basin boundary encompasses the panhandle of Golden Gate Park, and extends south-southwest through Twin Peaks and Mount Davidson, crossing south into San Mateo County a little more than a mile east of Lake Merced. The San Andreas and Serra faults bound the basin on the west and southwest. The SFPUC has the capacity to pump up to 4 MGD of groundwater from the northern Westside Basin for municipal use.

The SFPUC leads the basin-wide Westside Basin Groundwater Monitoring Program, providing information summarizing groundwater pumping, groundwater levels, and groundwater quality, along with Lake Merced water elevations. This program publishes an annual monitoring report, which may be accessed at **www.sfpuc.gov/programs/water-supply/groundwater**. Monitoring in the northern Westside Basin is accomplished by wells constructed in either single, nested, or clustered configurations at approximately 21 locations. Groundwater levels in all wells are measured quarterly by hand and supplemented by continuous monitoring using pressure transducers at select locations. Based on regular groundwater monitoring conducted in the northern Westside Basin since 2004, static groundwater levels along the Pacific Coast and north of Lake Merced have generally remained above sea level in the Shallow and Primary Production Aquifers. The SFPUC continues to monitor water levels and conducts semiannual groundwater quality sampling at sentinel monitoring wells within the basin, providing data that assist the ongoing evaluation of potential seawater intrusion.

The SFPUC samples groundwater semiannually at 13 monitoring wells, including well locations in Golden Gate Park, coastal wells in the vicinity of the Great Highway, lake-aquifer monitoring wells in the vicinity of Lake Merced, and one well at the West Sunset Playground. The monitored parameters include total alkalinity, calcium, magnesium, sodium, potassium, bicarbonate, hardness, chloride, nitrate, sulfate, total dissolved solids, pH, and specific conductance.

Groundwater has been pumped in Golden Gate Park since 1872 and at the San Francisco Zoo since the 1930s. Based on flow meter data, these wells produce about 1.5 MGD annually for irrigation at Golden Gate Park, irrigation of landscaped medians along the Lower Great Highway, and other non-potable uses by the San Francisco Recreation and Parks Department.

The San Francisco Groundwater Supply Project (SFGW) constructed or rehabilitated six groundwater supply wells and their associated pump stations, and more than five miles of pipelines to distribute groundwater to in-City reservoirs for blending with the municipal drinking water supply. Construction began in 2014 and was completed in 2020. These wells pump groundwater from 120 to 460 feet below ground within the San Francisco portion of the Westside Basin (i.e., northern Westside Basin). Before entering the in-City distribution system, the pumped groundwater is disinfected and then blended in relatively small quantities in Sunset and Sutro Reservoirs with water supplied by the RWS. During calendar year 2021, the SFGW wells supplied an average of 0.5 MGD to those reservoirs. However, since 2021, potable groundwater production has been less than 0.1 MGD due to ongoing repairs at the Lake Merced well and the Sunset Supply transmission pipeline, as well as the need for additional treatment at three of the project wells, and the delay in receiving recycled water (used to offset groundwater) for Golden Gate Park irrigation. Once the SFPUC completes the Westside Enhanced Water Recycling Project (see Section 6.2.2.1 below) and the groundwater wells in Golden Gate Park are no longer needed for irrigation, the project will add an average of up to 1 MGD to the local water system for one or more years. Over the following several years, with continued monitoring and testing, production will step up to an average of 4 MGD. Given

approximately 1.3 MGD of existing groundwater used for park irrigation, this project represents approximately 2.7 MGD of net new supply. Two of the six wells are also capable of serving as emergency drinking water supplies following an earthquake or other natural disaster, and they include filling stations for emergency water tankers.

Following the 2014 Sustainable Groundwater Management Act (SGMA), the SFPUC established itself as the Groundwater Sustainability Agency for San Francisco and completed a draft Groundwater Sustainability Plan (GSP) for the northern Westside Basin in 2016. This plan has guided the implementation of the SFGW to ensure sustainable groundwater management in the northern portion of the Basin. The plan summarizes the Basin hydrogeology and defines measurable objectives and actions for protecting groundwater yield and quality, such as avoiding saltwater intrusion, land subsidence, and impacts on interconnected surface water resources. Although DWR designated the Westside Basin and San Francisco's other groundwater basins as very low priority, meaning a GSP is not required, the SFPUC continues to manage the northern portion of the Westside Basin consistent with SGMA. Currently, the SFPUC is updating the 2016 plan and will finalize it as a Groundwater Management Plan under Assembly Bill 3030 (the Groundwater Management Act). Adherence to this plan will ensure a long-term, high-quality local water supply.

Livermore Valley Groundwater Basin. In the suburban retail service area, the SFPUC delivers about 0.3 MGD of groundwater to the Castlewood CSA from the Castlewood Well System operated by the SFPUC (this system is described in Section 3.1.5.2.). This groundwater draws from the central groundwater subbasin in the Livermore Valley Groundwater Basin. This basin is not identified as overdrafted, nor as projected to be overdrafted in the future. These wells are metered and have been in operation for several decades. The system serving Castlewood is not connected to the RWS.

Groundwater volumes pumped between 2021 and 2025 from the two sources described above are in Table 6-2.

Table 6-2. Groundwater Pumped (MGD)

[Submittal Table 6-1 Retail: Groundwater Volume Pumped]

Groundwater Source	2021	2022	2023	2024	2025
Westside Groundwater Basin[a]	1.8	1.4	1.4	1.5	1.7
Livermore Valley Groundwater Basin[b]	0.3	0.4	0.3	0.2	0.2

a Data from 2020-2024 are obtained from the 2024 Annual Groundwater Monitoring Report, Westside Basin (SFPUC, April 2025). Pumping volumes are reported on a calendar year basis, but are used to approximate fiscal year data for this table.

b This basin is the source of water for the Castlewood Well System. Pumping volumes are assumed to be equivalent to billed consumption for Castlewood CSA and are obtained from customer billing data.

6.2.1.2 Other Surface Water

The Sunol Filter Gallery (Gallery) is located adjacent to Alameda Creek in Sunol, south of the SFPUC's Sunol Pump Station. Its supplies come from subsurface flows directly connected to creek flow and are therefore classified as surface water and subject to surface water permitting. The Gallery previously provided about 0.3 MGD for irrigation at the Sunol Valley Golf Club until the course closed in January 2016, after which the SFPUC substantially reduced production. Since then, diversions from Alameda Creek have been limited to maintenance and emergency fire flow needs for the golf course property. The SFPUC is evaluating options to restore the Gallery to full operation.

6.2.1.3 Local Recycled Water

From 1932 to 1981, the McQueen Treatment Plant supplied recycled water to Golden Gate Park for irrigation and flow augmentation of its streams and lakes. Regulatory changes eventually rendered the plant non-compliant, leading to its closure in 1981 and discontinuation of recycled water in Golden Gate Park. A limited amount of recycled water is still used in the retail service area as described below.

Harding Park. The Harding Park Recycled Water Project, a partnership between the SFPUC and the North San Mateo County Sanitation District, was completed in October 2012 and provides tertiary-treated recycled water for irrigating the Harding Park and Fleming Golf Courses in San Francisco. The project replaces potable RWS water for golf course irrigation and has an average capacity of 0.23 MGD. In 2025, Harding Park received 0.107 MGD of recycled water.

Sharp Park. The Pacifica Recycled Water Project supplies recycled water to several irrigation customers in Pacifica, including a portion of the Sharp Park Golf Course, a suburban retail customer of the SFPUC. Developed in partnership between the SFPUC and North Coast County Water District, the project began delivering recycled water in 2014. In 2025, Sharp Park received about 0.013 MGD of recycled water.

Southeast Water Pollution Control Plant. The SFPUC previously provided disinfected secondary-treated recycled water from the Southeast Water Pollution Control Plant through a truck-fill station for construction and municipal uses. The facility has been offline since 2015. Construction is underway to restore service by fall 2026.

In its 2020 UWMP, the SFPUC projected 2.1 MGD of recycled water use in 2025, based on anticipated production from the Westside Enhanced Water Recycling Project and the Treasure Island Water Resource Recovery Facility (see Sections 6.2.2.1 and 6.2.2.2 below). Actual 2025 use was approximately 0.12 MGD due to project delays. Table 6-3 compares projected and actual recycled water uses.

Table 6-3. Projected and Actual Recycled Water Use for 2025 (MGD)

[Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual]

Use Type	2020 Projection for 2025	2025 Actual Use
Golf Course Irrigation[a]	0.3	0.12
Landscape Irrigation[b]	1.8	0.0

a Golf course irrigation includes Harding Park (0.107 MGD) and Fleming and Sharp Park (0.013 MGD) golf courses.

b The 2020 projection for the 2025 landscape irrigation recycled water use assumed implementation of the Westside Enhanced Water Recycling Project and the Treasure Island Water Resource Recovery Facility. Sections 6.2.2.1 and 6.2.2.2 provide updated implementation timelines for the respective recycled water projects.

6.2.1.4 Wastewater Assessment

The SFPUC's Wastewater Enterprise operates and maintains the City's sewer systems, which collect wastewater for treatment. On the mainland, San Francisco has three combined wastewater treatment facilities that treat both wastewater and stormwater: the Southeast Water Pollution Control Plant (WPCP), the Oceanside WPCP, and the North Point Wet Weather Facility (which operates only during wet weather). On Treasure Island, the Treasure Island Wastewater Treatment Plant serves a separate sanitary sewer system and treats only wastewater. Collectively, the collection and conveyance systems consist of over 1,000 miles of sewer pipes, transport and storage structures, and pump stations located throughout the City. The Southeast and Oceanside WPCPs provide secondary treatment

year-round, while the North Point Wet Weather Facility provides primary treatment during wet weather. Treated wastewater effluent is discharged to the San Francisco Bay and Pacific Ocean. The Treasure Island Wastewater Treatment Plant provides secondary treatment for domestic and commercial wastewater from Treasure Island and Yerba Buena Island, with effluent discharged to central San Francisco Bay.

The Mel Leong Treatment Plant at San Francisco International Airport (SFO) is owned and operated by SFO, an SFPUC suburban retail customer, and treats domestic and industrial wastewater generated at the airport. Effluent is discharged to the North Bayside System Unit (NBSU) force main, which conveys treated wastewater to dechlorination facilities before discharge to the lower San Francisco Bay. The NBSU is a joint powers authority that includes the cities of Burlingame, Millbrae, San Bruno, South San Francisco, and San Francisco. In 2024, SFO began constructing an Advanced Water Treatment Plant that will provide an average of 1.0 MGD of recycled water for airport uses, including toilet flushing, irrigation, cooling, industrial water processes, vehicle washing, and dust control. Planned improvements include a per- and polyfluoroalkyl substances (PFAS) treatment demonstration plant, upgrading the sequencing batch reactors to an aerobic granular sludge system for additional nutrient removal, and a new pipeline to the NBSU outfall. This project is anticipated to be completed by the end of 2027 and will offset SFO's potable water demands. Table 6-4 summarizes current wastewater volumes collected, treated, and discharged within the retail service area.

Except for SFO, estimating wastewater volumes associated with SFPUC's suburban retail customers is difficult because they are located throughout the Bay Area and are served by multiple wastewater utilities. As shown in Table 4-1, suburban retail water use in 2025 was 4.1 MGD, or about 7% of total retail customer demand. The SFPUC's suburban retail service area generates less wastewater than the in-City retail service area.

Table 6-4. Wastewater Operations within Retail Service Area for 2025

[Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2025]
[Submittal Table 6-3 Retail: Wastewater Treatment and Outcomes Within UWMP Service Area in 2025]

Wastewater Treatment Plant and Place ID Number	Wastewater Collection Agency	Collected (MGD)	Treated (Level)	Discharged (MGD)	Recycled (MGD)	Delivered to Another Entity for Additional Treatment (MGD)
Southeast WPCP, N-Point & Bayside, Place ID 256499[a,b]	City and County of San Francisco (SFPUC)	56.7	56.7 (secondary, disinfected)	52.1[c]	0	0
Oceanside WPCP, Place ID 256498[b]	City and County of San Francisco (SFPUC)	13.9	13.9 (secondary, undisinfected)	15.0[d]	0	0
Treasure Island Wastewater Treatment Plant, Place ID 266328	City and County of San Francisco (SFPUC, operator for Treasure Island Development Authority)	0.5	0.5 (secondary, disinfected)	0.5	0	0
Mel Leong Treatment Plant, Place ID 256507[e,f]	City and County of San Francisco (SFO)	1.00	1.00 (secondary, disinfected)	1.00	0	0

a The Southeast WPCP and North Point Wet Weather Facility are grouped together as one facility because they are hydraulically connected (both plants receive influent from the same collection system), and their discharges are covered by the same permit.

b At the Southeast and Oceanside WPCPs, metered effluent flows include both primary-only and secondary treated effluent (the bulk of which is secondary treated) and flows include treated combined wastewater and stormwater because the collection systems are predominantly combined systems.

c The volume discharged is less than the volume collected because a small volume of the discharged wastewater is treated to disinfected secondary-23 level and used for other purposes.

d The volume discharged is greater than the volume collected because the discharged volume includes additional plant recycle streams.

e The Mel Leong Treatment Plant is the only wastewater facility that treats and discharges wastewater generated by a suburban retail customer within the suburban retail service area. Wastewater utilities serving other suburban retail customers do not treat or dispose of wastewater within the suburban retail service area.

f Volumes of wastewater treated at and discharged from the Mel Leong Treatment Plant correspond to calendar year 2025.

6.2.2 Future Local Supplies

The SFPUC expects the existing local supplies described above to remain available in the future. However, to reliably and sustainably meet long-term retail water needs, the SFPUC is expanding and diversifying its local water supply portfolio by increasing groundwater and recycled water production. These projects reduce reliance on any single source of water and help protect against supply disruptions. The projects related to these efforts are described below, with projected volumes provided in Table 6-5. Additional water supply projects under development in the SFPUC's Alternative Water Supply Program are described in Section 7.4.

6.2.2.1 Westside Enhanced Water Recycling Project and Associated Zoo Recycled Water Project

The Westside Enhanced Water Recycling Project includes the construction of a tertiary recycled water plant and associated pipelines to replace RWS and groundwater supplies currently used to irrigate Golden Gate Park, Lincoln Park Golf Course, the San Francisco Zoo, Lower Great Highway, the Presidio Golf Course, and other landscaped areas in the Presidio. The plant is under construction at the Oceanside WPCP and will provide 1.7 MGD to meet identified irrigation demands in Golden Gate Park, Lincoln Park Golf Course, San Francisco Zoo, Lower Great Highway, and Sunset Boulevard. The project is designed to deliver up to 2 MGD on an average annual basis, with a peak capacity of 4 MGD. Recycled water deliveries are scheduled to begin in late 2027. Approximately eight miles of recycled water pipelines have been completed. Irrigation system retrofits at Golden Gate Park, the Panhandle, and Lincoln Park Golf Course are finished.

The San Francisco Zoo Recycled Water Project will construct a new recycled water pipeline along Sloat Boulevard, west of Skyline Boulevard, to deliver recycled water from the Westside Enhanced Water Recycling Project to the San Francisco Zoo. The recycled water will be used for non-potable uses such as irrigation, animal exhibit washdown, and animal pool filling. The project will also replace groundwater used for irrigation at the Lower Great Highway. The project includes modifications and new components at the existing reservoir and pump station facility at Sloat Boulevard and 43rd Avenue. The San Francisco Zoo Recycled Water Project will offset approximately 200,000 gallons per day, or 100% of the current groundwater use, which supports diversification of the SFPUC's water supply portfolio and benefits the Westside Groundwater Basin. Construction is expected to be completed by summer 2026.

Recycled water deliveries to Golden Gate Park and Lincoln Park (annual average of 1.3 MGD) are expected to begin in 2027. Deliveries to the San Francisco Zoo (annual average of 0.3 MGD) are expected to begin in late 2027, following modernization work and cross-connection testing. The SFPUC also plans to begin deliveries to the Sunset Boulevard medians (annual average of 0.1 MGD) by 2030. Future recycled water expansion may also serve landscaped areas in the Presidio.

6.2.2.2 Treasure Island Water Resource Recovery Facility Project

The Treasure Island Water Resource Recovery Facility (TIWRRF) will be constructed adjacent to the existing Treasure Island Wastewater Treatment Plant on the northeast corner of Treasure Island, on a geotechnically improved 10-acre greenfield site. The TIWRRF will provide tertiary wastewater treatment and include constructed wetlands, with an average dry-weather capacity of at least 1.3 MGD and peak wet-weather capacity of 3.9 MGD. The TIWRRF will replace aging infrastructure, ensure regulatory compliance, and meet the wastewater needs of future Treasure Island and Yerba Buena Island residents and businesses, and recycled water needs of the Treasure Island development. The City's redevelopment of Treasure Island is anticipated to add open space, hotels, restaurants, shops, entertainment venues, and up to 8,000 new homes capable of housing more than 20,000 new residents by 2036.

The TIWRRF will include liquid treatment processes, solids handling, odor control, and a wetland, and will produce disinfected tertiary effluent meeting Title 22 requirements. The Treasure Island development is expected to use an average of 0.4 MGD and a peak of 1.0 MGD of recycled water for dual plumbing in buildings, outdoor irrigation, and urban agriculture. The TIWRRF and associated wetlands align with the open space vision for the development. Construction began in September 2023 and will be completed by the end of 2026.

6.2.2.3 Other Actions to Expand Recycled Water Use

Ordinances, Programs, and Services. The SFPUC administers or helps to administer several ordinances, programs, and services in the City that expand recycled water and onsite water reuse. Many of these have been in place for several years and continue to drive long-term reductions in potable water demand.

- **Recycled Water Program and Ordinance:** The City adopted Ordinances 390-91 and 391-91, collectively referred to as the Recycled Water Ordinance, to expand recycled water use.[6] This ordinance requires dual-plumbed systems in designated areas of the City for new, remodeled, or converted buildings; subdivisions of 40,000 square feet or more; and irrigated areas of 10,000 square feet or more. As new construction and rehabilitation projects move forward, the number of dual-plumbed systems continues to grow in the City.

- **Soil Compaction and Dust Control:** In 1991, the City passed Ordinance 175-91,[7] which restricts the use of potable water for soil compaction and dust control on construction and demolition sites when reclaimed water, well water, or groundwater is available in sufficient quality and quantity within 10 miles of the site. In addition, Section E of the SFPUC Rules and Regulations Governing Water Service to Customers prohibits using potable water for backfill consolidation around non-potable piping, soil compaction, or dust control for construction or demolition projects if recycled water, well water, or groundwater are available within San Francisco.

- **Large Landscape Grant Program:** The SFPUC launched the Large Landscape Grant Program in 2009. In-City retail customers with at least 1/4 acre of irrigated landscape (reduced from the original 2.5-acre threshold when the program first started) may apply. The program funds water-saving and recycled water irrigation retrofits that reduce potable water use. The SFPUC provides technical assistance during implementation. Harding Park and Sharp Park both received grant funding for recycled water irrigation retrofits through this program.

- **Non-potable Water Program and Ordinance:** As described in Section 4.1.3, the City adopted the Non-potable Water Ordinance in 2012 to allow the collection, treatment, and use of alternate water sources for non-potable applications. The Non-potable Water Program outlines the oversight of the SFPUC, the San Francisco Department of Public Health-Environmental Health, and the San Francisco Department of Building Inspection during the review process. The City amended the ordinance in 2015 to require onsite water systems in new developments that meet specified criteria. Under the most recent amendments, adopted in October 2021, new development projects of 100,000 gross square feet or more that apply for a site permit after January 1, 2022, must install and operate an onsite water reuse system. Required alternate water sources and required non-potable uses vary by project type. For commercial buildings, the project must meet its toilet and urinal flushing and drain trap priming demands using treated blackwater and condensate (water vapor collected from air conditioning systems). For residential and mixed-use buildings, the project must meet its toilet and urinal flushing, irrigation, clothes washing, and drain trap priming demands using treated graywater and condensate. These requirements apply to both single building and multiple building developments. The 2021 amendments exempt 100% homeless supportive housing and

[6] San Francisco Public Works Code, Article 22, Sections 1200-1210. Note that this ordinance was amended in 1994 by Ordinance 393-94, which expanded the designated recycled water use area to include Treasure Island, Yerba Buena Island, and Hunters Point Shipyard.
[7] San Francisco Public Works Code, Article 21, Sections 1100-1107.

100% affordable housing to reduce barriers to construction and address water affordability challenges. However, thoughtfully designed onsite water reuse systems can deliver financial savings to residents, owners, and municipalities, while also providing broader quality-of-life benefits. San Francisco continues to explore ways to expand onsite reuse and ensure all communities have equitable access to these benefits.

- **Public Outreach:** The SFPUC actively promotes programs that conserve, diversify, and supplement RWS supplies. Staff develop and distribute outreach campaigns, fact sheets, and articles to media outlets, customers, and public officials.

Projects and Partnerships. As demonstrated by the Harding Park and Pacifica Recycled Water Projects, the SFPUC continues to pursue regional recycled water partnerships with Bay Area agencies. These collaborations aim to develop projects that reduce demands on RWS supplies and/or free up groundwater for potable use or basin recharge.

Research and Knowledge Sharing. The SFPUC participates in several organizations and committees that advance recycled water and water reuse, including (1) the Bay Area Clean Water Agencies (BACWA) Recycled Water Committee, (2) the national WateReuse Association and its California Section, (3) the Water Research Foundation, and (4) the California Urban Water Association water reuse committee. The SFPUC also participates in the Bay Area Regional Reliability (BARR) Partnership, where Bay Area water utilities share best practices, coordinate water resource planning, and collaborate on drought contingency measures (see Section 7.5 for more detail).

6.2.3 Water Quality of Local Supplies

Local groundwater, recycled water, and non-potable water supplies primarily support irrigation and other non-potable uses. The SFPUC works to meet or exceed state water quality standards for these end uses and works closely with regulatory agencies and partners to maintain high water quality.

6.2.3.1 Local Groundwater Quality

This section summarizes the water quality of existing and future groundwater supplies.

Westside Groundwater Basin. Beginning in the 1920s, groundwater from the Westside Groundwater Basin has supplied drinking water to Daly City, San Bruno, and South San Francisco. In 2017, the SFPUC began incorporating groundwater from the basin into the in-City drinking water supply using the SFGW project wells. The SFPUC disinfects pumped groundwater with sodium hypochlorite, adjusts pH for corrosion control, and blends the water with RWS supplies before distribution. The resulting blend meets all SWRCB DDW health-based drinking water standards.

As described in Section 6.2.1.1, the SFPUC manages the Westside Basin Groundwater Monitoring Program, which includes water quality sampling from 85 wells to provide early warning for potential saltwater intrusion and other potential sources of contamination. The SFPUC will continue monitoring these wells and expand the network as needed to evaluate basin response to SFGW and related operations.

Castlewood Well System. The SFPUC disinfects groundwater supplies from the Castlewood Well System using sodium hypochlorite injection. The water is potable when delivered to Castlewood CSA, and the SFPUC monitors water quality weekly.

6.2.3.2 Local Recycled Water Quality

This subsection describes the water quality of existing and future recycled water supplies.

Harding Park. The North San Mateo County Sanitation District produces tertiary-treated recycled water at its treatment plant in Daly City for irrigation at the Harding Park and Fleming Golf Courses. This water meets Title 22 requirements for approved non-potable uses.

Sharp Park. The City of Pacifica's Calera Creek Water Recycling Plant produces tertiary-treated recycled water, delivered by the North Coast County Water District, for irrigation at portions of the Sharp Park Golf Course. This water also meets Title 22 requirements for approved non-potable uses.

Westside Enhanced Water Recycling Project. The SFPUC's Westside Enhanced Water Recycling Project will produce tertiary-treated recycled water followed by reverse osmosis and ultraviolet disinfection. The resulting water will meet Title 22 requirements and irrigate Golden Gate Park, Lincoln Park Golf Course, the Presidio Golf Course, and other landscaped areas in the Presidio.

6.2.4 Climate Change Impacts on Local Supplies

The SFPUC's primary concern related to climate change is the potential impact on RWS supplies, as discussed in Section 6.1.3. Implementation of the Groundwater Sustainability Plan for the northern Westside Basin will help maintain in-City groundwater supplies for current and future uses. Recycled water remains a drought-resistant supply that is not affected by precipitation or hydrologic year type.

6.2.5 Summary of Existing and Future Local Supplies

Table 6-5 summarizes the SFPUC's current and projected water supply sources for meeting retail demand through 2050. Up to 81 MGD of RWS supplies are available to retail customers in normal years. The SFPUC also remains committed to expanding local supplies, such as groundwater and recycled water, to supplement RWS supplies and meet future retail demands.

Table 6-5. Actual and Projected Retail Supplies (MGD)

[Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area]
[Submittal Table 6-8 Retail: Water Supplies – Actual]
[Submittal Table 6-9 Retail: Water Supplies – Projected]

Retail Supply	2025 (Actual)	2030	2035	2040	2045	2050
RWS Supply Utilized by Retail Customers[a]	60.5	62.7	61.2	61.9	64.0	66.7
Groundwater						
In-City Potable[b]	0.1	1.5	3.0	4.0	4.0	4.0
In-City Irrigation[b,c]	1.6	0.5	0.0	0.0	0.0	0.0
Castlewood Well System[d]	0.2	0.3	0.3	0.3	0.3	0.3
Subtotal Groundwater	**1.9**	**2.3**	**3.3**	**4.3**	**4.3**	**4.3**
Recycled Water						
Westside Enhanced Water Recycling Project[e]	—	1.7	1.7	1.7	1.7	1.7
Harding Park Recycled Water Project[f]	0.1	0.2	0.2	0.2	0.2	0.2
Sharp Park Recycled Water Project[g]	0.01	0.1	0.1	0.1	0.1	0.1
Treasure Island Water Resource Recovery Facility Project[h]	0.0	0.04	0.04	0.4	0.4	0.4
Subtotal Recycled Water	**0.1**	**2.0**	**2.0**	**2.4**	**2.4**	**2.4**
Total Retail Supply	**62.5**	**67.0**	**66.5**	**68.6**	**70.7**	**73.4**

a If the retail supply allocation remains 81 MGD through 2050, up to 81 MGD of RWS supply may be used.

b The San Francisco Groundwater Supply Project will ramp up potable water production from 1.5 MGD in 2029 to 4 MGD by 2040. About 1.5 MGD of groundwater currently serves irrigation at Golden Gate Park, the San Francisco Zoo, and the Great Highway medians. This 1.5 MGD of groundwater will be converted to potable supply under the San Francisco Groundwater Supply Project.

c Groundwater use for in-City irrigation will be phased out once the Westside Enhanced Water Recycling Project comes online.

d Castlewood CSA is served by the Castlewood Well System.

e The Westside Enhanced Water Recycling Project will supply Golden Gate Park (1.2 MGD), Lincoln Park (0.1 MGD), SF Zoo and the Lower Great Highway (0.28 MGD) by 2027, and Sunset Boulevard (0.1 MGD) by 2030.

f Irrigation at Harding Park and Fleming Golf Courses receives recycled water from the North San Mateo County Sanitation District. Harding Park used approximately 0.107 MGD of recycled water in 2025.

g Irrigation at Sharp Park Golf Course is provided with recycled water from the North Coast County Water District. The Sharp Park Recycled Water Project provided approximately 0.013 MGD of recycled water in 2025.

h Recycled water production at the Treasure Island Water Resource Recovery Facility is scheduled to start in 2026 with an initial output of approximately 0.04 MGD. However, the full delivery infrastructure will not be in place at that time; the facility is expected to reach its full capacity of 0.43 MGD by 2037.

6.3 ENERGY INTENSITY ANALYSIS

In accordance with Section 10631.2(a) of the California Water Code, this section and Appendix A provide energy intensity data for FY 2024-25 for the RWS.

Because of the design of the SFPUC's water delivery system, the SFPUC cannot separate energy intensity data for retail and wholesale water deliveries. Instead, the SFPUC uses the Total Utility Approach to report system-wide energy intensity information, as detailed further in Appendix A. The SFPUC also does not have access to the Wholesale Customers' electricity meter records for the electricity that they use to distribute purchased water within their service areas, so that information is not included in the energy intensity analysis. In addition, the SFPUC's energy intensity analysis excludes electricity consumed by other entities to produce recycled water delivered to SFPUC customers.

The reported energy consumption includes the associated hydropower generated by the Hetch Hetchy Water and Power Project as a result of water deliveries through the RWS. The RWS is almost entirely gravity-driven from Sierra Nevada reservoirs to the Bay Area, and no electricity is used for pumping at Wholesale Customer turnouts. Electricity use in the SFPUC's analysis primarily reflects pumping water supplies to off-stream storage in the Bay Area, in-City pumping for distribution, and electricity consumed at the Sunol and Harry Tracy Water Treatment Plants. It also includes electricity used at administrative and support facilities.

The Hetch Hetchy Regional Power System consists of four hydroelectric powerhouses (Moccasin Powerhouse, Moccasin Low Head Powerhouse, Kirkwood Powerhouse, and Holm Powerhouse), which account for a combined hydroelectric generating capacity of nearly 400 megawatts.

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SECTION 7: WATER SUPPLY RELIABILITY

This section describes how reliably the RWS and local supplies can meet retail and wholesale demands through 2050. The SFPUC delivers approximately one-third of the RWS's annual supplies to retail customers and the remaining two-thirds to wholesale customers. RWS reliability reflects the system's ability to deliver water during water shortage emergencies and is measured by how often and how much deliveries must be reduced to balance demand with available supply. The SFPUC plans for the possibility of a water shortage emergency more severe than the worst drought on record. This section also outlines the nearly completed Water System Improvement Program (WSIP), the factors currently affecting supply reliability, and the SFPUC's Alternative Water Supply Program, which aims to address potential supply shortfalls.

7.1 WATER SYSTEM IMPROVEMENT PROGRAM

Initiated in 2008, WSIP is a $4.8 billion multi-year capital program to upgrade the RWS as well as the SFPUC's local water system. The program has delivered capital improvements that enhance the SFPUC's ability to provide reliable, affordable, high-quality drinking water in an environmentally sustainable manner to its retail and wholesale customers. The SFPUC structured WSIP to cost-effectively meet water quality requirements, improve seismic and delivery reliability goals through the year 2030, and fulfill water supply objectives through the year 2018. The SFPUC completed the San Francisco portion of WSIP in October 2020. As of June 30, 2025, the regional portion of WSIP was 99.3% complete, having repaired, replaced, and seismically upgraded crucial portions of the RWS; only two regional projects remain in planning and construction, while 49 regional projects have been completed or are in close-out. The SFPUC forecasts that the overall WSIP will be completed in June 2032.

The SFPUC undertook the WSIP to ensure the ability of the RWS to meet Level of Service (LOS) Goals and Objectives for water quality, seismic reliability, delivery reliability, and water supply. The Water Supply LOS goal, stated in the WSIP and adopted in 2008, is to meet customer water needs in non-drought and drought periods. The SFPUC amended and updated the LOS Goals and Objectives in November 2023. The SFPUC's current LOS Goals and Objectives related to water supply include the following:

- Meet an average annual water demand of 265 MGD from the SFPUC watersheds for retail and Wholesale Customers during non-drought years consistent with the Water Supply Agreement between San Francisco and its Wholesale Customers in Alameda, San Mateo, and Santa Clara Counties.
- Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts.
- Diversify and improve use of new water sources and drought management, including groundwater, recycled water, conservation, transfers, storage expansion, purified water, desalinated water, and technological innovations that can increase supply and/or water use efficiency.
- Maintain San Francisco retail residential potable water use below 45 gallons per capita per day.
- Realize annual Real Water Losses of less than 10% of water supplied to San Francisco.

- Meet 80% of San Francisco's Recreation and Parks Department irrigation demands with recycled water by December 31, 2025.

7.2 WSIP DRY-YEAR WATER SUPPLY PROJECTS

With WSIP, the SFPUC has undertaken several water supply projects to meet dry-year demands. Those projects include the following:

Calaveras Dam Replacement Project. Calaveras Dam is in the East Bay near a seismically active fault zone, and following the Loma Prieta earthquake in 1989, it was determined to be seismically vulnerable. To address the dam's vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. This project was completed in 2022. Calaveras Reservoir was completely refilled in 2023 and is now operating at full capacity.

Alameda Creek Recapture Project. The Alameda Creek Recapture Project includes new facilities in and around an existing quarry pit in Sunol Valley to recover water supply loss associated with instream flow release and bypass requirements related to the Calaveras Dam Replacement Project. The project is anticipated to be completed in 2032.

Lower Crystal Springs Dam Improvements Project. The Lower Crystal Springs Dam Improvements Project was completed in May 2012. The related joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the Lower Crystal Springs Dam was completed in January 2019.

Regional Groundwater Storage and Recovery Project. The Regional Groundwater Storage and Recovery (RGSR) Project is a strategic partnership between the SFPUC and three Wholesale Customers in San Mateo County: the California Water Service Company (serving South San Francisco and Colma), the City of Daly City, and the City of San Bruno. The project sustainably manages groundwater and surface water resources to provide the RWS with additional supplies during times of drought. During years of normal or heavy rainfall, the SFPUC provides additional surface water from the RWS to the three agencies in northern San Mateo County, allowing them to reduce the amount of groundwater that they pump from the southern Westside Groundwater Basin. Over time, the reduced pumping allows the aquifer to naturally recharge, resulting in increased groundwater storage of up to 61,000 acre-feet of new water supply available during dry years. As of December 2025, the SFPUC had accumulated approximately 14 billion gallons of groundwater storage credits (about 43,093 acre-feet) through the project.

The RGSR project has two phases. Phase 1, which included building thirteen production wells and treatment facilities, is complete. Phase 2 design began in early 2020 and covers rehabilitating and reinstalling well pumps, installing two new variable frequency drives, and conducting start-up testing and well disinfection. Pumps at the Hickey, Southwood Drive, and Mission well were rehabilitated, packed, and stored due to staff shortages, operational challenges, and elevated ammonia levels at the Southwood Drive well; they may be reinstalled later. Construction on Phase 2B began in 2024 and will transport groundwater from SFPUC South San Francisco Main Well to the California Water Service Company Treatment Station in South San Francisco. The project will make improvements at the existing well site, which includes mechanical, electrical, structural, and corrosion protection upgrades. The SFPUC also prepared a conceptual engineering design for additional groundwater treatment to

address the high ammonia levels at the South Spruce Lane Well and Treatment Facility. Minor amounts of groundwater pumping from RGSR wells have occurred during start-up testing and monthly maintenance.

Regional Groundwater Treatment Improvements Project. The SFPUC approved this new project in the 10-Year Water Enterprise Capital Improvement Program for FY 2021-2030. The project includes treatment facilities for several of the RGSR project wells to address groundwater quality issues that have emerged since the wells were constructed.

Water Transfers. During the planning and phased implementation of the WSIP, the SFPUC pursued a long-term agreement to transfer 2 MGD from Modesto Irrigation District to the SFPUC in drought years. Negotiations with Modesto Irrigation District ended in 2012 when an agreement could not be reached. The dry-year transfer project is now being included as part of the new SFPUC Alternative Water Supply Program and is described in further detail in Section 7.4.

7.3 FACTORS AFFECTING FUTURE RWS SUPPLIES

There are several factors that may impact future RWS supplies; these factors are described below.

7.3.1 Adoption of the 2018 Bay-Delta Plan Amendment

In December 2018, the SWRCB adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives for the San Francisco Bay-Delta watershed. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the San Francisco Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[8] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this 2025 UWMP in normal years but is expected to experience supply shortages in single dry years or multiple dry years. Implementation of the Bay-Delta Plan Amendment could require rationing in all single dry years and multiple dry years.

Implementation of the Bay-Delta Plan Amendment remains uncertain for multiple reasons.

- Over a dozen lawsuits have been filed in both state and federal courts challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is currently at the appellate level.

- The Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to San Francisco or any other water rights holders. Rather, the Bay-Delta Plan Amendment provides a regulatory framework for implementing water quality objectives, which

[8] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at **https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf**.)

the SWRCB must implement by subsequent proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, potentially through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and any other adjudicatory proceedings may face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the RWS).

In recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB in Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River," and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." On March 26, 2019, the SFPUC adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. On November 10, 2022, the SFPUC along with the Modesto and Turlock Irrigation Districts signed a Memorandum of Understanding Advancing the Term Sheet for the Voluntary Agreements to Update and Implement the Bay-Delta Water Quality Control Plan and Other Actions. The Voluntary Agreements are now referred to as the Agreements to Support Healthy Rivers and Landscapes (HRL). The SWRCB is in the process of evaluating the Healthy Rivers and Landscapes Program. Specifically, in the fall of 2025, the SWRCB released a draft Scientific Basis Report for the Tuolumne HRL, which evaluated the biological benefits of the proposal. The SWRCB also released a Notice of Preparation for the CEQA analysis of the Tuolumne HRL in spring of 2023.

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the water supply reliability assessment presented in the 2025 UWMP looks at two future supply scenarios: (1) implementation of the Bay-Delta Plan Amendment and (2) the SFPUC system's current conditions without implementation of the Bay-Delta Plan Amendment.

7.3.2 Potential State and Federal Regulations

The SFPUC's operation of the RWS is subject to numerous State and federal agency permits designed to protect drinking water quality and the environment. Some permit requirements have been in place for decades and influence the way the SFPUC manages water supply. Requirements for instream flows, for example, may increase the releases or bypass flow from SFPUC facilities. In the Tuolumne River watershed, the SFPUC currently maintains a specific flow release schedule downstream of Hetch Hetchy Reservoir, Cherry Lake, and Lake Eleanor. When the WSIP was analyzed in the Programmatic Environmental Impact Report, local system reservoirs had no formal flow release requirements, so no instream flow release and bypass requirements were reflected in the water supply program for the Calaveras Dam Replacement and Lower Crystal Springs Dam Improvement Projects. However, changes to the flow schedules for dams on Alameda and San Mateo Creeks that resulted from project permitting impacted the water supply reliability of the RWS. Permitting for future projects may further impact water supply reliability through additional instream flow release or bypass requirements.

As described in Section 3.1.4, the SFPUC uses a portion of the storage capacity of Don Pedro Reservoir as a water bank under agreement with the Districts. The re-licensing of the Don Pedro Reservoir by FERC may require additional water released from the reservoir for the preservation of aquatic species in the lower Tuolumne River,

potentially affecting the yield of the RWS by reducing the balance of water stored in the water bank. FERC released the final Environmental Impact Statement for the re-licensing on July 7, 2020. There is currently no schedule for when FERC will issue the licenses.

7.3.3 Future Water Supply Decisions

In the 2009 WSA, the SFPUC committed to make two decisions before the end of 2018 regarding future water supplies, with the prerequisite of the SFPUC having completed any necessary California Environmental Quality Act (CEQA) review relevant to those decisions:

- Whether or not to make the cities of San Jose and Santa Clara permanent customers of the RWS, if the SFPUC determines that RWS long-term water supplies are available to support their permanent status, and
- Whether or not to increase Supply Assurance above 184 MGD to meet future Wholesale Customer demands.

Prior to 2018, the SFPUC determined that it was prudent to defer these decisions due to uncertainty about water supply availability and future growth patterns in the Bay Area, as well as unprecedented reductions in demands on the RWS, which indicated that total Wholesale Customer demands (including the demands of San Jose and Santa Clara, who do not share in the 184 MGD Supply Assurance) would be 173.9 MGD in 2040. Accordingly, the SFPUC and the Wholesale Customers amended the WSA in 2018, deferring the future water supply decisions to the end of 2028 to allow the SFPUC to conduct further water supply planning, including a reevaluation of RWS demands and supply options, and any necessary CEQA analysis. Based on current projections, Wholesale Customer demands (including the demands of San Jose and Santa Clara) will continue to be less than the 184 MGD Supply Assurance through the year 2050.

The SFPUC's planning efforts to support its decisions regarding the status of San Jose and Santa Clara are a part of the SFPUC's Alternative Water Supply Program as described in Section 7.4.

7.4 ALTERNATIVE WATER SUPPLY PROGRAM

In 2019, the SFPUC established the Alternative Water Supply (AWS) Program to identify and plan water supply and storage projects and actions that increase the dry-year reliability of the RWS. Based on the 2045 planning horizon that the SFPUC applied in its February 2024 AWS Plan, the SFPUC anticipates a water supply gap will occur in future dry years. The AWS Program aims to help fill the gap through local and regional capital projects. The February 2024 AWS Plan identified six regional projects that might partially address the future water supply gap and the priorities for this planning effort. Since the development of that plan, three projects have been deferred (Daly City Recycled Water Expansion, Alameda County Water District-Union Sanitary District Purified Water, and Calaveras Reservoir Expansion) and one project has been canceled (Los Vaqueros Reservoir Expansion). The AWS Program is continuing to pursue the following two projects:

- **PureWater Peninsula**. PureWater Peninsula (formerly known as the Crystal Springs Purified Water Project) is a purified water project that could provide 6 MGD of additional potable water supply to the RWS through surface water augmentation at the SFPUC's Crystal Springs Reservoir. The currently proposed project involves treating wastewater effluent from Silicon Valley Clean Water at a new advanced purified

water facility located on the Peninsula and transmitting that purified water to Crystal Springs Reservoir, where it would blend with RWS surface water supplies before the SFPUC treats it again at Harry Tracy Water Treatment Plant. A future phase could provide an additional 6 MGD of potable water supply to the RWS. Project partners include the SFPUC, Silicon Valley Clean Water, BAWSCA, Mid-Peninsula Water District, California Water Service Company, City of Redwood City, City of Foster City, and City of San Mateo.

- **South Bay Purified Water**. In 2023, the SFPUC, the City of San Jose, and the City of Santa Clara completed an initial feasibility study for the South Bay Purified Water project, envisioned as a 10 MGD purified water project that would serve the local demands of San Jose and Santa Clara during all types of water years and deliver an additional volume of water supply to the RWS in dry years. Currently, Santa Clara Valley Water District (Valley Water) is working with San Jose and Santa Clara to design a larger project to meet broader regional needs. The SFPUC's participation in this project will be based on the regional benefits to the SFPUC's customers. This project may also assist the SFPUC with its decision regarding San Jose and Santa Clara's status as RWS customers, discussed above.

If both AWS projects that SFPUC staff have identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs associated with implementation of the Bay-Delta Plan Amendment. Furthermore, both alternative water supply options are in the planning phase and are subject to changes in institutional structure and design. Given the limited availability of water supply alternatives, unless the supply risks are significantly reduced, the SFPUC will continue to plan, develop, and implement all potential projects that can help bridge the anticipated water supply gap during droughts.

Outside of the AWS Program, the following additional regional projects have been explored by the SFPUC in the past and have been included in previous planning documents. The SFPUC continues to seek opportunities to partner in such projects.

- **Groundwater Banking.** Groundwater banking projects in the Modesto Irrigation District and Turlock Irrigation District service areas could provide the SFPUC with some additional water supply to meet instream flow releases in dry years, reducing water supply impacts on the RWS.

- **Inter-Basin Collaborations.** Inter-Basin Collaborations could include establishing a partnership between agencies on the Tuolumne River (such as the SFPUC) and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology. The Tuolumne system tends to spill more excess flow in wetter years than the Stanislaus system, and this excess flow could potentially be shaped and credited to meet Stanislaus system requirements, while New Melones Reservoir in the Stanislaus system is refilling. Then the stored water could be partially used to provide required streamflow to meet Stanislaus and Tuolumne requirements in future dry years.

- **Dry-Year Transfers.** The SFPUC initiated discussions with the Tuolumne River irrigation districts under WSIP to secure a dry-year transfer (see WSIP Dry-Year Water Supply Projects section above). While no transfer was secured, the SFPUC continues to engage in discussions with irrigation districts to explore potential transfer opportunities.

The SFPUC's AWS Plan published in February 2024 included a planning framework for the SFPUC to consider water supply needs and related tradeoffs; guide the decisions to proceed with environmental review; and continue the development of projects that can best meet anticipated water supply needs. In June 2025, the SFPUC prepared a progress report that provided status updates on the AWS projects. In 2027, the SFPUC plans to review and revise its Alternative Water Supply Plan based on updated information.

7.5 BAY AREA REGIONAL EFFORTS TO IMPROVE WATER SUPPLY RELIABILITY

The following projects and efforts in the San Francisco Bay Area region are currently underway or completed and will help to improve RWS water supply reliability. Some of these projects are reflected in the SFPUC's current strategy for meeting water supply needs described above. As the remainder of these projects move through the planning stages, they will continue to inform the SFPUC's water supply strategy.

Bay Area Regional Reliability. The SFPUC is continuing to work with seven water agencies in the Bay Area (Alameda County Water District, BAWSCA, Contra Costa Water District, East Bay Municipal Utility District [EBMUD], Marin Municipal Water District, Valley Water and Zone 7 Water Agency) to investigate opportunities for collaboration, particularly during future droughts. The purpose of this planning effort, known as Bay Area Regional Reliability (BARR) Partnership, is to collaborate regionally and potentially (1) identify projects and processes to enhance water supply reliability in the Bay Area, such as desalinated water projects, (2) leverage existing infrastructure investments, (3) facilitate water transfers during critical shortages, and (4) improve climate change resiliency. BARR water agencies continue to track short-term response actions and longer-term projects that were identified in the 2017 Bay Area Regional Reliability Drought Contingency Plan.

Regional Interties. Regional interties, which connect the RWS with systems of other water agencies, help increase the reliability of the RWS by allowing for water exchanges between the SFPUC and other water agencies during emergencies, water shortages, or maintenance.

- **EBMUD-Hayward-SFPUC Emergency Intertie:** In 2002, the SFPUC formed a partnership with EBMUD and the City of Hayward to construct Skywest Pump Station and 1.5 miles of pipeline to link the SFPUC, EBMUD, and Hayward water systems. These facilities can convey up to 30 MGD among these three agencies to boost water supply reliability during emergencies. EBMUD and the SFPUC own these facilities jointly, while the City of Hayward maintains and operates them in coordination with EBMUD and the SFPUC.

- **SFPUC-Valley Water Intertie:** The SFPUC and Valley Water maintain a 40-MGD intertie between their two systems at Milpitas to exchange water during emergencies and planned maintenance. The intertie has been used on several occasions during maintenance of Valley Water's system.

- **South Bay Aqueduct Intertie:** The South Bay Aqueduct Intertie connects the South Bay Aqueduct and the SFPUC's San Antonio Reservoir and was used by the SFPUC in 1991-1992 for a two-year water transfer. The SFPUC may upgrade this intertie to receive State Water Project water in the event of a future emergency.

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SECTION 8: WATER SUPPLY RELIABILITY ASSESSMENT

8.1 CONSTRAINTS ON SUPPLIES

The following list summarizes the legal, environmental, water quality, climatic, and other factors that could constrain or reduce water supply reliability.

- **RWS:** As described previously, there may be shortfalls of RWS supplies in dry years as a result of several factors, including required instream flow releases (see Section 7.3) as well as climate change (see Section 6.1.3).
- **Retail Groundwater:** Groundwater supplies are typically limited by the quality and quantity of available supplies. However, the probability of these impacts occurring is low with proper management of the Westside Groundwater Basin as described in Section 6.2.1.1.
- **Retail Recycled Water:** Recycled water is limited by water quality requirements that legally restrict recycled water supply for some uses. However, recycled water supplies discussed herein are treated, or are planned to be treated, to the standards established by State agencies that are required for each designated end use. As a result, no limitations on use of recycled water for designated purposes are expected to occur.

The 2018 adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, the SFPUC must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. Similarly, there is active litigation at the appellate level regarding the Bay-Delta Plan Amendment. The SFPUC is also pursuing a voluntary agreement, known as the Healthy Rivers and Landscapes Program (HRL). The HRL is currently undergoing evaluation at the SWRCB. In fall of 2025, the SWRCB released a Scientific Basis Report evaluating the biological benefits of the Tuolumne River component of the HRL. The next step is for the SWRCB to finalize this report, including scientific peer review. At the same time, the SWRCB is undergoing CEQA evaluation of the Tuolumne HRL. No timeline has been provided for when the HRL will be considered for adoption by the SWRCB.

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the following water supply reliability assessment includes a set of tables for two future supply scenarios: (1) a scenario in which the Bay-Delta Plan Amendment is implemented and (2) a scenario that considers the SFPUC system's current conditions without implementation of the Bay-Delta Plan Amendment. The two scenarios provide bookends for the possible future scenarios regarding RWS supplies. The Bay-Delta Plan Amendment implementation start date is unknown; for the purposes of the supply reliability analysis, it is included in the 2030 modeling scenarios. The submittal tables associated with this UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment.

There are additional factors that could affect water supply availability, including SWRCB curtailments and agreements with Turlock and Modesto Irrigation Districts pertaining to instream flow obligations on the Tuolumne River. The following describes these factors and how they were incorporated into the water supply reliability analysis.

- During the last two drought periods, 2013-2016 and 2021-2023, the SWRCB implemented curtailments through emergency regulations and curtailment orders that attempted to limit diversions from Central Valley watersheds including the Tuolumne River at certain times. Due to the uncertain legality of the SWRCB's curtailment actions as well as the uncertainties regarding any potential future curtailment actions against San Francisco, the SFPUC's RWS supply reliability analyses do not assume curtailments are in effect.

- Through a 1966 agreement with the Modesto and Turlock Irrigation Districts (Districts), who are more senior downstream appropriative water rights holders on the Tuolumne River, San Francisco may become responsible for up to approximately 51.7% of any flow releases the Federal Energy Regulatory Commission (FERC) may require through issuance of a new license for the Districts' Don Pedro Hydropower Project. The exact flow contribution for which San Francisco may become responsible is highly uncertain and may depend on multiple currently unknown factors, including an anticipated Endangered Species Act biological opinion from the National Marine Fisheries Service and a Clean Water Act section 401 water quality certification from the SWRCB. San Francisco's potential responsibility for FERC-ordered flows may further depend on San Francisco's ability to enter into a new or extended agreement with the Districts to offset a portion of San Francisco's flow contributions in exchange for payment. Due to the high levels of uncertainty surrounding the Districts' FERC-relicensing process, as well as the unknown timing for license issuance, the SFPUC's RWS water supply reliability analyses do not assume additional water supply losses from any potential new FERC-ordered flow releases.

- The simulation of the Bay-Delta Plan Amendment scenario assumes that a 1996 agreement between San Francisco and the Districts (the Side Agreement), which allows San Francisco to pay the Districts in lieu of contributing a portion of current FERC-ordered flow releases, remains in effect, and that the San Francisco share of flows in excess of and not covered by the Side Agreement is approximately 51.7%. These assumptions were made for the purpose of completing the modeling for the UWMP update, and they do not represent a commitment by San Francisco or the Districts to any future agreement or San Francisco's acceptance of responsibility for any future FERC-ordered flow releases.

8.2 WATER SUPPLY MODELING

8.2.1 Data and Methods

The SFPUC used its Hetch Hetchy and Local Simulation Model (HHLSM) to perform the water supply analyses for the supply reliability assessment and the drought risk assessment within this 2025 UWMP. HHLSM combines a historical record of hydrology from 1920 through 2025 with a current representation of RWS infrastructure and operations. The simulated operations include decisions on water supply rationing during droughts. The use of those results is described below.

A key input for the HHLSM is the anticipated level of demand on the RWS. Supply modeling results presented in this 2025 UWMP reflect an input of projected demands on the RWS consisting of (1) projected retail customer demands on the RWS (total retail customer demands minus local groundwater and recycled water supplies, see Table 4-1 and Table 6-5), and (2) projected Wholesale Customer purchases (see Table 4-5). The SFPUC has estimated total RWS demands for 2030 through 2050 and used these estimates in HHLSM simulation of RWS water supply reliability. The SFPUC has a Level of Service objective of meeting average annual water demand of

265 MGD from the SFPUC watersheds for retail and Wholesale Customers during non-drought years consistent with the WSA, under which the SFPUC has a contractual obligation to supply up to 184 MGD to the Wholesale Customers. Therefore, the SFPUC has also conducted modeling that assumes Wholesale Customer demand is 184 MGD to facilitate planning that supports meeting this contractual obligation in Appendix E.

In a normal year, the SFPUC can provide up to 265 MGD of supply from the RWS. However, as described previously in Section 6.1.4, the SFPUC has defined normal year RWS supply in the context of this 2025 UWMP as the supply that it will use to meet the full demands on the RWS in a non-drought year.

8.2.2 Design Drought

In the six-year period of 1987-92, a shortfall developed between the SFPUC's supplies and its customers' demands such that significant rationing of water supply became necessary. Following the 1987-92 drought experience, the SFPUC included the concept of its "firm" capability in water supply planning, which is defined as the amount of water the RWS can be expected to deliver during drought periods.

The SFPUC uses a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought consists of the 1987-92 drought, followed by an additional 2.5 years of dry conditions from the hydrologic record that include the 1976-77 drought. While the 2012-2016 and 2020-2023 droughts include some of the driest years on record for the SFPUC's watersheds, the design drought still represents a more severe drought in duration and overall water supply deficit.

More specifically, the design drought sequence used by the SFPUC for reliability planning is an 8.5-year period composed of the following elements:

- **Historical Hydrology:** A six-year sequence of hydrology from the historical drought that occurred from July 1986 to June 1992;
- **Prospective Drought:** A 2.5-year period that includes the 1976-77 drought (to represent a drought sequence worse than historical); and
- **System Recovery Period:** The last six months of the design drought are the beginning of the system recovery period. The precipitation begins in the fall, and by approximately the month of December, inflow to RWS reservoirs exceeds customer demands and SFPUC system storage begins to recover.

8.2.3 Definition of Water Supply Scenarios (Normal, Dry, and Multiple Dry Years)

The total amount of water the SFPUC can deliver to the retail and wholesale customers depends on several factors, including the amount of water that is available to the SFPUC from natural runoff, the amount of water in reservoir storage, and the amount of water that the SFPUC must release from the RWS for purposes other than customer deliveries (e.g., required instream flow releases below RWS reservoirs). For planning purposes, the SFPUC "normal year" is based on historical hydrology under conditions that allow the RWS reservoirs to be filled over the course of the snowmelt season, allowing full deliveries to customers. Normal year supply corresponds to supply that will be used to meet the full demands on the RWS in a normal year, as shown in Table 6-1.

For dry-year supply scenarios, the SFPUC plans its water deliveries using indicators for water supply rationing that are developed through analysis with the design drought sequence described above. As a result, the SFPUC designs its system operations to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during and after multiple dry years. Normal, single dry, and multiple dry year conditions are on a water year basis. Dry year availability is presented in terms of percentage of normal year availability.

The water supply reliability assessment presented in this section assumed the statuses of the WSIP projects shown in Table 8-1 over the 2025 UWMP planning horizon. The WSIP projects will collectively contribute to minimizing the anticipated RWS supply reductions in multiple dry years.

Table 8-2 summarizes the expected availability of local groundwater and local recycled water which are only available to meet retail demands. Groundwater and recycled water availability are not impacted by the implementation of the Bay-Delta Plan Amendment. Tables 8-3 and 8-4 show RWS supplies under normal, single dry, and multiple dry year conditions and for the two supply scenarios. Collectively, Tables 8-1 through 8-4 form the basis for the retail and wholesale supply reliability assessments presented in Sections 8.3 and 8.4.

The SFPUC estimated the levels of water supply deficiency, presented in this 2025 UWMP, using the design drought methodology discussed above. The five consecutive dry-year sequence shown in Table 8-3 through Table 8-8 represents years 2 through 6 of the design drought. The SFPUC chose this sequence because year 2 is the first year in which system-wide water use reductions could take effect, since the design drought sequence generally begins year 1 with full reservoirs. The SFPUC has presented the results in the standardized format prescribed by DWR. Additionally, the SFPUC has a Water Shortage Contingency Plan (WSCP) that defines six distinct shortage levels that the RWS may experience and the corresponding actions that the SFPUC would take to address the water shortage, ranging from use of dry year water supplies (when available), voluntary water use reductions, and mandatory water use reductions.

The SFPUC modeled two scenarios for RWS supplies: with implementation of the Bay-Delta Plan Amendment, and without the implementation of the Bay-Delta Plan Amendment. These modeled scenarios show significantly different supply reliability projections for the RWS and are summarized as follows:

- **With Implementation of the Bay-Delta Plan Amendment:** The SFPUC anticipates RWS supplies will experience a reduction of up to 43% from normal year supplies through the multiple dry-year sequence. The implementation of the Alternative Water Supply Program and associated potential projects will help reduce the anticipated supply shortfalls.
- **Without Implementation of the Bay-Delta Plan Amendment:** There are no anticipated shortages of RWS supplies.

Table 8-1. WSIP Project Assumptions for RWS Supply Modeling

Projects	Base Year 2025	Base Year 2030	Base Year 2040 and Beyond
Lower Crystal Springs Dam Improvements	Crystal Springs storage not fully restored	Crystal Springs storage not fully restored	Crystal Springs storage not fully restored
Regional Groundwater Storage and Recovery (RGSR) Project	RGSR account partially filled at spring 2020 level of 43,000 AF; RGSR recovery rate of 5.2 MGD[a]	RGSR account fully filled; RGSR recovery rate of 5.2 MGD[a]	RGSR account fully filled; RGSR recovery rate of 6.2 MGD[a]
Alameda Creek Recapture Project	Project not built	Project built and operating	Project built and operating
Dry-Year Transfers	Not in effect	Not in effect	Not in effect

a The RGSR Project was intended to provide 7.2 MGD over 7.5 years; however, current limitations on the number of wells available will result in deliveries less than 7.2 MGD over 7.5 years.

Table 8-2. Retail Groundwater and Recycled Water Supply Availability During Normal and Dry Years

[Submittal Table 7-1 Retail: Bases of Water Year Data (Reliability Assessment)]

Water Supply	Normal Year	Single Dry Year	Dry Year 1	Dry Year 2	Dry Year 3	Dry Year 4	Dry Year 5
Local Groundwater	100%	100%	100%	100%	100%	100%	100%
Local Recycled Water	100%	100%	100%	100%	100%	100%	100%

Table 8-3. Regional Water System Supply Availability During Normal and Dry Years (Base Years 2030–2050) With Bay-Delta Plan Amendment

[Submittal Table 7-1 Retail: Bases of Water Year Data (Reliability Assessment)]

Base Year	Normal Year	Single Dry Year	Dry Year 1	Dry Year 2	Dry Year 3	Dry Year 4	Dry Year 5
2030	100%	75%	75%	63%	63%	63%	63%
2035	100%	74%	74%	63%	63%	63%	63%
2040	100%	72%	72%	61%	61%	61%	61%
2045	100%	70%	70%	59%	59%	59%	59%
2050	100%	68%	68%	57%	57%	57%	57%

Table 8-4. Regional Water System Supply Availability During Normal and Dry Years (Base Years 2030–2050) Without Bay-Delta Plan Amendment

Base Year	Normal Year	Single Dry Year	Dry Year 1	Dry Year 2	Dry Year 3	Dry Year 4	Dry Year 5
2030	100%	100%	100%	100%	100%	100%	100%
2035	100%	100%	100%	100%	100%	100%	100%
2040	100%	100%	100%	100%	100%	100%	100%
2045	100%	100%	100%	100%	100%	100%	100%
2050	100%	100%	100%	100%	100%	100%	100%

8.2.4 Allocating Regional Water System Supply

The Water Shortage Allocation Plan (WSAP), also known as the Tier 1 Shortage Plan, is incorporated in the WSA and describes the method for allocating water between the SFPUC and Wholesale Customers during shortages caused by drought. The WSAP also implements a method for allocating water among the individual Wholesale Customers, known as the Tier 2 Drought Response Implementation Plan, which has separately been adopted by the Wholesale Customers and does not include the SFPUC.

The WSAP identifies the Retail Customers' and Wholesale Customers' respective shares of the annual water supply available during shortages that require system-wide reductions in water use of 20% or less. For example, when the required level of system-wide reduction in water use is 6 to 10%, the Retail Customer Tier 1 Allocation is 36% of the annual water supply available, and the Wholesale Customer Tier 1 Allocation is 64% of the annual water supply available. The WSCP, which further describes the WSAP, includes a table illustrating the Retail Customers' and Wholesale Customers' respective percentage shares at different shortage levels. Under the WSAP, if the Retail Customers' share of the available water supply results in the Retail Customers having a "positive allocation" (i.e., a supply of additional water rather than a percentage reduction in water use), then the Retail Customers' percentage share of the available water supply would be reduced to eliminate any positive allocation to the Retail Customers, with a corresponding increase in the percentage share of the available water supply allocated to the Wholesale Customers. For any level of required reduction in system-wide water use, the SFPUC shall require the Retail Customers to conserve a minimum of 5%, with any resulting reallocated supply credited to storage for inclusion in the calculation of projected available RWS supply in a subsequent year. For planning purposes, it is assumed that Retail Customers collectively achieve a 5% reduction if projected Retail Customer demand is greater than the Retail Customer allocation in dry years.

8.3 WATER SUPPLY AND DEMAND COMPARISONS WITH BAY-DELTA PLAN AMENDMENT

The following sections summarize the projected retail and wholesale supplies and demands during normal, single dry, and multiple dry years (on a water year basis) for the scenario with implementation of the Bay-Delta Plan Amendment. The demand assumptions for this analysis are as follows:

- Total retail demands are those presented in Table 4-1, which reflect active and passive conservation, onsite water reuse savings, and water loss.
- Total wholesale demands are the Wholesale Customer purchase requests presented in Table 4-5, including those of the cities of San Jose and Santa Clara. A reliability assessment that includes the Supply Assurance of 184 MGD is presented in Appendix E.

Supplies are listed by source: RWS, groundwater (retail only), and recycled water (retail only). The difference between supply and demand, resulting in either a supply surplus or deficit, is also provided for each scenario. As noted earlier, Groveland CSD is accounted for as a retail customer in this section, but as a wholesale customer in the corresponding submittal tables.

8.3.1 Retail Water Service Reliability Assessment With Bay-Delta Plan Amendment

The instream flow requirements of the Bay-Delta Plan Amendment would affect RWS supplies in both single dry year and multiple dry year scenarios. Table 8-5 compares projected retail demands and supplies under the Bay-Delta Plan Amendment and shows the following:

- **Normal Years:** The SFPUC will have sufficient supplies to meet projected retail demands.
- **Single Dry Year:** RWS supplies show an anticipated shortfall between 25–32%. After allocating available RWS supplies between retail and Wholesale Customers and comparing total retail supplies (RWS plus local supplies) to projected retail demands, the retail portion of supplies shows a shortage of 9–17% (6–12 MGD).
- **Multiple Dry Years:** RWS supplies show an anticipated shortfall between 25–43%. After allocating available RWS supplies between retail and Wholesale Customers and comparing total retail supplies (RWS plus local supplies) to projected retail demands, the retail portion of supplies shows a shortage of up to 29%, or nearly 21 MGD, by the fifth consecutive dry year at 2050 demand levels.

8.3.2 Wholesale Water Service Reliability Assessment With Bay-Delta Plan Amendment

The comparison of wholesale demands and supplies under the Bay-Delta Plan Amendment, shown in Table 8-6, demonstrates the following:

- **Normal Years:** The SFPUC will have sufficient supplies to meet projected wholesale water demands.
- **Single Dry Year:** RWS supplies show an anticipated shortfall between 25–32%. After allocating available RWS supplies between retail customers and Wholesale Customers and comparing Wholesale Customer allocation to projected Wholesale Customer demands, the Wholesale Customer portion of supplies shows a shortage ranging from 31–39% (41–57 MGD).
- **Multiple Dry Years:** RWS supplies show an anticipated shortfall between 25–43%. After allocating available RWS supplies between retail and Wholesale Customers and comparing Wholesale Customer allocation to projected Wholesale Customer demands, the Wholesale Customer portion of supplies shows a shortage of up to 49%, or nearly 72 MGD, by the fifth consecutive dry year at 2050 demand levels.

Table 8-5. Retail Supply and Demand Comparison for Projected Normal and Dry Year Scenarios With Bay-Delta Plan Amendment (MGD)

[Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison]
[Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison]
[Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison]

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Dry Year 1[a]	Dry Year 2[a]	Dry Year 3[a]	Dry Year 4[a]	Dry Year 5[a]
2030	Total Retail Demand	67.0	67.0	67.0	67.0	67.0	67.0	67.0
2030	Total Retail Supply	67.0	59.6	59.6	50.8	50.8	50.8	50.8
2030	*Retail Groundwater[b]*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*
2030	*Retail Recycled Water[c]*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
2030	*RWS Supply Utilized by Retail[d]*	*62.7*	*55.3*	*55.3*	*46.4*	*46.4*	*46.4*	*46.4*
2030	Difference (Supply Surplus or Shortfall)	0.0	-7.4	-7.4	-16.2	-16.2	-16.2	-16.2
2030	Difference as Percentage of Demand	0.0%	-11.0%	-11.0%	-24.2%	-24.2%	-24.2%	-24.2%
2035	Total Retail Demand	66.5	66.5	66.5	66.5	66.5	66.5	66.5
2035	Total Retail Supply	66.5	60.1	60.1	52.0	52.0	52.0	52.0
2035	*Retail Groundwater[b]*	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*
2035	*Retail Recycled Water[c]*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
2035	*RWS Supply Utilized by Retail[d]*	*61.2*	*54.8*	*54.8*	*46.7*	*46.7*	*46.7*	*46.7*
2035	Difference (Supply Surplus or Shortfall)	0.0	-6.4	-6.4	-14.5	-14.5	-14.5	-14.5
2035	Difference as Percentage of Demand	0.0%	-9.6%	-9.6%	-21.8%	-21.8%	-21.8%	-21.8%
2040	Total Retail Demand	68.6	68.6	68.6	68.6	68.6	68.6	68.6
2040	Total Retail Supply	68.6	61.4	61.4	53.0	53.0	53.0	53.0
2040	*Retail Groundwater[b]*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*
2040	*Retail Recycled Water[c]*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*
2040	*RWS Supply Utilized by Retail[d]*	*61.9*	*54.7*	*54.7*	*46.3*	*46.3*	*46.3*	46.3
2040	Difference (Supply Surplus or Shortfall)	0.0	-7.2	-7.2	-15.6	-15.6	-15.6	-15.6
2040	Difference as Percentage of Demand	0.0%	-10.5%	-10.5%	-22.7%	-22.7%	-22.7%	-22.7%
2045	Total Retail Demand	70.7	70.7	70.7	70.7	70.7	70.7	70.7
2045	Total Retail Supply	70.7	61.4	61.4	52.8	52.8	52.8	52.8
2045	*Retail Groundwater[b]*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*
2045	*Retail Recycled Water[c]*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*
2045	*RWS Supply Utilized by Retail[d]*	*64.0*	*54.6*	*54.6*	*46.1*	*46.1*	*46.1*	*46.1*
2045	Difference (Supply Surplus or Shortfall)	0.0	-9.3	-9.3	-17.9	-17.9	-17.9	-17.9
2045	Difference as Percentage of Demand	0.0%	-13.2%	-13.2%	-25.4%	-25.4%	-25.4%	-25.4%

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Dry Year 1[a]	Dry Year 2[a]	Dry Year 3[a]	Dry Year 4[a]	Dry Year 5[a]
2050	Total Retail Demand	73.4	73.4	73.4	73.4	73.4	73.4	73.4
2050	Total Retail Supply	73.4	61.6	61.6	52.7	52.7	52.7	52.7
2050	*Retail Groundwater[b]*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*
2050	*Retail Recycled Water[c]*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*
2050	*RWS Supply Utilized by Retail[d]*	*66.7*	*54.8*	*54.8*	*46.0*	*46.0*	*46.0*	*46.0*
2050	Difference (Supply Surplus or Shortfall)	0.0	-11.8	-11.8	-20.7	-20.7	-20.7	-20.7
2050	Difference as Percentage of Demand	0.0%	-16.1%	-16.1%	-28.2%	-28.2%	-28.2%	-28.2%

a During single and multiple dry years, system-wide shortages exceed 20% (see Table 8-3). For this analysis, any RWS shortage greater than 20% uses the same retail and wholesale allocation as the WSCP Shortage Level 6, in which 37.5% of available RWS supply is allocated to retail customers and 62.5% to Wholesale Customers.

b Groundwater supplies are assumed to equal projected demands for the San Francisco Groundwater Supply Project (ramping up to 4 MGD by 2040) and Castlewood CSA (0.3 MGD). Groundwater availability is not expected to be affected by dry-year conditions.

c Recycled water supplies are assumed to equal projected demands for the Westside Enhanced Water Recycling Project (1.58 MGD by 2027 and 1.68 MGD by 2030), Harding Park and Fleming Golf Courses (0.20 MGD), Sharp Park Golf Course (up to 0.10 MGD), and Treasure Island (0.04 MGD by 2026 and 0.43 MGD by 2037). Recycled water availability would not be affected by dry-year conditions.

d Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, in normal years, if groundwater and recycled water are not available, up to 81 MGD of RWS supply may be used.

Table 8-6. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios With Bay-Delta Plan Amendment (MGD)

[Submittal Table 7-2 Wholesale: Normal Year Supply and Use Comparison]
[Submittal Table 7-3 Wholesale: Single Dry Year Supply and Use Comparison]
[Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Use Comparison]

Year	Wholesale Supply and Demand	Normal Year	Single Dry Year[a]	Dry Year 1[a]	Dry Year 2[a]	Dry Year 3[a]	Dry Year 4[a]	Dry Year 5[a]
2030	Total Wholesale Demand	133.9	133.9	133.9	133.9	133.9	133.9	133.9
2030	Total Wholesale RWS Supply[b]	133.9	92.1	92.1	77.4	77.4	77.4	77.4
2030	Difference (Surplus or Shortfall)	0.0	-41.8	-41.8	-56.5	-56.5	-56.5	-56.5
2030	Difference as % of Demand	0.0%	-31.2%	-31.2%	-42.2%	-42.2%	-42.2%	-42.2%
2035	Total Wholesale Demand	136.3	136.3	136.3	136.3	136.3	136.3	136.3
2035	Total Wholesale RWS Supply[b]	136.3	91.3	91.3	77.8	77.8	77.8	77.8
2035	Difference (Surplus or Shortfall)	0.0	-45.0	-45.0	-58.6	-58.6	-58.6	-58.6
2035	Difference as % of Demand	0.0%	-33.0%	-33.0%	-43.0%	-43.0%	-43.0%	-43.0%
2040	Total Wholesale Demand	140.6	140.6	140.6	140.6	140.6	140.6	140.6
2040	Total Wholesale RWS Supply[b]	140.6	91.1	91.1	77.2	77.2	77.2	77.2
2040	Difference (Surplus or Shortfall)	0.0	-49.5	-49.5	-63.4	-63.4	-63.4	-63.4
2040	Difference as % of Demand	0.0%	-35.2%	-35.2%	-45.1%	-45.1%	-45.1%	-45.1%
2045	Total Wholesale Demand	144.1	144.1	144.1	144.1	144.1	144.1	144.1
2045	Total Wholesale RWS Supply[b]	144.1	91.1	91.1	76.8	76.8	76.8	76.8
2045	Difference (Surplus or Shortfall)	0.0	-53.0	-53.0	-67.3	-67.3	-67.3	-67.3
2045	Difference as % of Demand	0.0%	-36.8%	-36.8%	-46.7%	-46.7%	-46.7%	-46.7%
2050	Total Wholesale Demand	148.4	148.4	148.4	148.4	148.4	148.4	148.4
2050	Total Wholesale RWS Supply[b]	148.4	91.4	91.4	76.6	76.6	76.6	76.6
2050	Difference (Surplus or Shortfall)	0.0	-56.9	-56.9	-71.7	-71.7	-71.7	-71.7
2050	Difference as % of Demand	0.0%	-38.4%	-38.4%	-48.3%	-48.3%	-48.3%	-48.3%

a During single and multiple dry years, system-wide shortages exceed 20% (see Table 8-3). For this analysis, any shortage greater than 20% uses the same retail and wholesale allocation as WSCP Shortage Level 6, in which 37.5% of available RWS supply is allocated to retail customers and 62.5% to Wholesale Customers.

b The WSAP sets forth the procedures for allocating available RWS supplies between the Retail and Wholesale Customers during water shortages.

8.4 WATER SUPPLY AND DEMAND COMPARISONS WITHOUT BAY-DELTA PLAN AMENDMENT

The following subsections summarize the projected retail and wholesale supplies and demands during normal, single dry, and multiple dry years (on a water year basis) for the scenario without implementation of the Bay-Delta Plan Amendment.

8.4.1 Retail Water Service Reliability Assessment Without Bay-Delta Plan Amendment

Table 8-7 compares projected retail demands and supplies in this scenario and demonstrates the following:

- **Normal Years:** The SFPUC will have sufficient supplies to meet its projected retail demands.
- **Single Dry Year:** The SFPUC will have sufficient supplies to meet its projected retail demands.
- **Multiple Dry Years:** The SFPUC will have sufficient supplies to meet its projected retail demands.

8.4.2 Wholesale Water Service Reliability Assessment Without Bay-Delta Plan Amendment

Total wholesale demands correspond to the wholesale purchase projections, including those of the cities of San Jose and Santa Clara. Groveland CSD is not treated as a wholesale customer for the purpose of this section. However, in the corresponding submittal tables, Groveland CSD is reported as wholesale rather than retail.

The comparison of wholesale demands and supplies under this scenario, presented in Table 8-8, demonstrates the following:

- **Normal Years:** The SFPUC will have sufficient supplies to meet its projected wholesale demands.
- **Single Dry Year:** The SFPUC will have sufficient supplies to meet its projected wholesale demands.
- **Multiple Dry Years:** The SFPUC will have sufficient supplies to meet its projected wholesale demands.

Table 8-7. Retail Supply and Demand Comparison for Projected Normal and Dry Year Scenarios Without Bay-Delta Plan Amendment (MGD)

Year	Retail Supply and Demand	Normal Year	Single Dry Year	Dry Year 1	Dry Year 2	Dry Year 3	Dry Year 4	Dry Year 5
2030	Total Retail Demand	67.0	67.0	67.0	67.0	67.0	67.0	67.0
2030	Total Retail Supply	67.0	67.0	67.0	67.0	67.0	67.0	67.0
2030	*Retail Groundwater[a]*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*	*2.3*
2030	*Retail Recycled Water[b]*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
2030	*RWS Supply Utilized by Retail[c]*	*62.7*	*62.7*	*62.7*	*62.7*	*62.7*	*62.7*	*62.7*
2030	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2030	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2035	Total Retail Demand	66.5	66.5	66.5	66.5	66.5	66.5	66.5
2035	Total Retail Supply	66.5	66.5	66.5	66.5	66.5	66.5	66.5
2035	*Retail Groundwater[a]*	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*	*3.3*
2035	*Retail Recycled Water[b]*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
2035	*RWS Supply Utilized by Retail[c]*	*61.2*	*61.2*	*61.2*	*61.2*	*61.2*	*61.2*	*61.2*
2035	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2035	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2040	Total Retail Demand	68.6	68.6	68.6	68.6	68.6	68.6	68.6
2040	Total Retail Supply	68.6	68.6	68.6	68.6	68.6	68.6	68.6
2040	*Retail Groundwater[a]*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*
2040	*Retail Recycled Water[b]*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*
2040	*RWS Supply Utilized by Retail[c]*	*61.9*	*61.9*	*61.9*	*61.9*	*61.9*	*61.9*	*61.9*
2040	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2040	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2045	Total Retail Demand	70.7	70.7	70.7	70.7	70.7	70.7	70.7
2045	Total Retail Supply	70.7	70.7	70.7	70.7	70.7	70.7	70.7
2045	*Retail Groundwater[a]*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*
2045	*Retail Recycled Water[b]*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*
2045	*RWS Supply Utilized by Retail[c]*	*64.0*	*64.0*	*64.0*	*64.0*	*64.0*	*64.0*	*64.0*
2045	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2045	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Year	Retail Supply and Demand	Normal Year	Single Dry Year	Dry Year 1	Dry Year 2	Dry Year 3	Dry Year 4	Dry Year 5
2050	Total Retail Demand	73.4	73.4	73.4	73.4	73.4	73.4	73.4
2050	Total Retail Supply	73.4	73.4	73.4	73.4	73.4	73.4	73.4
2050	*Retail Groundwater*[a]	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*	*4.3*
2050	*Retail Recycled Water*[b]	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*
2050	*RWS Supply Utilized by Retail*[c]	*66.7*	*66.7*	*66.7*	*66.7*	*66.7*	*66.7*	*66.7*
2050	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2050	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

a Groundwater supplies are assumed to equal projected demands for the San Francisco Groundwater Supply Project (ramping up to 4 MGD by 2040) and Castlewood CSA (0.3 MGD). Groundwater availability would not be affected by dry-year conditions.

b Recycled water supplies are assumed to equal projected demands for the Westside Enhanced Water Recycling Project (1.58 MGD by 2027 and 1.68 MGD by 2030), Harding Park and Fleming Golf Courses (0.20 MGD), Sharp Park Golf Course (up to 0.10 MGD), and Treasure Island (0.04 MGD by 2026 and 0.43 MGD by 2037). Recycled water availability would not be affected by dry-year conditions.

c Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, in normal years, if groundwater and recycled water are not available, up to 81 MGD of RWS supply may be used.

Table 8-8. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios Without Bay-Delta Plan Amendment (MGD)

Year	Wholesale Supply and Demand	Normal Year	Single Dry Year	Dry Year 1	Dry Year 2	Dry Year 3	Dry Year 4	Dry Year 5
2030	Total Wholesale Demand	133.9	133.9	133.9	133.9	133.9	133.9	133.9
2030	Total Wholesale RWS Supply	133.9	133.9	133.9	133.9	133.9	133.9	133.9
2030	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2030	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2035	Total Wholesale Demand	136.3	136.3	136.3	136.3	136.3	136.3	136.3
2035	Total Wholesale RWS Supply	136.3	136.3	136.3	136.3	136.3	136.3	136.3
2035	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2035	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2040	Total Wholesale Demand	140.6	140.6	140.6	140.6	140.6	140.6	140.6
2040	Total Wholesale RWS Supply	140.6	140.6	140.6	140.6	140.6	140.6	140.6
2040	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2040	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2045	Total Wholesale Demand	144.1	144.1	144.1	144.1	144.1	144.1	144.1
2045	Total Wholesale RWS Supply	144.1	144.1	144.1	144.1	144.1	144.1	144.1
2045	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2045	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2050	Total Wholesale Demand	148.4	148.4	148.4	148.4	148.4	148.4	148.4
2050	Total Wholesale RWS Supply	148.4	148.4	148.4	148.4	148.4	148.4	148.4
2050	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2050	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

8.5 DROUGHT RISK ASSESSMENT

The SFPUC developed the following Drought Risk Assessment (DRA) in compliance with Water Code Section 10635(b). The analysis presents a methodical assessment of water supplies and water uses under a hypothetical five-year drought scenario that extends from 2026 to 2030.

8.5.1 Data and Methods

The data and methods used to determine the RWS supply for the DRA dry-year sequence are the same as those described in Section 8.2. The SFPUC used the HHLSM with the design drought sequence to perform the water supply analyses and simulate the water supply shortage conditions over the five-year drought period.

Because the start date of the implementation of the Bay-Delta Plan Amendment is unknown, the DRA considers the supply scenario without the implementation of the Bay-Delta Plan Amendment.

The DRA also takes into consideration the implementation of recycled water and groundwater supply projects that the SFPUC has planned to be in operation by 2030. In addition, the retail demands for the DRA are based on linear interpolation between the current retail demands of 62.5 MGD and the projected 2030 retail demands of 67.0 MGD, as presented in Section 4.

8.5.2 Basis for Supply Shortage Conditions

Assuming the availability of existing supplies at current demand levels, there are no anticipated reductions in RWS supply.

8.5.3 DRA Water Source Reliability

The DRA accounts for the supplies from the RWS, local groundwater, and local recycled water. The recycled water and groundwater projects that the SFPUC has planned for implementation within the next five years are integrated into the available supply portfolio for this five-year drought scenario. The SFPUC plans to increase recycled water supplies from 0.12 MGD in 2025 to 2.0 MGD in 2030 through the implementation of the Westside Enhanced Water Recycling Project and the Treasure Island Water Resource Recovery Facility. It is assumed that the Westside Enhanced Water Recycling Project will supply approximately 1.3 MGD to Golden Gate Park and Lincoln Park, and approximately 0.3 MGD to the San Francisco Zoo and Lower Great Highway by 2027. In 2027, groundwater supplies used for irrigation will be replaced by recycled water from the Westside Enhanced Water Recycling Project. The groundwater production from 2026 to 2030 includes the in-City potable use (~0.25 MGD) and the Castlewood Well System (~0.3 MGD). In-City potable groundwater is assumed to increase from 0.25 MGD in 2025 to 1.5 MGD in 2029.

8.5.4 Water Supply and Demand Comparison for 5-Year Drought Sequence

The supply and demand comparisons for the hypothetical drought sequence from 2026 to 2030 are presented below in Table 8-9 for the scenario without implementation of the Bay-Delta Plan Amendment since the start date of implementation is unknown. Under this scenario, the SFPUC has sufficient supplies to serve its retail demands in the event of a five-year drought starting in 2026.

Table 8-9. Retail Supply and Demand Comparison for Five-Year Drought Risk Assessment

[Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment]

	2026	2027	2028	2029	2030
Total Water Use[a]	63.4	64.3	65.2	66.1	67.0
Supply Sources					
RWS Supply[b]	61.0	61.7	62.6	62.3	62.7
Groundwater[c]	2.1	0.7	0.7	1.9	2.3
Recycled Water[d]	0.3	1.9	1.9	1.9	2.0
Total Supplies[e]	63.4	64.3	65.2	66.1	67.0
Surplus/Shortfall w/o WSCP Action	0.0	0.0	0.0	0.0	0.0

a Total retail demands reflect active and passive conservation, onsite water reuse savings, and water loss; demands are linearly interpolated between 2025 and 2030.

b Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, in normal years, if groundwater and recycled water are not available, up to 81 MGD of RWS supply may be used.

c This assumes that the in-City groundwater capacity for irrigation accounts is approximately 0.5 MGD, the in-City groundwater for potable use is 1.5 MGD, and Castlewood CSA uses 0.3 MGD in 2026. When the Westside Enhanced Water Recycling Project comes online in 2027, groundwater for irrigation decreases to 0.5 MGD. The groundwater production from 2026 to 2029 assumes 0.25 MGD for in-City potable use and 0.3 MGD supplied by the Castlewood Well System. The potable groundwater production is anticipated to increase to 1.5 MGD in 2029.

d This assumes the following: (1) Treasure Island Recycled Water Project will add 0.04 MGD by 2026; (2) the Westside Enhanced Water Recycling Project will supply 1.7 MGD of recycled water to Golden Gate Park (1.2 MGD), Lincoln Park (0.1 MGD), SF Zoo and the Lower Great Highway (0.3 MGD) by 2027 and to Sunset Boulevard (0.1 MGD) by 2030; and (3) existing production from Sharp Park (0.1 MGD) and Harding Park (0.2 MGD) Recycled Water Projects.

e Rows above may not sum to total due to rounding.

SECTION 9: WATER SHORTAGE CONTINGENCY PLAN

The Water Shortage Contingency Plan is included as Appendix F.

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SECTION 10: DEMAND MANAGEMENT MEASURES

This section describes the SFPUC's efforts to promote water conservation and to reduce demand on water supply. Several demand management measures, including metering, public education and outreach, and water conservation program coordination, are addressed below.

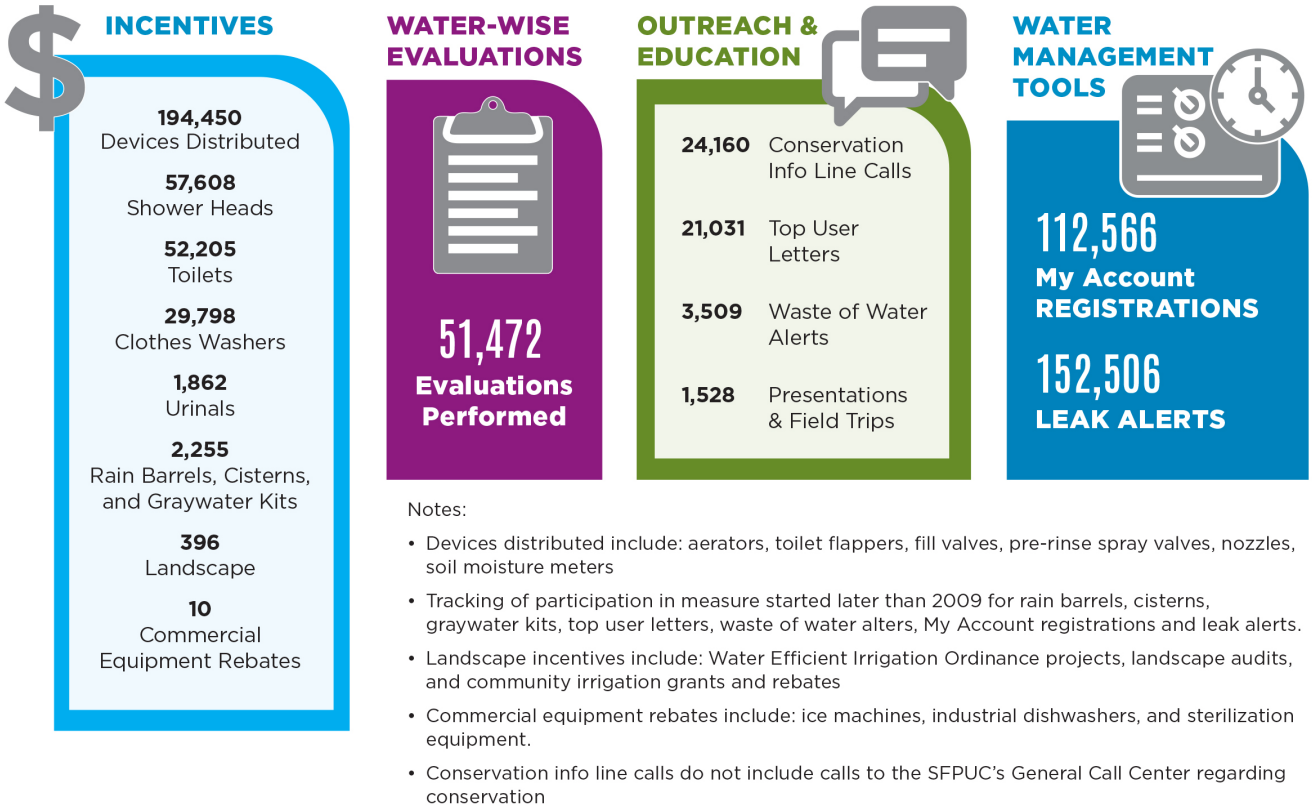
10.1 RETAIL WATER CONSERVATION PROGRAM

The SFPUC's retail water conservation program combines financial incentives, technical assistance, water management tools, education and outreach, and mandates. The SFPUC will continue to implement all these program elements throughout this UWMP planning horizon and beyond. Between 2005 and 2025, the SFPUC evaluated and implemented over 80 conservation measures and mandates, helping customers significantly reduce water use over the past 20 years. Current conservation measures and mandates include: (1) conservation best management practices proven effective by major water utilities and efficiency experts nationwide; (2) measures validated by third-party studies to deliver water savings and customer benefits; and (3) measures tailored to the site conditions and characteristics unique to San Francisco's retail water service area.

The SFPUC established its retail water conservation program in 2004 with modeled water savings and goals. In 2010, it reassessed the program to incorporate updated demographic data and new regulations affecting retail water use trends. This work informed the 2011 Retail Water Conservation Plan, which established a five-year review cycle for evaluating and updating the conservation program. The Retail Water Conservation Plan is a voluntary document outlining the SFPUC's planned conservation activities over the next 25 years. During the 2011, 2015, 2020, and 2025 updates, the SFPUC analyzed all existing measures, potential new measures, and previously discontinued measures to ensure the program remained effective and current.

The SFPUC estimates "past savings" from its conservation programs included in its conservation savings model and efficient plumbing codes to be approximately 151,415 AF (49,339 MG or 7.1 MGD) between 2005 (the year the SFPUC developed its first conservation forecast model) and 2024. "Future savings" are estimated to be 123,636 AF (40,287 MG or 4.4 MGD) between 2025 and 2050. The future savings reflect anticipated savings from modeled measures described in this section, including anticipated savings from the Onsite Water Reuse Program. This estimate does not reflect water savings from conservation measures that the SFPUC offers but does not model, or from SFPUC efforts that are not part of its conservation program but may generate potable water savings, including its supply-side water loss program, recycled water program, and stormwater management program. Additionally, the conservation measure savings that the SFPUC modeled and presented in its 2025 Retail Water Conservation Plan do not reflect potential savings from short-term demand reduction actions that could be implemented if the SFPUC had to activate its WSCP. The SFPUC has provided water-saving assistance to many thousands of residential and non-residential customers. Figure 10-1 highlights the SFPUC's water conservation accomplishments between 2010 and 2025.

Figure 10-1. Summary of SFPUC's Water Conservation Achievements



Notes:

- Devices distributed include: aerators, toilet flappers, fill valves, pre-rinse spray valves, nozzles, soil moisture meters
- Tracking of participation in measure started later than 2009 for rain barrels, cisterns, graywater kits, top user letters, waste of water alters, My Account registrations and leak alerts.
- Landscape incentives include: Water Efficient Irrigation Ordinance projects, landscape audits, and community irrigation grants and rebates
- Commercial equipment rebates include: ice machines, industrial dishwashers, and sterilization equipment.
- Conservation info line calls do not include calls to the SFPUC's General Call Center regarding conservation

The SFPUC's current conservation measures and mandates fall into two categories:

1. Customer assistance measures and water efficiency mandates, such as evaluations, site usage reports and tools, free devices, education and outreach, and mandates, that the SFPUC expects to continue through the 2050 planning horizon with no defined end date;
2. Incentive-based measures with specific end dates, which vary based on factors such as plumbing code changes and market saturation levels.

Together, the measures and mandates support the SFPUC's strategy for capturing remaining water-saving opportunities. These measures and mandates include, but are not limited to, the following:

- Water-wise evaluations for customers to improve water efficiency, reduce irrigation runoff, and identify outdated plumbing fixtures.
- Free high-efficiency plumbing devices, such as showerheads, faucet aerators, garden spray hose nozzles, soil moisture meters, and toilet leak repair parts, to help customers conserve water.
- Rebates and financial incentives for customers to install water-efficient clothes washers, toilets, irrigation controllers, soil moisture meters, and other devices.
- Rebates to encourage non-residential facilities to replace or upgrade large indoor water-using equipment and systems.

- Rebates for installing rain barrels, cisterns, and simple graywater systems for subsurface irrigation at small residential sites.
- Grants for large-scale onsite reuse systems.
- Leak alert notifications for single family, multi-family, irrigation, commercial, and municipal customers when the SFPUC detects constant or unusual water use that may indicate a leak.
- Large landscape grant and community garden assistance to help customers with irrigated landscape areas over 10,000 square feet implement irrigation and planting improvements that reduce water use.
- Courtesy monthly water budget reports for irrigation customers to promote efficient irrigation practices.
- Demonstration garden with youth and adult training to promote water-efficient gardening.
- Affordability initiatives that help ensure all residents have access to essential utility services, including the Customer Assistance Program. In response to historic COVID-era arrearages, the SFPUC secured state and federal relief funds, streamlined enrollment to expand access to discounts, and piloted an arrearage management program offering substantial bill reductions for low-income residents in the most cost-burdened neighborhoods of the city.
- The Waste of Water Program restricts inefficient outdoor water use practices, such as irrigating during rain, irrigation that causes runoff, and watering of nonfunctional turf on City and commercial properties, paired with outreach and notices to encourage more water-efficient practices.
- An online customer portal that helps customers view and pay their bills and track hourly, daily, weekly, and monthly water use to identify water use patterns and unusual spikes in water use.
- Direct outreach to top large residential and non-residential water users about ways to conserve water and financial incentives to save money on their utility bills.
- A public information phone line allows conservation staff to answer calls, provide guidance, conduct targeted outreach to promote Conservation Programs and to address ongoing leaks and water waste. Staff can help callers in any language through an on-demand phone interpretation vendor.
- A mix of demand-side, customer-focused water-saving strategies, including voluntary incentives, assistance services, water management tools, education and outreach, and indoor and outdoor water efficiency mandates.

10.2 RETAIL DEMAND MANAGEMENT MEASURES

The SFPUC's demand management measures are guided by a combination of SFPUC and City policy directives and evolving state and local water efficiency requirements. Since 2009, state requirements for urban water suppliers have progressed from (1) meeting Best Management Practices (BMPs) to (2) meeting per capita water reduction targets under the Water Conservation Act of 2009 (SB X7-7) to (3) complying with the SWRCB's Making Conservation a California Way of Life Framework (effective January 1, 2025), which sets efficiency standards for indoor water use, outdoor water use, supply-side water loss, and requires urban water suppliers to provide a broad range of BMPs for commercial, industrial, and institutional top water users.

San Francisco has implemented a range of local requirements to promote water efficiency, including standards for plumbing fixtures, landscapes, and irrigation systems, as well as rules limiting outdoor water waste. New multi-family buildings must also include sub-metering to track individual water use. The SFPUC sets its own conservation and sustainability targets. One key goal, stemming from the Level of Service Goal, is to maintain average in-City residential water use below 45 gallons per person per day across both indoor and outdoor uses. Historically, the

SFPUC has met the state's BMP requirements for the years they were in effect, remained well below its SB X7-7 per capita water use target for 2020, and continued to comply with the SWRCB's Making Conservation a California Way of Life efficiency standards. More detailed information on the demand management measures planned for the next five to 25 years can be found in the 2025 Retail Water Conservation Plan at **www.sfpuc.gov/savewater**.

The SFPUC has implemented conservation measures for decades. Through sustained and intensive efforts to promote conservation and educate retail customers on efficient water use, San Franciscans have consistently maintained one of the lowest per capita water use levels in the State. As noted in Section 4.1, FY 2024-25 gross and residential per capita consumption by in-City retail customers are 70 and 43 GPCD, respectively. Including suburban retail customers, gross and residential per capita consumption are 74 and 43 GPCD, respectively.

10.2.1 Water Waste Prevention Ordinances

10.2.1.1 Past Implementation

During the 1987-92 drought, the SFPUC enacted numerous additional water use restrictions to address the severe water shortage. Following that drought, the SFPUC kept several restrictions in place to support long-term conservation. In 2016, the SFPUC added permanent water waste restrictions to Section E, Rule 12 of the SFPUC's Rules and Regulations Governing Water Service to Customers. The SFPUC has since updated and expanded these restrictions multiple times in response to subsequent State requirements, including changes in 2022 and 2023. These restrictions, excerpted below and in the WSCP, are listed in the Rules and Regulations Governing Water and Electric Services.

1. The customer will be in violation of the SFPUC's Water Waste Restrictions if the customer is found to be using water in the following ways:
    a) Application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots or structures
    b) Use of hoses for any purpose without a positive shut-off valve
    c) Use of potable water to wash sidewalks, driveways, plazas and other outdoor hardscapes for reasons other than health, safety, or to meet City of San Francisco standards for sidewalk cleanliness and in a manner that causes runoff to storm drains and sewer catch basins
    d) Use of single pass cooling systems, fountains and decorative water features, and commercial car washes
    e) Application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall
    f) Irrigation with potable water of ornamental turf on public street medians
    g) Use of potable water for backfill consolidation around non-potable piping, soil compaction, or dust control for construction or demolition projects within the boundaries of the City and County of San Francisco, if recycled water, well water, or groundwater are available. Recycled water must be used in accordance with State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, San Francisco Department of Health, and SFPUC standards, regulations and requirements. The SFPUC will review the customer's fire hydrant meter application and allow temporary water supply from fire hydrants, if SFPUC determines that recycled water, well water, or

groundwater are not available for the construction or demolition project

h) Serving drinking water other than upon request at eating or drinking establishments, including restaurants, hotels, cafes, cafeterias, bars or other public places where food or drink are served

i) To promote conservation, hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily and display notice of this option in guestrooms

2. Any homeowner's association or community service organization or similar entity is prohibited from:
   a) Taking or threatening to take any action to enforce any provision of the governing documents or architectural or landscaping guidelines or policies of a common interest development where that provision is void or unenforceable under section 4735, subdivisions (a) and (b) of the Civil Code
   b) Imposing or threatening to impose a fine, assessment, or other monetary penalty against any owner of a separate interest for reducing or eliminating the watering of vegetation or lawns during a declared drought emergency, as described in section 4735, subdivision (c) of the Civil Code
   c) Requiring an owner of a separate interest upon which water-efficient landscaping measures have been installed in response to a declared drought emergency, as described in section 4735, subdivisions (c) and (d) of the Civil Code, to reverse or remove the water-efficient landscaping measures upon the conclusion of the state of emergency

The following restriction on the use of potable water for irrigation of nonfunctional turf is from Section F, Rule 17 of the SFPUC Rules and Regulations Governing Water Service to Customers, and is provided below:

1. The Rules and Regulations would prohibit the use of potable water for irrigating nonfunctional turf on the following property types, in accordance with this schedule:
   a) January 1, 2027, for properties owned by the Department of General Services
   b) January 1, 2027, for properties owned by local governments, the state and local governments, local or regional public agencies, and public water systems, but excluding such property located within a disadvantaged community
   c) January 1, 2028, for all commercial, industrial, and institutional properties
   d) January 1, 2029, for all common areas of properties of homeowners' associations, common interest developments, and community service organizations or similar entities
   e) January 1, 2031, for properties owned by local governments, local public agencies, and public water systems in a disadvantaged community or the date upon which a state funding source is made available to fund conversion of nonfunctional turf on these properties to climate-appropriate landscapes, whichever is later

2. In addition, as required by AB 1572, the Rules and Regulations require commercial, industrial, and institutional property owners, homeowners' associations, common interest developments, and community service organizations with more than 5,000 square feet of irrigated area to certify compliance with AB 1572 to the State Water Resources Control Board. Commercial, industrial, and residential property owners must submit certifications beginning June 30, 2030, and every three years thereafter through 2039. Homeowners' associations, common interest developments, and community service organizations must submit certifications beginning June 30, 2031, and every three years thereafter through 2040.

The SFPUC directs the public to report potential water waste violations through San Francisco's 311 system. Staff review and respond to these reports regularly. When the SFPUC receives or observes a water waste violation, the SFPUC notifies the customer or entity and explains the corrective action needed. Notifications may include letters, phone calls, and/or an inspector visit. Customers and other entities subject to the SFPUC's Water Waste Restrictions may face enforcement actions such as fines on their water bill, installation of flow restriction devices, injunctions, or other appropriate actions.

Section F of the SFPUC's Rules and Regulations Governing Water Service to Customers, implemented through the City's Water Efficient Irrigation Ordinance, took effect in 2010 and was updated in 2015 and 2022. Section F establishes water efficient irrigation requirements and prohibits runoff from landscapes of any size caused by low head drainage, overspray, broken irrigation hardware, or other conditions that allow water to flow onto adjacent property, sidewalks, roadways, parking lots, or structures.

10.2.1.2 Planned Implementation

The SFPUC will continue to implement the water waste restrictions (Section E) and water efficient irrigation rules (Section F) in its Rules and Regulations Governing Water Service to Customers, as discussed above, and continue to monitor and respond to reports of water waste.

10.2.2 Metering

10.2.2.1 Past Implementation

All in-City retail customers have been metered and billed by volume since 1916. Suburban retail customers are also fully metered and are billed by volume. There are approximately 182,000 water meters in the City and about 225 water meters in the suburban retail service area.

In 2018, the SFPUC completed major deployment of its Automated Water Meter Program, upgrading in-City and suburban retail water meters with wireless advanced metering technology. The SFPUC was the first major water utility in California to implement a system of this scale. By 2025, 99% of retail water meters were automated. This automated water meter reading system enabled new tools for tracking customer water use and identifying high or unusual consumption through (1) My Account, an online bill management system and water use portal and (2) the Leak Alert Program.

The SFPUC launched My Account in May 2014 and later upgraded it to display hourly and daily water use data from automated water meters. The SFPUC plans to further update and replace its online customer portal by 2027 to expand customer interaction and water use tracking. The SFPUC also launched a Leak Alert Program in April 2015 and has since expanded it to provide courtesy alerts to all customer types when water usage patterns suggest a potential leak.

Sub-metering requirements come from the San Francisco Green Building Code and Section F of the SFPUC's Rules and Regulations Governing Water Service to Customers. Under the Green Building Code, new non-residential buildings must install a separate sub-meter for each individual building tenant expected to consume more than 1,000 gallons per day. For new non-residential buildings over 50,000 square feet, a sub-meter must be installed for each tenant expected to consume more than 100 gallons per day. Section F requires non-residential projects with 1,000 to 5,000 square feet of landscape area to install a privately-owned sub-meter or a utility

landscape meter, and projects with more than 5,000 square feet of landscape must install a utility landscape water meter. State regulations effective in 2018 require dwelling units in new apartment buildings to be individually metered or sub-metered and require tenants to be billed accordingly. In response, the SFPUC works with the San Francisco Department of Building Inspection and Department of Public Health to require proof of sub-metering before approving water service requests for new multi-family residential buildings.

10.2.2.2 Planned Implementation

The SFPUC is in the process of replacing a small number of old meters with automated meters. The SFPUC will also continue to expand its Leak Alert Program.

10.2.3 Conservation Pricing

10.2.3.1 Past Implementation

The SFPUC sets its water rates to recover the proportional cost to provide water service to parcels within its retail service area. The volumetric component of SFPUC's water rates may send a price signal, which may, in turn, prompt some customers to seek ways to reduce their monthly water use to save money on their water bills. The SFPUC set its water rates for both single family and multi-family residential accounts with a two-tier increasing block rate structure, where the Tier 1 threshold is 4 CCF for single-family and 3 CCF for multi-family. Non-residential (e.g., commercial) water rates are set with a uniform rate structure. The SFPUC may apply a drought surcharge on volumetric water rates following a Commission resolution declaring a stage of water delivery reduction in accordance with the WSCP. The SFPUC recognizes water rates can indirectly impact consumer behavior and takes those potential effects into account in water usage projections, as described in Section 4.1.2.

10.2.3.2 Planned Implementation

The SFPUC adopted a new rate schedule effective July 1, 2026. The SFPUC conducts an independent rate study every four to five years to inform the next rate schedule.

10.2.4 Public Education and Outreach

10.2.4.1 Past Implementation

Throughout the year, the SFPUC promotes its conservation services and assistance programs through social media, digital and print newsletters, bill inserts, email blasts, direct mailings, local media and trade publications, and its website. The SFPUC also periodically contacts top residential and non-residential water users to encourage efficiency, alert them of potential plumbing leaks, and offer free Water Wise Evaluations. The SFPUC's newsletters, both print and digital, almost always feature conservation-related articles or water-saving tips.

The SFPUC participates in community events and presentations on water use and conservation that reach residents, businesses, and targeted industry groups. Water conservation staff and education partners also conduct in-class presentations during the school year. These programs align with State curriculum standards and often include place-based or outdoor learning opportunities that complement classroom instruction. The SFPUC provides free teacher resources, including guides, lesson plans, fact sheets, and activity sheets on water use and conservation. The SFPUC maintains several demonstration gardens that offer public access and organized programming for adults and youth, showcasing water-efficient gardening and irrigation practices.

Table 10-1 provides a summary of key educational and outreach activities conducted between FY 2020-21 and FY 2024-25.

Table 10-1. Summary of SFPUC Retail Educational and Outreach Activities Over Five Years (Conducted between FY 2020-21 and FY 2024-25)

Activity	Total
School Presentations and Field Trips	358
Conservation Information Line Calls	6,482
Waste of Water Reports	885
Leak Incidents Notified by Alerts	69,313
Top User Letters	15,233
My Account Online Portal Users	Over 112,586

10.2.4.2 Planned Implementation

The SFPUC plans to continue public education and outreach efforts over the next five years and beyond to promote water efficiency among residents, businesses, and customers.

10.2.5 Management of System Losses

10.2.5.1 Past Implementation

The SFPUC manages system losses primarily through asset renewal and proactive leak management. The Linear Assets Management Program replaces and upgrades distribution system pipelines and customer service connections across roughly 1,280 miles of drinking water mains in the City. A planning analysis determined that improving about 15 miles of pipeline per year is necessary to meet the SFPUC's Level of Service goals for uninterrupted service. These improvements include pipeline replacement, rehabilitation, and cathodic protection across all pipe sizes to extend or renew pipeline useful life.

The SFPUC has a program to replace assets between the water main and the customer's service connection when they reach their end of life. These assets include (1) 1-inch to 8-inch service pipes made of cast iron, galvanized steel, or plastic to be replaced with copper or ductile iron; (2) broken meter boxes; (3) outdated or undersized meters and associated piping; and (4) related sidewalk and roadway restoration.

The SFPUC has completed several pilot programs for proactive leak detection by testing different approaches. Proactive leak management uses acoustic leak detection to accurately pinpoint leaks in mains of all material types. In addition, the SFPUC prioritizes leak repairs to meet the Level of Service goals and to reduce real water losses.

The SFPUC completed the Linear Assets and Initial 10-Year Replacement and Renewal Plan in November 2012, which includes a Linear Assets Prioritization Technical Memorandum. The memorandum documents the methodology used to assess pipeline condition and the risk-based approach to estimate a pipeline's risk score. The risk score is a function of a pipeline's likelihood of failure and its consequences of failure. Using the risk score and pipeline category (e.g., distribution, feeder or transmission), pipeline segments were identified and prioritized as part of the replacement and renewal plan, which addresses non-surfacing leakage. The Automated Water Meter Program (described in Section 10.2.2) involves the regular maintenance and operation of water meters, including

their appurtenances. Regular maintenance and operations of water meters help ensure water meter accuracy and data quality in accounting for non-revenue water.

The SFPUC also references the American Water Works Association's optimization goal of fewer than 15 main breaks and leaks per 100 miles of pipe per year. Table 10-2 summarizes historical main break and leak data from FY 2020-21 through FY 2024-25.

Several main breaks result from incidental construction damage, typically when an excavator strikes a water main or service connection. To reduce these incidents, the SFPUC is working to (1) improve procedures and documentation for marking pipes, (2) expand training for inspection staff and other departments to better monitor contractors, and (3) develop standards for project sponsors to better protect water facilities.

Table 10-2. Summary of Historical Leaks and Breaks within In-City Retail Distribution System

	2021	2022	2023	2024	2025
Total number of leaks and breaks	141	163	188	108	140
Leaks and breaks compared to the previous fiscal year	-	+16%	+15%	-43%	+30%
Number of leaks and breaks per 100 miles	11.00	12.71	14.66	8.42	10.92

10.2.5.2 Planned Implementation

The SFPUC has ongoing water loss reduction efforts planned to manage both real and apparent water losses.

To manage real water losses, the SFPUC will be continuing to implement a lift-and-shift acoustic leak logger program for proactive leak detection, select equipment for optimized pressure monitoring, and work toward meeting the leak registry requirements set by the State.

To manage apparent water losses, the SFPUC will be engaging in the following efforts:

- Implementation of in-situ large meter mechanical diagnostics and flow testing,
- Preventative maintenance of large meters via replacements of unitized measuring elements,
- Continuous replacement of small meters due to issues with battery reception, and
- Meter manifold conversions.

10.2.6 Water Conservation Program

10.2.6.1 Past Implementation

The SFPUC Water Conservation Section includes 12 full-time positions under the direction of a Water Conservation Section Manager. Conservation staff implement various programs for residential, landscape, commercial, industrial, and institutional customers. The Water Conservation Program offers incentives, services, and educational assistance, including rebates for high-efficiency fixtures, grants for large landscape irrigation upgrades, and free water-efficient devices. Services include conservation surveys, landscape plan review, and school education programs. The SFPUC also provides tools and notifications to help customers understand and manage their water

use, including an online portal and automatic leak alerts. Table 10-3 shows a summary of participation in key water conservation programs between FY 2021-22 and FY 2024-25.

Table 10-3. Summary of Key Water Conservation Programs Over Five Years (Conducted between FY 2021-22 and FY 2024-25)

Activity	Total
Surveys	9,316
Toilet Installations	3,590
Washer Rebates	1,342
Showerheads Distributed	2,912
Landscape and Irrigation Meter Grants	12
Rain Barrel Discounts	701
Water-Saving Devices Distributed	7,211

10.2.6.2 Planned Implementation

The SFPUC will continue evaluating and adapting its conservation measures to respond to changing conditions and regulations. This flexible approach has helped reduce water demand even as the population has grown. Moving forward, the SFPUC will rely on a mix of demand-side, water-saving strategies, including voluntary incentives, assistance services, tools that help customers track and manage their water use, education and outreach, and indoor and outdoor efficiency requirements. Core customer assistance measures will continue to include water evaluation surveys, site usage reports, free devices, landscape water budgets, and public education and outreach. Fixture-based incentives, such as rebates for toilets, clothes washers, rain barrels and cisterns, residential graywater system parts, and large commercial equipment, will remain in place over the next five years. The SFPUC also plans to introduce new incentives, including rebates on residential on-demand recirculating hot water pumps and weather-based irrigation controllers.

10.2.7 Other Demand Management Measures

In addition to demand management measures administered through the Water Conservation Section, the SFPUC implements other programs that contribute to potable water savings. These programs include (1) the Onsite Water Reuse Program that requires new construction over a certain size to use available graywater, rainwater, and foundation drainage for toilet and urinal flushing and irrigation; (2) the Stormwater Management Program that mandates and incentivizes the use of stormwater for irrigation; and (3) a high bill adjustment program that may reduce water waste through faster leak repair.

10.3 WHOLESALE DEMAND MANAGEMENT MEASURES

BAWSCA is the only organization authorized to conduct regional water supply reliability planning for its member agencies, and it coordinates water conservation programs and services on their behalf. While the SFPUC may not provide direct financial assistance to individual Wholesale Customers for conservation programs, the WSA allows the SFPUC (at BAWSCA's request) to place a water management charge on Wholesale Customer billing statements and transfer the collected revenue to BAWSCA to support the conservation programs within each

Wholesale Customer's service area. Through its Regional Water Conservation Program, BAWSCA implements a range of measures that help its member agencies' customers use water more efficiently. These efforts include regional initiatives, water-efficient landscape education, and turf removal incentives. More information about BAWSCA-coordinated conservation measures in the SFPUC's wholesale service area is available at **bawsca.org**.

10.3.1 Metering

The Wholesale Customers are fully metered, and about 97% of wholesale meters have wireless transmitters that send quarter-hourly water consumption through a cellular endpoint without requiring a fixed network infrastructure. The remaining 3% that are not on a wireless transmitter are either not compatible with the advanced metering transmitter or are in an area where no cellular coverage exists (i.e., Pilarcitos Creek watershed). Advanced metering software analyzes and records this data, allowing both the SFPUC and the Wholesale Customers to view quarter-hourly, hourly, and daily water consumption instead of waiting for monthly billing reads. The software also provides custom alerts for system issues or unusual consumption patterns, such as leaks, supporting demand management across the Wholesale Customer service area.

The SFPUC's ongoing preventative maintenance program ensures that the Wholesale Customers' meters are regularly inspected, maintained, and calibrated. In 2023, the SFPUC Water Supply and Treatment Division published its Water Meter Maintenance and Testing Procedures Manual, which describes the maintenance, testing, and calibration procedures for all RWS and large customer meters. The SFPUC updated this manual in 2024 and continues to implement its procedures as part of its preventative maintenance program.

10.3.2 Public Education and Outreach

The SFPUC provides technical and administrative assistance for public education and outreach campaigns to BAWSCA and the Wholesale Customers as requested. From 2021 to 2022, the SFPUC assisted BAWSCA and the Wholesale Customers with a regional drought awareness and public outreach campaign that covered the Wholesale Customer service area and retail service area. The SFPUC also coordinated smaller, summer conservation awareness campaigns with the San Francisco Giants in 2023 and 2025. These efforts included in-stadium and direct messaging to Giants fans, which is generally assumed to reach people throughout the SFPUC's wholesale region.

10.3.3 Water Conservation Program Coordination and Staffing Support

BAWSCA manages a Regional Water Conservation Program for Wholesale Customers (see **bayareaconservation.org**). The program employs several different conservation measures and is designed to support BAWSCA member agencies' efforts to encourage efficient water use among the retail customers in their respective service areas.

Under the terms of the WSA, the SFPUC may provide staff support for certain Wholesale Customer conservation activities and develop regional conservation programs funded jointly by retail and Wholesale Customers in coordination with BAWSCA.

10.3.4 Asset Management

In the early 1990s, the SFPUC initiated a Pipeline Inspection Program for the 350 miles of water transmission pipelines in the RWS. Because the RWS does not include distribution system components, the SFPUC does not inspect those components via this asset management program.

Routine inspections are preventive maintenance measures that enable early detection of localized pipe water loss to prevent leaks. The SFPUC also uses the data collected during inspections to determine how to prioritize pipeline repair, rehabilitation, and replacement projects.

Through the Pipeline Inspection Program, the SFPUC inspects every water transmission pipeline in the RWS on a 20-year cycle (except for prestressed concrete cylinder pipes, which the SFPUC inspects every 10 years to monitor condition changes). After every 20-year (or 10-year) cycle, the schedule repeats, ensuring regular inspection of all major pipeline sections. The SFPUC typically conducts inspections year-round, with no more than one major pipeline section out of service at any given time.

The SFPUC has a goal to inspect one pipeline section per quarter, averaging 10 to 12 miles per year. In 2020, the inspection rate decreased to approximately 3.6 miles due to health and safety concerns related to confined space work during the COVID-19 pandemic, but the inspection rate returned to an average of 10 to 12 miles per year in 2023. Recently, the SFPUC revised its inspection approach. Instead of inspecting shorter sections quarterly, the SFPUC will take longer sections out of service for inspection twice per year. This adjustment reduces the overall frequency of inspections but minimizes operational disruptions for both the SFPUC and the Wholesale Customers.

In addition to inspections, SFPUC staff regularly compare production volumes with customer consumption to help identify the leakage rate.

10.3.4.1 Past Implementation

The major focus of asset management for the RWS was the Water System Improvement Program (WSIP). As of June 30, 2025, the regional portion of WSIP was 99.3% complete. With most WSIP projects concluded, the SFPUC has shifted its focus to maintaining the aging infrastructure within the RWS. In the last five years, the Water Enterprise Capital Improvement Program (CIP) has undertaken system improvements, including significant pipeline and tunnel construction, rehabilitation, and replacement projects. Since 2020, the completed Water Enterprise CIP projects include:

- Replacement of 1.5 miles of the 54-inch San Andreas Pipeline No. 2 in San Bruno due to severe corrosion of lock bar steel pipe segments.
- Replacement of the Town of Sunol's potable and raw water transmission pipelines across State Highway I-680, prompted by severe pitting and recurring leaks.
- Sliplining of Bay Division Pipelines Nos. 3 and 4 in Santa Clara, necessitated by the addition of a new railroad track above both pipelines.

In addition to pipeline replacement, these CIP projects included installation of new access manholes to improve future inspection and maintenance and upgrades to existing appurtenances to meet current water quality standards.

10.3.4.2 Planned Implementation

During WSIP's implementation, the SFPUC replaced approximately half of the RWS transmission pipelines. The SFPUC will prioritize the remaining transmission lines for replacement based on findings from the Pipeline Inspection Program discussed above and additional factors such as material type, age, redundancy, leak history, and water quality issues.

The SFPUC also continues to enhance its Safe Pipeline Entry Program, which incorporates additional isolation valve installations into pipeline replacement projects and emphasizes the use of unmanned inspection technologies.

Under the Water Enterprise Capital Improvement Program, several major pipeline rehabilitation and replacement projects are currently in the planning or design phase, with construction anticipated to begin within the next five to 10 years. These projects include:

- Rehabilitation of a key segment (Reach 5) of Crystal Springs Pipeline No. 2, involving the replacement of 3.8 miles of coal tar lining with cement mortar lining, upgrading approximately 30 appurtenances to meet current standards, and improving access and shutdown flexibility for maintenance by installing manway structures and a new 48-inch diameter valve on San Andreas Pipeline No. 1 (SAPL1) near Baden Pump Station.
- Internal lining repairs for Bay Division Pipelines Nos. 1-4, which will involve the removal of corrosion at joints and damaged mortar lining, cleaning of metal surfaces, construction of new mortar lining, and removal of debris and sediment within the pipe. New isolation valves will be installed to provide permanent safe entry measures for pipelines.
- Targeted rehabilitation or replacement of 1.3 miles of prestressed concrete pipe on Bay Division Pipeline No. 4, due to the high number of broken prestressed wires posing leak or rupture risks.
- Sliplining of sections of Bay Division Pipelines Nos. 1 and 2 beneath the Caltrain railroad tracks in Redwood City to address deterioration in the existing pipe protection system.

10.3.5 Assistance to Wholesale Customers

BAWSCA is the only organization authorized to conduct regional water supply reliability planning for its member agencies. See Section 10.3 for a summary of how the SFPUC may provide conservation program assistance to Wholesale Customers.

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SECTION 11: UWMP ADOPTION, SUBMITTAL, AND IMPLEMENTATION

This section describes the SFPUC's adoption, submittal, and implementation of its 2025 UWMP. As noted below, the SFPUC's UWMP checklist is also provided in Appendix H to facilitate DWR's review of the 2025 UWMP.

11.1 NOTICE OF PLAN PREPARATION AND PUBLIC HEARING

Under Water Code Sections 10620 and 10621, every urban water supplier that is required to prepare a UWMP must update it at least once every five years. At least 60 days before holding a public hearing on the UWMP update, the supplier must notify each city and county to which the supplier provides water that it will be reviewing and considering amendments to the UWMP. The SFPUC sent this required notification for the 2025 UWMP to the cities or counties it provides water to on February 12, 2026, which was at least 60 days before the public hearing.

Water Code Section 10642 requires the urban water supplier to make the UWMP available to the public and hold a public hearing before adopting the plan. Prior to the public hearing, the supplier must publish a notice once a week for two successive weeks. The SFPUC coordinated the publication of the required public hearing notices for the 2025 UWMP, which were published in a local newspaper on March 30 and April 6, 2026. A copy of this notice is included in Appendix B.

11.2 PUBLIC HEARING AND ADOPTION

The SFPUC prepared the Draft 2025 UWMP and conducted a public hearing on April 14, 2026 at the regular SFPUC Commission meeting that began at 1:30 PM. The SFPUC Commission meets at San Francisco City Hall, Room 400, 1 Dr. Carlton B. Goodlett Place, San Francisco, CA 94102. Following that meeting, the SFPUC prepared a final draft of the 2025 UWMP and brought it back to the SFPUC Commission for consideration of adoption on June 23, 2026. A copy of the SFPUC Commission resolution adopting this 2025 UWMP will be provided in Appendix G.

11.3 PLAN SUBMITTAL, AVAILABILITY, AND IMPLEMENTATION

Within 30 days of SFPUC Commission approval, SFPUC staff will electronically submit the adopted 2025 UWMP to DWR through the Water Use Efficiency online submittal website at **wuedata.water.ca.gov**. The SFPUC will also provide an electronic copy on compact disk to the California State Library and by email to the cities or counties to which the SFPUC provides water. Additionally, the adopted 2025 UWMP will be available for public review on the SFPUC's website at **www.sfpuc.gov/uwmp**.

The SFPUC will implement the adopted 2025 UWMP in accordance with the California Urban Water Management Planning Act. Following adoption, the SFPUC will also continue to implement the water supply planning programs and projects identified in this 2025 UWMP, including those related to conservation, groundwater, recycled water, onsite water reuse, and alternative water supply planning.

11.4 UWMP CHECKLIST

The SFPUC's UWMP checklist is provided in Appendix H to facilitate DWR's review of the completeness of this 2025 UWMP. The UWMP checklist is organized by subject matter. In addition, complete sets of the submittal tables prescribed by DWR are provided in Appendix A.

2025 URBAN WATER MANAGEMENT PLAN

FOR THE CITY AND COUNTY OF SAN FRANCISCO

June 2026

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission