

Alternative Water Supply Program Quarterly Report

March 2023



Photo: Hetch Hetchy Reservoir, January 2023

In this photo: Winter storms following three years of severe drought demonstrate the extreme weather events that continue to become more common in recent times. Planning for and investing in diverse supplies and expanded storage to augment and stretch our surface water and groundwater sources can help reduce the impact of water supply uncertainties in the future.

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Report Overview & Organization

The Quarterly Report for the Alternative Water Supply (AWS) Program provides an update to the SFPUC Commission, stakeholders, and the public on the status of regional water supply, storage, and conveyance projects that are being planned to help address anticipated supply shortages in the SFPUC's service area. This report also provides information on local retail service area projects and project opportunities in the San Joaquin Valley. The Quarterly Report provides updates every three months on program activities, but also contains discussion around relevant planning considerations, as well as background information so it can serve as a standalone document for the first-time reader. **This report provides updates on program and project-related activities that occurred between December 2022 and February 2023.** The Quarterly Report is divided into three sections: Section 1. Program Highlights and Updates; Section 2. Status of Projects; and Section 3. Program Fundamentals.

Section 1. Program Highlights and Updates. This section provides a discussion of program-level planning activities and considerations. Within this section, there is a discussion around a different *Quarterly Highlight* each quarter. The highlight provides detail on a key theme and information on how it relates to the program, in order to provide context for future decision-making. Also included in this section is an update on *Ongoing Program Activities*.

For this report's *Quarterly Highlight*, there is a **qualitative discussion of the cost and benefits of investing in AWS projects.** While detailed cost estimates are still in development for the projects, it is certain that AWS will be more expensive than many traditional SFPUC capital projects because of the technical, institutional, and operational complexities that are inherent to them. This section describes a few recent signals and trends that should be considered as these decisions are contemplated in the months and years ahead.

Section 2. Status of Projects. This section provides a summary of activities associated with each of the projects being evaluated as part of the AWS planning efforts. **The project status updates are broken out to include three to five sections based on their relevance:** *Project Background*, which provides a brief summary of the key elements and objectives of each project; *Current Planning Considerations*, which are included for context regarding the near-term activities for a project; and sections on *Activities This Quarter* and *Upcoming Activities* that are updated each quarter. **To provide a sense of the institutional complexity of the project, a schematic on *Project Partners & Interests* is included at the outset of each project section where the SFPUC is working with external partners.**

Section 3. Program Fundamentals. This reference section provides background information on AWS planning activities. It includes information on the rationale, priorities, structure, challenges, opportunities, schedule, and resources related to the program. **For the first-time reader, this section provides a complete preface to the AWS Program and may be a useful starting point in reading this Quarterly Report.**

Section 1. Program Highlights and Updates

1.1 Program Purpose (*UPDATED*)

The objective of the Alternative Water Supply (AWS) Program of the San Francisco Public Utilities Commission (SFPUC) is to improve reliability in meeting retail and wholesale demands on the Regional Water System (RWS) in dry years through the 2045 planning horizon. As a shortfall is anticipated, the AWS Program sets out to try to fill the gap between RWS supply availability and customer demand projections by augmenting existing surface water supplies and groundwater sources with projects that increase long-term dry year availability. The AWS Program looks to new and diverse or “alternative” water supply options such as groundwater banking, surface water storage expansion with a potential for diverse water supply sources, water transfers, purified water¹ (potable reuse), and desalination as well as technological innovations and other tools that can increase supply or reduce demand. The AWS Program is intended to supplement existing demand management and local supply projects that are already aimed at reducing reliance on the RWS in order to improve long-term water supply reliability.

The water supply shortfall is calculated as the difference between expected supply availability from the RWS in a future dry year and the anticipated cumulative demands for water from the RWS for all customers². On the supply side, availability is influenced by factors such as current and planned projects, instream flow releases and other permitting requirements, and the effect of rationing. Included in the supply availability from the RWS is the effect of implementing the State Water Resources Control Board’s San Francisco Bay/Sacramento-San Joaquin Delta Estuary Water Quality Control Plan (Bay-Delta Plan) as amended in 2018. On the demand side, the SFPUC considers a) its current and potential obligations to all customers and b) projected demand for RWS deliveries to all customers under both near-term (2025) and long-term (2045) scenarios. The near-term scenario has been added to illustrate both the urgency and magnitude of the shortfall that could exist long before 2045 demand levels are realized.

Based on the difference between the SFPUC’s anticipated total obligations³ and expected supply availability in the RWS, the water supply shortfall would be 122 mgd by 2045 (**Figure 1**). However, cumulative estimated purchase requests from customers of the RWS over the planning horizon are projected to be lower than the obligations.⁴ Comparing RWS demand

¹ Purified water is the treated effluent from a wastewater treatment plant that has undergone advanced treatment, including filtration, reverse osmosis, disinfection, and advanced oxidation.

² Customers include both retail and wholesale customers, including the Cities of San Jose and Santa Clara.

³ Anticipated total obligations include 9 mgd for San Jose and Santa Clara, who are interruptible customers. As stated in the Water Supply Agreement, the SFPUC will need to make a policy decision regarding their permanent status by December 31, 2028. For planning purposes, the AWS program includes this as an anticipated obligation in order to be able to identify and evaluate appropriate sources of supply in order to support a future decision. Section 3.4 provides additional context.

⁴ Demands for the water provided through the RWS account for savings from conservation and offsets from water supplies other than RWS and onsite water recycling.

projections and expected water supply availability, the shortfall in dry year water supplies would be 69 mgd in 2025 or 94 mgd in 2045. If purchase projections for 2045 do not materialize as anticipated, the near-term projections suggest that there would still be an imminent and significant water supply shortfall. For project planning purposes, it is still prudent to plan based on the 2045 planning horizon as capital projects can take 10 to 20 years to implement. Please refer to Section 3.3 for additional information on water supply obligations and customer demands.

Figure 1. Water Supply Shortfall in a Future Dry Year

Dry-Year Supply Available from the Regional Water System		
152 mgd <i>(assumes Bay-Delta Plan implemented as amended)</i>		
Total Existing and Potential Obligations	Total Demands on the System**	
2045	2025	2045
265 mgd (retail and wholesale) + 9 mgd (San Jose and Santa Clara)*	221 mgd	246 mgd
Water Supply Shortfall		
-122 mgd	-69 mgd	-94 mgd

*The SFPUC Commission will make a decision on whether to commit to future supply guarantees totaling 9 mgd for San Jose and Santa Clara by December 31, 2028.

**Demands reflect updated purchase projections for Wholesale Customers from BAWSCA’s FY 20-21 Annual Survey and include San Jose and Santa Clara’s demands.

There are currently six regional AWS projects being planned. They include two storage expansion projects that increase dry-year availability, one recycled water project that offsets potable groundwater supply, and three purified water projects that each provide a new source of supply, including in dry years. In addition to these regional projects that augment system supplies for all customers, this report describes opportunities for collaboration in the San Joaquin Valley and local initiatives in San Francisco to further reduce reliance on the RWS.

Planning for alternative water supplies requires a comprehensive and detailed evaluation effort that considers several interrelated challenges, many of which are different than those faced through traditional water supply planning at the SFPUC. These planning challenges include complex multi-party partnerships and approaches for integrating new supply sources into an expansive and largely homogenous water system. Additionally, as with any long-term water supply planning effort, the SFPUC must also contend with uncertainties such as new and prospective regulations, climate change and extreme weather events, and long-term demand projections. These planning challenges and uncertainties highlight the importance of being thoughtful and adaptive in planning for the AWS Program.

To minimize the risk of overbuilding, the SFPUC’s approach involves planning for existing and potential obligations and advancing projects toward implementation based on projected demands on the RWS: *Planning for obligations, building for demands*. The approach is necessarily dynamic as both supply-side and demand-side drivers continue to change over time. In parallel, the SFPUC continues to seek other demand management and alternative supply opportunities to shrink or fill the anticipated water supply gap.

As the AWS planning process continues to evolve, the intent of this report is to clearly communicate the most updated information available that can inform future decision-making. This includes information on the anticipated supply shortfall and its drivers, as well as details on projects and progress on their planning as it unfolds, on a quarterly basis. Data on water supply availability was last updated in September 2021 to reflect the Water Supply and Demand Worksheet developed by the SFPUC earlier in 2021. Customer demand projections were most recently updated in September 2022 to reflect the most current RWS purchase projections for Wholesale Customers published in the Bay Area Water Supply and Conservation Agency’s (BAWSCA) Fiscal Year (FY) 20-21 Annual Survey and updated retail demands on the RWS based on an update to the Non-potable Ordinance in San Francisco. As new supply or demand information become available, this data will continue to be updated periodically in the calculation of the anticipated water supply gap that the AWS program is designed to address.

In December 2022, BAWSCA released the Regional Water Demand and Conservation Projections Update (2022 Demand Study), which provides an update to the water demand projections in the BAWSCA service area from the 2020 Demand Study along with a sensitivity analysis to evaluate the relative significance of key variables and potential future scenarios. The 2022 Demand Study did not provide a detailed breakdown of the projected RWS water purchases, therefore there are no updates to report related to the Wholesale Customer⁵ demand projections on the RWS at this time. **Figure 1** reflects the most current demand projections for purchases from the RWS available at the time of this report, which is the FY 20-21 Annual Survey published by BAWSCA.

1.2 Quarterly Highlight (NEW)

1.2.1 Long-term Benefits and Value of AWS Projects

Previous Quarterly Reports have detailed some of the unique challenges of implementing AWS projects. These include operational considerations associated with treatment, distribution, and integration of new supplies, water quality considerations, community acceptance of new sources, and the institutional complexities of multi-party partnerships. Moreover, as a water supply shortfall is only anticipated in dry years and not in all years, the incremental value of alternative water supplies lies only in approximately 20% of years for the SFPUC, based on historic hydrology. Therefore, in addition to high capital costs, AWS projects are expected to

⁵ Wholesale Customers are the SFPUC’s wholesale customers represented by BAWSCA and have a Water Supply Agreement with the SFPUC, as well as individual contracts.

have high unit costs and high ongoing operations and maintenance costs.⁶ These projects cannot easily be compared to other SFPUC capital projects, and it is hard to justify implementation of AWS projects on the basis of cost alone. Yet, there are trends that indicate that alternative water supplies will be increasingly valuable over time.

- **Regulatory Actions:** In addition to the adoption of the Bay-Delta Plan amendments, which could result in a significant water supply reduction if implemented, there are other regulatory actions that can affect SFPUC surface water supplies in the future. The City and County of San Francisco holds senior (pre-1914) appropriative water rights to divert water from the Tuolumne River. The SFPUC's diversions and access to its Water Bank at Don Pedro Reservoir have not historically been subject to curtailments. However, during the recent statewide drought, the State Water Resources Control Board issued curtailment orders limiting SFPUC's access to these sources. It is reasonable to expect that State actions could restrict use of existing supplies again in the future.
- **Drought Frequency:** Based on DWR's hydrologic index for the San Joaquin Valley, during the past 20 years, the Valley has experienced more frequent and severe dry years than the 100 years preceding it. From Water Years 2001 to 2021, over half of the years (55%) were classified as "critical" or "dry", whereas during Water Years 1901 (the earliest year on record) to 2001, less than a third (30%) of the years were classified as such. From Water Years 1901 to 2001, there were only four dry periods lasting three or more years during the entire century, whereas between Water Years 2002 and 2021, there were three dry periods lasting three or more years. With drought frequency and severity becoming more commonplace, the utility of dry-year supply projects is likely to increase over time.
- **Demand Hardening:** State legislation that was born out of the previous drought included standardizing indoor water use efficiency with a target starting at 55 gallons per capita per day (gpcd) ratcheting further down over time. Residential per capita demands (including outdoor use) in SFPUC's retail service area have remained well below 55 gpcd since 2009 (currently at 42 gpcd) and those in wholesale service area reached a low of 60 gpcd during the drought. The SFPUC continues to implement conservation programs to minimize both indoor and outdoor retail water demands. BAWSCA has developed a "Making Conservation a Way of Life" Strategic Plan to support the wholesale customers in implementing new water use targets. The conservation analysis in the BAWSCA's 2022 Demand Study shows an overall combined water savings for the BAWSCA service area of less than 1% of annual demand reduction. While there are still additional opportunities for savings, the benefits may be outweighed by the magnitude of the shortfall. It is reasonable to expect that both demand management and supply solutions will be needed.

These trends point to a drastic change in historically occurring patterns, whether it is drought occurrences, regulatory curtailments, or a shift in water demands, and therefore calls for a

⁶ The cost details are currently being prepared and will be included in the AWS Plan that will be published by July 1, 2023.

more forward-looking approach to water supply planning. Through the AWS Program, the SFPUC is taking steps toward mitigating and managing the risk of uncertain water supply availability so it can continue to provide reliable water service to its customers. Projects are being planned in phases so that they can be scaled; implementation will be prioritized based on demands over obligations, and the SFPUC is committed to updating information as new data on supply availability or demands become available.

One of the key challenges ahead will be addressing affordability. To maintain access to high-quality water while keeping water rates affordable for all, in addition to prudent planning the SFPUC will also need to investigate creative and alternative methods of financing projects such as securing grants and low interest rate loans to fund projects, and considering public-private partnerships to design, build, and operate projects.

1.3 Ongoing Program Activity Updates

1.3.1 Status of Ongoing Coordination with San Jose and Santa Clara

Planning Considerations for San Jose and Santa Clara's Permanent Status

Planning for alternative water supplies is proceeding with the intention to be able to make the Cities of San Jose and Santa Clara permanent customers of the SFPUC by providing at least 9 mgd of additional water supply guarantees to the two cities collectively. In addition, San Jose and Santa Clara have requested that the SFPUC consider its anticipated normal year demands for RWS supply of up to 15.5 mgd; this represents 6.5 mgd in excess of the requested combined supply guarantees in years when sufficient RWS supplies are more likely to be available.

Consistent with the SFPUC's planning priorities, when evaluating potential AWS supplies, the SFPUC's existing commitments to meet instream flow requirements and meet ongoing obligations to existing permanent customers must be considered when deciding to make interruptible customers permanent or meeting increased demands of existing and interruptible customers. Distinct from San Jose and Santa Clara's all-year needs, meeting existing obligations requires securing dry-year supplies.

Since August 2020, the Bay Area Water Supply & Conservation Agency (BAWSCA) has facilitated monthly discussions with San Jose and Santa Clara to collectively consider project opportunities and interests. In addition to reviewing projects that are already listed in the AWS Program, the agencies worked together to other project opportunities that may provide multiple water supply benefits.

In July of 2022 the SFPUC, San Jose, and Santa Clara initiated a feasibility study to evaluate a purified water project concept that can potentially meet both the all-year needs of San Jose and Santa Clara and produce dry-year supplies for the benefit of all RWS customers. Progress on the analysis is described as part of the **South Bay Purified Water Project** in Section 2.1 of this report.

Section 2. Status of Projects

Staff are currently studying the feasibility of six regional AWS projects that can address the projected water supply shortfall and the priorities identified for this planning effort. Beyond these AWS projects, there are additional regional and local efforts that can impact either the projected water supply availability or the demands on the RWS. Therefore, opportunities for collaboration in the San Joaquin Valley and local initiatives in San Francisco are described in this section. The comprehensive list of projects and opportunities included in this report is provided below in **Table 1**. The six regional AWS projects are shown geographically in **Figure 2**.

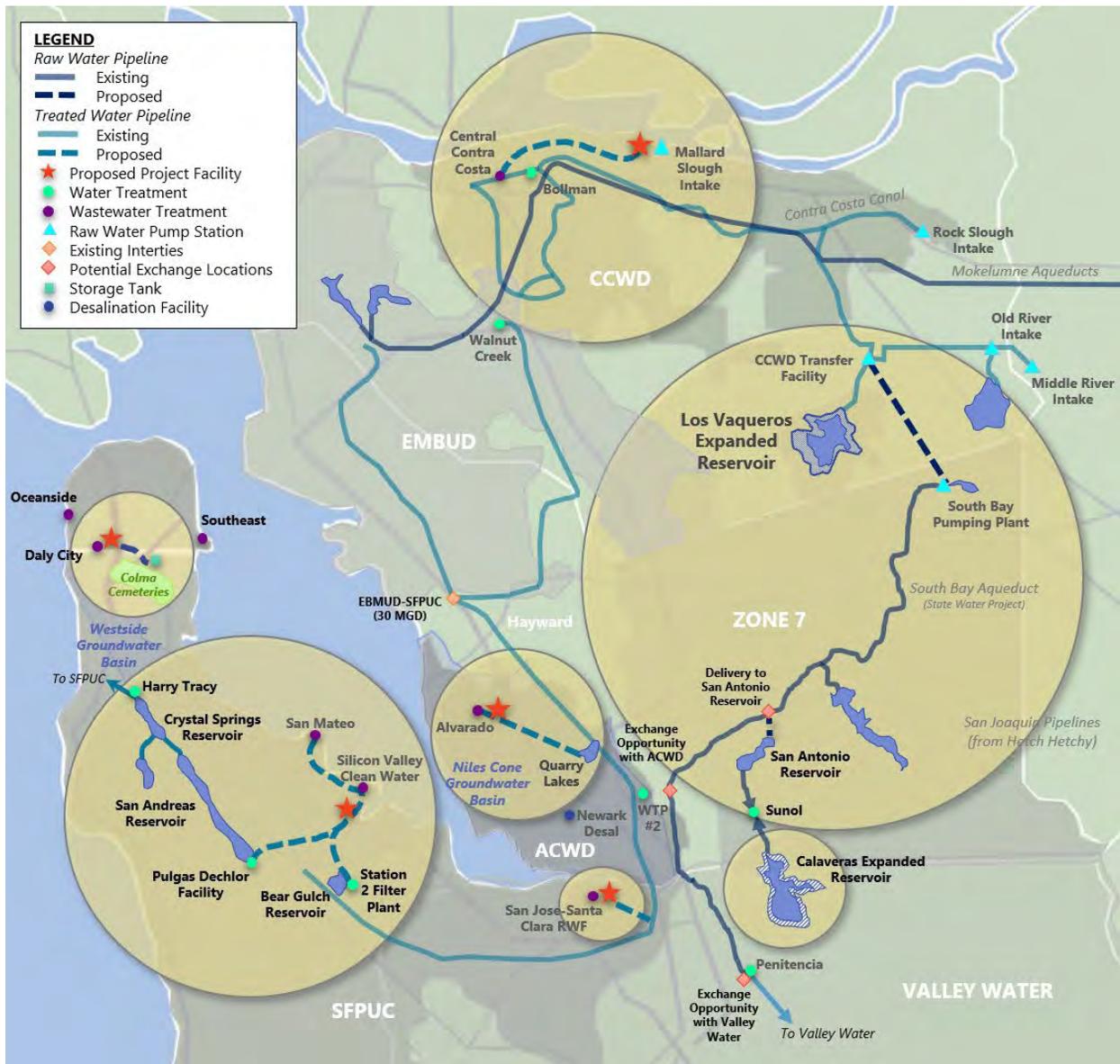
Table 1. List of Projects

Projects	Anticipated Volume of Water Supply (mgd)
Regional AWS Projects	
Daly City Recycled Water Expansion Project	0.7
Alameda County Water District (ACWD) – Union Sanitary District (USD) Purified Water Project	5.4
San Francisco Peninsula Regional PureWater Project	6
South Bay Purified Water Project	3.5
Los Vaqueros Reservoir Expansion Project	2
Calaveras Reservoir Expansion Project	20
San Joaquin Valley Projects	
Groundwater Banking	
Inter-Basin Collaborations	
Dry Year Transfers	
Local Projects	
PureWaterSF	
Innovations Program	
Stormwater Capture and Reuse	

Note: Anticipated volume of water supply from purified water projects is based on supply availability in a dry year.

Each project status discussion that follows in Sections 2.1, 2.2, and 2.3 includes the following subsections: *Project Background* and *Current Planning Considerations*, which is included for purposes and context, and *Activities This Quarter* and *Upcoming Activities* that are updated each quarter. **A schematic on *Project Partners & Interests* appears at the beginning of each of the regional projects in Section 2.1 in which there are multiple partners.**

Figure 2. Map of Regional AWS Program Activities



2.1 Regional Projects (ALL CURRENT AND UPCOMING ACTIVITIES UPDATED)

2.1.1 Daly City Recycled Water Expansion Project

Project Partners & Interests

SFPUC	Daly City (Sanitation District)	Cal Water
Increase drought supply reliability	Reduce ocean discharges	Develop local supplies

Project Background

This project supports the SFPUC's Groundwater Storage and Recovery Project (currently under construction) by making an additional 0.7 mgd of groundwater available in the South Westside Basin for drought supply. The project is envisioned to serve 7 cemeteries and other smaller irrigation customers with new recycled water supply, replacing existing groundwater pumping from the Basin. This will free up groundwater, enhancing the reliability of the Basin. The project has been a regional partnership between the SFPUC, Daly City, and the California Water Service Company (Cal Water), in coordination with the Town of Colma and the irrigation customers who are located largely within Cal Water's service area. As a private water utility, Cal Water's participation in the project is subject to approval by the California Public Utilities Commission. SFPUC customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts.

Current Planning Considerations

The current planning questions driving near-term project activities include:

- 1) How will the responsibilities and costs be allocated among the project partners?
- 2) How can project partners collaborate with potential customers to realize water supply benefits for all parties?

Activities this Quarter

This quarter, SFPUC staff met with the cemeteries individually to verify the estimated operational costs and water demands. The feedback from the cemeteries will help SFPUC staff and partners in developing the terms for interim agreements with the cemeteries on working together through the design phase of the project. SFPUC staff have also been in discussions with Cal Water on allocation of project water supply benefits and how to move forward with the partnership.

Upcoming Activities

In the coming quarter, the SFPUC will develop preliminary proposals on costs and other terms that would be included in terms for agreements with the cemeteries. Agreements with the

partners on cost-sharing and other terms will also be needed before the project can proceed with design.

2.1.2 ACWD-USD Purified Water Project

Project Partners & Interests

SFPUC	Alameda County Water District (ACWD)	Union Sanitary District (USD)
Increase Dry Year Supply	Reduce dependence on SFPUC Regional Water System	Reduce Bay discharges

Project Background

This project could provide a new purified water supply utilizing Union Sanitary District's treated wastewater. Purified water produced by advanced water treatment at Union Sanitary District could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District (ACWD)'s service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC could result in more water left in the Regional Water System. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC's Bay Division Pipelines.

Current Planning Considerations

The current planning questions driving near-term project activities include:

- 1) What is the maximum potential purified water that can be produced and put to beneficial use from this project?
- 2) What are the considerations and tradeoffs, such as costs and infrastructure needs, of the two selected alternatives that the partners wish to study?

Activities this Quarter

During this quarter, the project team continued to perform technical analyses on two alternatives for the feasibility study which include purified water concepts that could recharge the groundwater basin through Quarry Lakes as a first phase and provide water supply to ACWD or the SFPUC directly as a second phase. There are two variations of this phased concept based on whether or not planned capital improvements at the wastewater treatment facility are assumed.

Upcoming Activities

In the coming quarter, the consultant team will incorporate feedback from the partner agencies and complete a draft of the feasibility study.

2.1.3 San Francisco-Peninsula Regional PureWater Project (previously Crystal Springs Purified Water)

Project Partners & Interests

SFPUC	Silicon Valley Clean Water
	City of San Mateo
Increase dry-year supply or supply for San Jose / Santa Clara	Reduce Bay discharges
Cal Water	BAWSCA
	Redwood City
Develop local supplies	Mid-Peninsula Water District
	Increase dry-year supply

Project Background

The San Francisco-Peninsula Regional PureWater Project (SPRP) could generate up to 12 mgd of purified water and would likely be implemented in two phases. Treated wastewater from Silicon Valley Clean Water and/or the City of San Mateo would be conveyed to an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. In the first phase, the project would produce 6-8 mgd of purified water, which would be conveyed via pipelines to Crystal Springs Reservoir where it would be blended with regional surface water supplies and then treated again at Harry Tracy Water Treatment Plant. In the second phase of the project, 4-6 mgd of additional purified water would be treated at the advanced water treatment plant and added directly to the distribution systems in the region through treated water augmentation. Details of the second phase of the project will be developed further once regulations for direct potable reuse are finalized by December of 2023.

Current Planning Considerations

To evaluate the merits of the project to produce dry-year water supply, the SFPUC will need to answer the following near-term planning questions:

- 1) How will partners share in the cost and long-term benefits of the project?
- 2) How will a new water supply in Crystal Springs Reservoir affect water quality, operational needs, and distribution of RWS supplies?
- 3) Will a 12 mgd alternative that would directly connect to the RWS be feasible?

Activities This Quarter

This quarter, the project team for the Basis of Design Report (BODR) continued with the technical analyses of the project and is developing design criteria for conveyance and upgrades at the Pulgas Dechloramination facility. The draft technical memorandum on treatment has been distributed for review.

The SFPUC and the consultant team also kicked off the task order for evaluating a parallel project alternative that would bring 12 mgd of purified water directly, through treated water augmentation, to the RWS. The goal is to complete the feasibility analysis of this alternative at the same time as the Basis of Design Report so that a preferred project could be identified for CEQA review.

Upcoming Activities

The project team will prepare additional technical memoranda for the BODR as well as initiate the public engagement component of the scope of work. The SFPUC will also continue with the analysis of 12 mgd of direct potable reuse. Finally, the partners will further explore options for project governance.

2.1.4 South Bay Purified Water Project

Project Partners & Interests

SFPUC	City of San Jose
	City of Santa Clara
Increase dry-year supply	Develop local supplies, increase all-year and dry-year supplies

Project Background

SFPUC continues to plan to meet future demands and obligations with the intention to make the Cities of San Jose and Santa Clara permanent customers. Based on the request from San Jose and Santa Clara, permanent status requires SFPUC to provide at least 9 mgd of additional water supply guarantees to the two cities collectively.

Given the intent and interests described above, the SFPUC, San Jose, and Santa Clara launched a project partnership to explore and potentially implement a joint purified water project that would serve the local demands of San Jose and Santa Clara during all types of water years, while also supplementing the water supply provided through the SFPUC’s RWS in dry years. The feasibility of this concept, including the potential capacity and the sharing of supply, operation, and distribution is currently being evaluated in a feasibility study that will be completed this year.

Current Planning Considerations

An initial concept that is being explored is a 10-mgd advanced water treatment facility (i.e., purified water facility) that would use source water from the San Jose-Santa Clara Regional Wastewater Facility and operate at 6.5-mgd capacity during wet and normal years. During dry years, the facility would ramp up to the full 10-mgd capacity. The additional 3.5 mgd of purified water produced during dry years would be fed into the RWS to increase dry-year reliability. A feasibility study that will explore this initial concept in addition to an option that will maximize production capacity and various options for blending and distribution. Furthermore, the source

water flow and quality will be characterized based on actual dry-year data to provide a conservative approach and to ensure that the project would be able to operate during dry years.

To evaluate the merits of the project to produce dry-year water supply, the SFPUC will need to answer the following near-term planning questions:

- 1) Is there a technically viable project that can provide purified water for the Regional Water System customers as well as for local customers of San Jose and Santa Clara?
- 2) What are some viable planning scenarios for a mutually beneficial project?
- 3) Where should the new water supply tie into the RWS? How will this affect water quality, operational needs, and distribution of RWS supplies?

Activities This Quarter

The consultant team continued evaluating the feasibility of the 10-mgd facility and a 20-mgd alternative. A site layout and capital cost estimate for each facility size were developed. Sizing and siting of the storage and distribution components, including pipeline alignments, for each of the partners' systems were also evaluated. The SFPUC identified the need for storage upstream of the connection to the RWS (via the Bay Divisions Pipelines) to ensure sufficient operator response time in the unlikely case where the product water does not meet water quality specifications. The consultant team also estimated the electrical load of both facility sizes and how much of the load could be met with solar power.

In parallel with the technical work described above, the project partners executed a Memorandum of Agreement in January, which details the roles and responsibilities of the partners with respect to the Feasibility Study and the terms for sharing and payment of its costs. The cost of the Feasibility Study is being divided equally among the three partners.

Upcoming Activities

The consultant team will continue to develop and evaluate various project options as part of the Feasibility Study. The study is anticipated to be completed this year; key features will be included in the AWS Plan. Following completion of the Feasibility Study, the project partners will identify additional studies needed and the appropriate cost-sharing structure.

2.1.5 Los Vaqueros Reservoir Expansion Project (Storage)

Project Partners & Interests

CCWD	ACWD	SFPUC with BAWSCA
EBMUD	Zone 7 Water Agency Valley Water	
Increase water supply reliability	Increase water supply reliability	Increase Dry Year Supply or Supply for San Jose / Santa Clara
San Luis & Delta Mendota Water Authority	Grassland Water District	DWR (State)
		USBR (Federal)
Increase water supply for irrigation	Protect wildlife refuges	Provide approvals and funding

Project Background

The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority (JPA). The JPA was formed and filed with the State in October 2021 and the JPA Board of Directors' monthly meetings began in November 2021. The JPA will provide governance and administration for the project and the JPA members will assist in the design, construction, operation, and administration of the project.

CCWD is the lead agency on the planning, design and permitting efforts, with grant funds provided by the State and federal government, and contributions from partner agencies through Multi-Party Cost Share Agreement amendments.

The additional storage capacity from the LVE Project would provide a dry-year water supply benefit to the SFPUC. However, securing water supply to store in the LVE and ensuring that conveyance is available can both be significant barriers to realizing the full water supply potential of storage for SFPUC customers. In particular, issues related to water supply have been the focus for the SFPUC staff in determining the extent of participation in the LVE Project.

To better understand the water supply and conveyance options and the effects related to decision-making for the LVE Project, two subprojects were developed. The subprojects are listed below and described in Sections 2.1.5A and 2.1.5B:

1. **LVE Conveyance Alternatives** (evaluating conveyance from LVE to RWS facilities);
2. **LVE Supply Alternatives** (evaluating water supply options both in combination with or separate from storage in LVE). One of these options is using CCWD's existing point of diversion at Mallard Slough in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Delta) and treating the water through the **Bay Area Brackish Water Desalination Project**.

The treated water could serve as a source of supply that can be exchanged with CCWD for supply in LVE. This project is described in Section 2.1.5B below.

Current Planning Considerations

The current planning questions driving near-term project activities include:

- 1) What are the feasible water supply options available to fill storage in Los Vaqueros Reservoir for the SFPUC? What are the opportunities and constraints associated with each water supply?
- 2) What are the costs and constraints and institutional arrangements needed for taking water deliveries through the South Bay Aqueduct?
- 3) What are the operational constraints of LVE facilities to a) fill storage and b) take deliveries in dry years?
- 4) Are exchanges with partner agencies a feasible alternative to direct deliveries to the SFPUC? If so, under what conditions?

Several agreements must be executed among partner agencies to move the project forward and secure State funding for it. These include the following:

1. Service Agreement between the JPA and the parties and the following precursor agreements:
 - a. Facilities Usage Agreement between the JPA and CCWD and between the JPA and East Bay Municipal Utility District (EBMUD);
 - b. Design and Construction Agreement between the JPA and CCWD and between the JPA and EBMUD;
 - c. Administration and Technical Services Agreement between the JPA and CCWD; and
 - d. O&M Agreement between the JPA and CCWD.
2. Contract for the Administration of Public Benefits between the JPA and the Department of Water Resources (DWR) as well as JPA and Department of Fish and Wildlife.

Activities This Quarter

From executive participation at the JPA Board of Directors and in committees to staff engagement and participation in technical, financial, operational, and legal aspects of the project, the SFPUC continues to engage with the project partners to contribute to the development of this project. Developments in planning, permitting, design, and funding during this quarter are described below.

Planning, Permitting, and Design

Coordination continues on several permit applications that were previously submitted to the U.S. Fish and Wildlife Service, the California Department of Fish and Wildlife, Central Valley Regional Water Quality Control Board, and other regulatory agencies. Draft water rights change

petitions have been submitted to the State Water Resources Control Board for preliminary review.

The Los Vaqueros Dam design is nearly complete. A Basis of Design Report was submitted to the California Division of Safety of Dams in the last quarter. CCWD is now preparing an update to the Dam Expansion design submittals to address comments from the California Division of Safety of Dams and will request final approval of the permit to construct as part of the requirements of the California Water Commission Final Award Hearing.

A video inspection of the Los Vaqueros Dam Transfer Pipeline – the inlet/outlet pipeline for the dam – is complete. The final inspection report has been prepared and is anticipated in the next month. The report will be used to verify the pipeline condition and to develop any recommended improvements that may be needed that allow the pipeline to withstand the higher pressure resulting from the increased water level in the expanded reservoir.

The 90% design of the Transfer-Bethany Pipeline Turn-In to the California Aqueduct is under review by DWR in coordination with CCWD. The terms of a Turn-In Agreement between the JPA and DWR, which will define roles and responsibilities for design, construction and long-term operation, maintenance, and ownership of facilities within the DWR right-of-way are under development by CCWD. The draft terms will be reviewed with the JPA prior to submittal to DWR. SFPUC staff continue to participate in the monthly Los Vaqueros Design Review team meetings alongside other JPA Members.

State and Federal Funding

Federal funding for the project is expected to provide 25% of the total project cost or approximately \$160 million, of which \$14 million was appropriated in Fiscal Year 2021 and \$50 million in Fiscal Year 2022. The project has been approved for \$477 million from California Proposition 1 funds. The remainder of project costs will be covered by contributions from the JPA Members.

WIFIA Funding

In this quarter, the U.S. Environmental Protection Agency (USEPA) invited the Los Vaqueros Reservoir JPA to apply for a low-interest, federal WIFIA loan of up to \$675 million. The invitation to apply started the second phase of the WIFIA borrowing process. The JPA Board of directors authorized the JPA Executive Director to pursue indicative credit rating for the JPA with Standard & Poor in preparation for submitting a loan application. With a successful application, the JPA expects to secure the necessary funding to complete design and construction. The project team expects to submit the loan application by mid-2023.

Partners

The partner agencies have been contributing funds to the LVE project since 2017 through a series of local cost share agreements between CCWD and other JPA Members. The Multiparty Cost Share Agreement was executed in 2019 and has been amended multiple times. Funds from Amendment No. 3 to the Multiparty Cost Share Agreement continue to support the project activities in this quarter. The term of Amendment No. 3 covers local funding for expenses incurred through December 31, 2022.

Amendment No. 4 to the Multi-party Cost Share Agreement was fully executed in this quarter. The cost-share for each JPA Member agency, excluding Grassland Water District, is \$1,094,000. Amendment No. 4 extends the agreement term through June 30, 2023 and provides a sum of \$7.6 million for continued planning and development of the project. Depending on the timing of the service agreements, additional funding may be needed and options are being considered by the JPA Board.

JPA Budget

The JPA Members collectively contributed \$10.8 million during Fiscal Year 2023. Fiscal Year 2024 budget is currently under development and will be brought to the JPA Board in May 2023.

Los Vaqueros Reservoir Expansion Joint Powers Authority (JPA)

The JPA Board continues to meet monthly. During this quarter the JPA Board of Directors re-elected officers of the Board, adopted conflict of interest code and voted on weighed on bridge funding strategies among other issues. The agenda and supporting information for the JPA Board Meetings are available on the JPA website: <http://www.losvaquerosjpa.com>.

CCWD continues to provide technical support to the project and has secured a consulting contract for providing Capital Project Management services to support the JPA and CCWD in providing cost and schedule controls, risk reviews, technical reviews and cost and progress reporting, among other project management activities.

Upcoming Activities

Activities expected to take place in the next quarter are as follows:

- Construction cost update for the project including dam expansion and the Transfer-Bethany Pipeline
- Technical analysis and negotiation among the JPA members to secure capacity usage rights and draft a facility usage Agreement
- Drafting of the Contract for Administration of Public Benefits, a requirement for obtaining CWC Funding
- Efforts in preparation of the WIFIA application for the USEPA

- Initiation of WIFIA cost-benefit analysis with the assistance of the LVE financial consultant, in collaboration with CCWD's engineering team and the LVE Financial Work Group
- Development of methodology for grant funding allocation and the financial impact on the partner agencies
- Continuation of work on the identification and preliminary characterization of water supply options for SFPUC

2.1.5.A LVE Conveyance Alternatives

Project Background

The SFPUC is considering the Los Vaqueros Reservoir as a dry-year supply. Two main pathways involve moving water from storage in a prospective LVE Project to the SFPUC's service area, either directly to RWS facilities or indirectly via an exchange with partner agencies. The first and preferred path is through the South Bay Aqueduct (SBA), and the second pathway is through East Bay Municipal Utility District (EBMUD).

The SBA is a 49-mile aqueduct, which is part of the State Water Project, owned by the California Department of Water Resources (DWR). Three State Water Project contractors (SBA Contractors) maintain contract capacity for use of the SBA: Zone 7 Water Agency, ACWD, and Valley Water. The SBA is in close geographical proximity to SFPUC's San Antonio Reservoir and the Sunol Valley Water Treatment Plant. SFPUC staff, in coordination with BAWSCA, have been working with the SBA Contractors to develop a clear understanding of what the maximum potential use of the SBA could be that would be of benefit to the SFPUC and what constraints may exist to achieving those benefits.

Current Planning Considerations

As indicated under the LVE Project, identifying a viable conveyance pathway is critical for the SFPUC's participation. The primary focus of this task has been to understand the capacity within the SBA and evaluate an alternative through EBMUD.

Activities this Quarter

The SFPUC and DWR continued discussions on technical and financial terms and conditions of a conveyance agreement for the Los Vaqueros supplies. In addition, DWR has indicated that a turnout agreement is needed for the SFPUC to take delivery of water off the SBA. Typically, the Turnout Agreement is drafted when an agency submits 30-60% Design Plans and Specifications for DWR's review. However, in this case, since the turnout is already built, staff will work with DWR on how to submit a turnout proposal and obtain updated information on the characteristics of the existing structure, such as maximum allowable flow for receiving water from the Los Vaqueros Reservoir.

Three of the alternatives involve exchanges with the SBA Contractors and one involves wheeling through an agreement with DWR under the California Water Code 1810. DWR, as the

owner, would have discretion in deciding when unused capacity is available. More information on the source of water is needed prior to entering into a conveyance agreement with DWR.

In addition to direct deliveries to the SFPUC facilities, SFPUC staff are also pursuing exchanges with SBA Contractors. ACWD is a State Water Project SBA Contractor as well as SFPUC's Wholesale Customer. Also, the SFPUC and the Santa Clara Valley Water District (Valley Water), another State Water Project SBA Contractor have common customers including Cities of San Jose and Santa Clara. Discussions have been ongoing through this quarter with both agencies regarding potential exchanges. The potential for an exchange with ACWD is being evaluated through the BARR SWAP project described below.

Upcoming Activities

In the coming quarter, staff will continue to engage with ACWD and Valley Water to understand the constraints and condition of exchanges. Changes in the LVE storage allocation may result in changes to previously modeled SBA spare capacity. Additional analysis maybe needed to evaluate the impact of these changes on SFPUC's ability to receive deliveries through the SBA.

2.1.5.B LVE Supply Alternatives (UPDATED)

Project Partners & Interests

CCWD	Zone 7 Water Agency
EBMUD	SFPUC
EBMUD	Valley Water
Facilitate regional water supply reliability	Increase water supply reliability

Project Background

In conjunction with the LVE Project, the SFPUC is evaluating water supply alternatives that can provide a long-term reliable source to be stored in the expanded Los Vaqueros Reservoir. The SFPUC is evaluating two main categories of supplies: 1) transfers and 2) new water supplies generated by advanced treatment of wastewater, brackish water, or groundwater. This supply would provide 4 to 5 mgd of storage in normal and dry years. One alternative that has been studied extensively is the Bay Area Brackish Water Desalination (Regional Desalination) Project, which is a partnership between CCWD, SFPUC, the Santa Clara Valley Water District, and Alameda County Flood Control and Water Conservation District, and Zone 7 Water Agency. EBMUD may also be involved.

The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. The project relies primarily on available capacity in an extensive network of existing pipelines and interties that already connect the agencies, as well as existing wastewater outfalls and pump stations. The SFPUC would not directly receive desalinated water but would take delivery of water through a series of exchanges through LVE.

Current Planning Considerations

The SFPUC is considering potential water supply sources for storage in LVE. For considering the options, the current planning questions include:

- 1) What are the conditions needed to make an exchange of water to fill SFPUC storage in LVE in wet years possible?
- 2) What are the losses associated with an exchange and related conveyance?
- 3) What are the alternatives to desalination for water supply storage in LVE?

Activities this Quarter

The SFPUC has initiated a Water Supply Analysis evaluating this project along with other water supply alternatives that can be stored in an expanded Los Vaqueros Reservoir. Following the initial screening of technically feasible “new” water source alternatives, in the last quarter, the second phase of the Water Supply Feasibility Analysis continued in this quarter. The objective of this phase is to develop an understanding of the water transfers and the water that can be stored in the expanded Los Vaqueros reservoir and used as a short-term strategy while a long-term “new” water supply is under development.

In collaboration with CCWD, staff will continue outreach efforts to coordination with potential regional and other partners to verify information and confirm interest and operational constraints.

Upcoming Activities

Additional analysis of feasible long-term supply alternatives will be initiated in the next quarter. Initial consideration of transfer water as a short-term strategy for storage in the expanded Los Vaqueros Reservoir will also continue.

2.1.6 Calaveras Reservoir Expansion Project

Project Background

This storage project envisions the expansion of Calaveras Reservoir to store excess RWS supplies or other source water in wet/normal years. No expansion of water rights from the local watershed is anticipated. With the Calaveras Dam Replacement project in place, Calaveras Dam impounds a capacity of 96,850 acre-feet or 31 billion gallons of water. Through an expansion, up to an additional 289,000 acre-feet or 94 billion gallons of additional storage could be realized. Calaveras Reservoir is owned and operated by the SFPUC for the benefit of RWS customers. Unlike all other regional projects under review in this program, no external partners are anticipated at this time.

Current Planning Considerations

The current planning questions include:

- 1) What are the conveyance alternatives, including infrastructure and operational considerations, for an expanded Calaveras Reservoir?
- 2) How can different water supply alternatives be integrated to maximize efficient use of expanded storage at Calaveras?

Activities this Quarter

During this quarter, the project team conducted an additional internal briefing to present changes made to the draft Calaveras Conveyance Feasibility Study. Staff continued the preparation of a Request for Proposal (RFP) for the Water Enterprise Capital Improvement Program to support the future phase(s) of this project.

Upcoming Activities

In the next quarter, the project team will prepare the draft final Feasibility Study. The RFP will continue to be developed.

2.2 San Joaquin Valley Projects

2.2.1 Groundwater Banking

Project Background

Groundwater banking in the Modesto Irrigation District and Turlock Irrigation District service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

Activities this Quarter

There is no change in status for this project over the reporting period.

Upcoming Activities

Feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

2.2.2 Inter-Basin Collaborations

Project Background

Inter-Basin Collaborations could include establishing a partnership between interests on the Tuolumne River 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, and this excess flow could 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.

Activities this Quarter

No new development has occurred during this reporting period.

Upcoming Activities

As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

2.2.3 Dry Year Transfers

Project Background

During the planning and implementation of the Phased Water System Improvement Program, the SFPUC pursued a long-term agreement to transfer 2 mgd from MID in dry years only. The negotiations were terminated in 2012. Subsequently, the SFPUC has initiated discussions with Oakdale Irrigation District to secure a similar dry year transfer.

Activities this Quarter

No new water transfer developments occurred during this reporting period.

Upcoming Activities

While no transfer has been secured to date, the SFPUC continues to engage in discussions with partners to explore potential transfer opportunities on the Tuolumne River and throughout the San Joaquin Valley.

2.3 Local Projects

(ALL CURRENT AND UPCOMING ACTIVITIES UPDATED)

This section describes new alternative water supply projects in SFPUC's retail service area that can offset future retail purchases from the RWS. This list supplements the SFPUC's robust efforts in conservation, water recycling, onsite water reuse, and local and regional groundwater that have been underway for decades. The SFPUC has implemented conservation programs to minimize both indoor and outdoor retail water demands, resulting in a per capita residential water consumption rate of 42 gallons per person per day, a rate that is half the statewide average.

2.3.1 PureWaterSF (San Francisco Purified Water)

Project Background

PureWaterSF is a project that envisions providing a new, local drinking water supply in San Francisco of 4 mgd by treating recycled water from the Oceanside and Southeast Treatment Plants. In 2020, the SFPUC successfully completed a small-scale research and demonstration purified water project at its headquarters. With the absence of large remaining non-potable applications in San Francisco, the SFPUC has evaluated the maximum potential for recycling water for drinking or producing purified water that can be blended in San Francisco's drinking water reservoirs consistent with draft regulations that are being developed by the State Water Resources Control Board.

The proposed project would also provide supply of 1.2 mgd to meet the non-potable demands of dual-plumbed⁷ buildings in San Francisco that do not currently have a non-potable water supply source (previously reported as the Satellite Recycled Water Project). The supply would serve irrigation and toilet and urinal flushing needs, as well as commercial and industrial uses not addressed by the Non-Potable Ordinance.

Activities this Quarter

This quarter, the SFPUC continued fleshing out key project needs and developing an outreach and public engagement plan. SFPUC staff also discussed experiences with other utilities that have begun planning purified water projects.

Upcoming Activities

The SFPUC is moving forward with project planning.

2.3.2 Innovations Program

Project Background

This program supports development of new technologies and initiatives to demonstrate the feasibility of atmospheric water generation technology, heat recovery in non-potable systems, expanded leak detection, and breweries treating process water for reuse. Included in the Innovations Program are demonstration of new technologies and grant funds to support partnership opportunities. Examples of projects within the Innovations Program include a grant program to treat process water in breweries and grants to support onsite reuse projects with heat recovery systems. San Francisco's Onsite Water Reuse Program allows for the collection, treatment, and use of alternate water sources for non-potable applications in individual buildings and at the district-scale. The onsite water reuse systems under the Non-Potable Ordinance apply to new, large development projects in San Francisco. The SFPUC is also

⁷ Dual-plumbing is a plumbing system with two sets of pipes. One set of pipes is designed and used for the transmission of recycled water within buildings and structures, including lateral supply pipelines, and which is separate from the existing set of pipes or any potable water distribution system that complies with all material and construction specifications contained in City codes and other applicable State and Federal laws. There are several dual-plumbed buildings in San Francisco that installed the plumbing to comply with the Recycled Water Ordinance.

pursuing a prospective project to expand leak detection and a project to test atmospheric water generation technology.

Activities this Quarter

The SFPUC continued to monitor the performance of the atmospheric water generation panels and the ongoing operations of the brewery process water reuse system installed at Anchor Brewing Company.

The SFPUC continues to use several technologies and approaches to detect potential leaks in its system. This includes an ongoing pilot of the Echologics acoustic leak detection platform.

Upcoming Activities

The SFPUC will continue developing projects to demonstrate the potential for water savings and supply with innovations in the coming quarter.

2.3.3 Stormwater Capture and Reuse (NEW)

Project Background

The SFPUC's efforts on capturing stormwater in San Francisco focus on collection of stormwater and harvesting of rainwater for reuse. The efforts range from capital investments in green infrastructure projects to city-wide mandates for new construction to manage stormwater runoff. The SFPUC also incentivizes collection and reuse of rainwater through rebates and encourages stormwater management through grant programs.

Under the Vista Grande Drainage Basin Improvement Project, the SFPUC is coordinating with the City of Daly City to divert stormwater from the Vista Grande Watershed to South Lake Merced. The project is aimed toward better management of stormwater transport to the Pacific Ocean to increase lake levels, improve stormwater quality, and help restore the Lake Merced Drainage Basin's natural hydrology.

The SFPUC also administers the Non-Potable Ordinance that requires onsite water reuse systems for new development projects of 100,000 gross square feet or greater in San Francisco and the Stormwater Management Ordinance that outlines the mandatory requirements for managing post-construction stormwater runoff and provides guidance on how to incorporate green infrastructure into site design. Some of the grant programs include the Green Infrastructure Grant Program, Floodwater Management Grant Assistance Program, Urban Watershed Stewardship Grants, and Onsite Water Reuse Grant Program.

Activities this Quarter

The SFPUC continues to explore opportunities to capture and reuse stormwater by developing and advancing projects, partnering with other agencies, and administering incentive programs for its customers.

Since the launch of the Green Infrastructure Grant Program in February 2019, the SFPUC has awarded a total of \$17.8 million in grants to 17 projects. When completed, the projects are designed to capture and divert about 11 million gallons of stormwater per year. On Feb. 7, 2023, the SFPUC announced new investments totaling \$7.25 million for stormwater management projects as part of the Green Infrastructure Grant Program. The investments in this grant cycle are the largest since the program's inception in 2019. The program funds six projects to transform local outdoor spaces, reduce flood risk, improve urban habitat, increase climate resilience, and improve coastal water quality. Recipients include: four schools from San Francisco Unified School District (\$6.4 million awards), University of California, Parnassus (\$1.7 million award), and Project Artaud (\$684,000 award), a member-run nonprofit artist collective in the Mission District.

Upcoming Activities

The SFPUC will continue to develop initiatives and projects to capture stormwater and harvest rainwater for reuse.

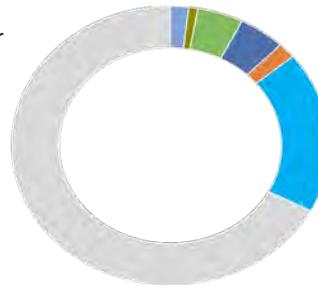
2.4 Project Summaries

In the following pages, single page summaries of each project are provided, along with current planning and development schedules and additional details of each project included in this program.

Summary of Alternative Water Supply Program

Project Description

As the SFPUC plans to 1) meet environmental flow obligations requirements and projected customer obligations demands for existing customers; 2) evaluate serving new permanent customers and providing additional supply for existing customers; and 3) prepare for future climate effects and other uncertainties through the 2045 water supply planning horizon, there is a need to look beyond current surface water supplies and operations of the San Francisco Regional Water System (RWS) and local groundwater sources. The Alternative Water Supply (AWS) Program was established to evaluate new and diverse “alternative” water supply options such as expanding storage, groundwater banking, transfers, purified water (potable reuse), desalination, and technological innovations that can increase supply.



- Dry Year Transfers (Districts) – 2 mgd
- Daly City Recycled Water Expansion – 1 mgd
- ACWD-USD Purified Water – 5 mgd
- Crystal Springs Purified Water – 5 mgd
- Los Vaqueros Reservoir Expansion
- Bay Area Brackish Desalination – 2 mgd
(supply for storage in Los Vaqueros)
- Calaveras Reservoir Expansion – 20 mgd

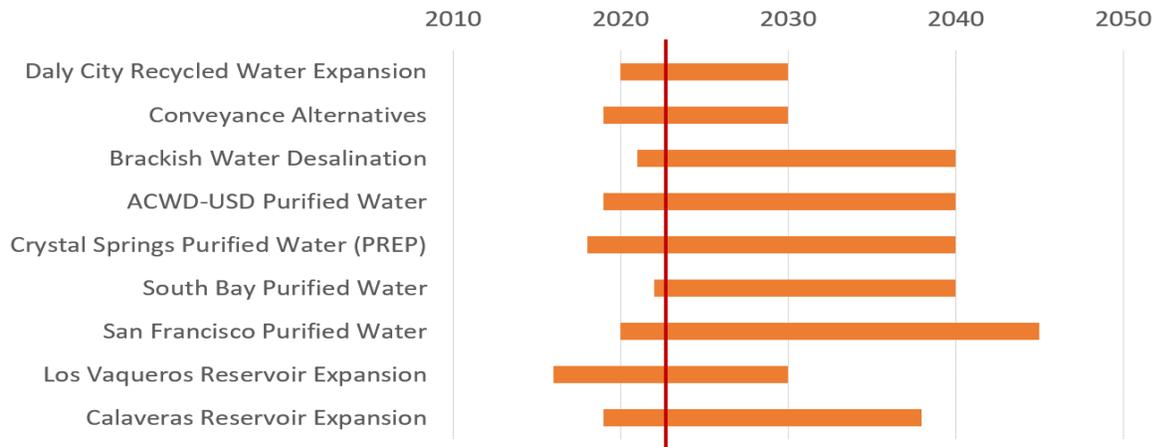
Potential New Alternative Water Supply Options

While the AWS projects support the SFPUC’s goal of balancing meeting future water needs, they are not all necessarily centered around the surface water supply source. The projects that can provide direct water supply benefits and are currently being evaluated include four regional water supply projects, two regional storage expansion projects, and two local water supply projects in San Francisco.

General Program Information				10-Yr CIP Budget Allocation		Current FY23 Allocation	
Average Annual Supply		Availability		Regional		Local	
Potential to improve supply reliability		Varies		\$131.5M		\$48M	
				\$13.8M		\$6.3M	
Total Project Costs				Capital Cost/Acre-Foot			
Est. Capital Cost:	TBD	Est. Annual O&M:	TBD	TBD			

Programmatic Schedule

Proposed Schedule of Projects



Current Status	Risks and Uncertainties	Benefits
Planning 18-Month Outlook • Feasibility studies underway to identify and analyze project concepts	• Determining incremental water supply benefits • Integrating new supplies with existing supplies	• Potential to improve water supply reliability

Daly City Recycled Water Expansion

Project Description

This project can make an additional 0.7 mgd available in the South Westside Basin for drought supply. The project is envisioned to serve 13 cemeteries and other smaller irrigation customers with an average annual recycled water supply of 1.25 mgd, offsetting existing groundwater pumping from the South Westside Basin. This will free up groundwater, enhancing the reliability of the Basin. The project has been a regional partnership between the SFPUC, Daly City, and the California Water Service Company (Cal Water), in coordination with the Town of Colma and the irrigation customers who are located largely within Cal Water’s service area. As a private water utility, Cal Water’s participation in the project is subject to approval by the California Public Utilities Commission (CPUC). SFPUC customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts. In this way, this project supports the Groundwater Storage and Recovery (GSR) Project, which is under construction.



Holy Cross Cemetery Colma, CA

Project Partners

Daly City, Town of Colma, Cal Water and SFPUC

SFPUC Project Manager

YinLan Zhang

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
0.7 MGD	Drought and All Years	Recycled Water / Groundwater Offset	Regional	TBD

Total Project Cost

Est. Capital Cost:	\$85.0M	Est. Annual O&M:	\$2.0M
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SFPUC Budget Information

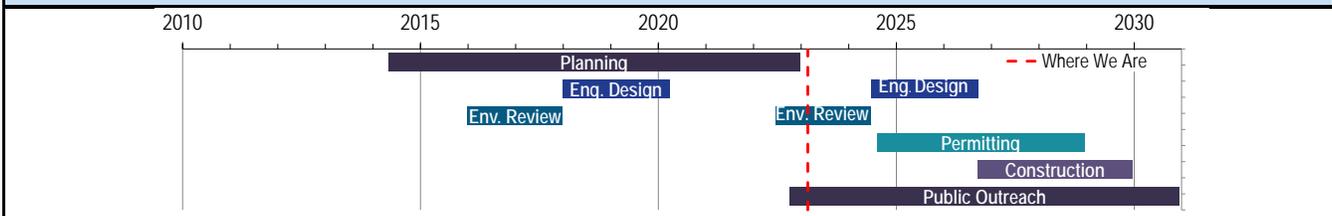
10-Yr CIP Budget Allocation:	\$16.2M	Current Allocation:	\$10.0M
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Institutional Complexity

SFPUC Only Multi-Party Partnership

Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Planning</p> <p>18-Month Outlook</p> <ul style="list-style-type: none"> Identify Project ownership and cost structure among Partners (SFPUC, Daly City, Cal Water) Develop Term Sheet for project Outreach and communication with cemeteries and Colma 	<ul style="list-style-type: none"> Securing customers (cemeteries and others) Partner buy-in and involvement Finalizing and procuring storage tank location Realizing groundwater offset benefits through GSR Loss of 1-2 SFPUC retail customers, dependent on negotiations with partners 	<ul style="list-style-type: none"> Reducing reliance of cemeteries on groundwater pumping for irrigation will increase the reliability of the Southwest Groundwater Basin for drinking water supply Recycled water supply may be available for additional customers (to be identified) Diversifying water supply portfolio Replace some potable water used for irrigation with recycled water (0.05 mgd)

SFPUC-Alameda County Water District - Union Sanitary District Purified Water Partnership

Project Description

This project will provide a new purified water supply utilizing Union Sanitary District (USD)'s treated wastewater and further treating it through a multi-barrier advanced treatment process to meet or exceed drinking water standards. While the potential volume of supply will be determined through a feasibility evaluation, prior studies indicate the potential for at least 4 mgd of new supply. Purified water produced at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or for other uses in Alameda County Water District's (ACWD's) service area. With the additional water supply to ACWD, an in lieu exchange with the SFPUC would result in more water left in the SFPUC's Regional Water System. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and SFPUC. A range of scenarios considering treatment capacity, distribution potential and feasibility are being considered through an evaluation between the three partner agencies.



Quarry Lakes, Alameda County

Project Partners

Union Sanitary District (USD), Alameda County Water District (ACWD) and SFPUC

SFPUC Project Manager

YinLan Zhang

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
TBD	All Years	Purified Water	Regional	TBD

Total Project Cost

Est. Capital Cost:	TBD	Est. Annual O&M:	TBD
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SFPUC Budget Information

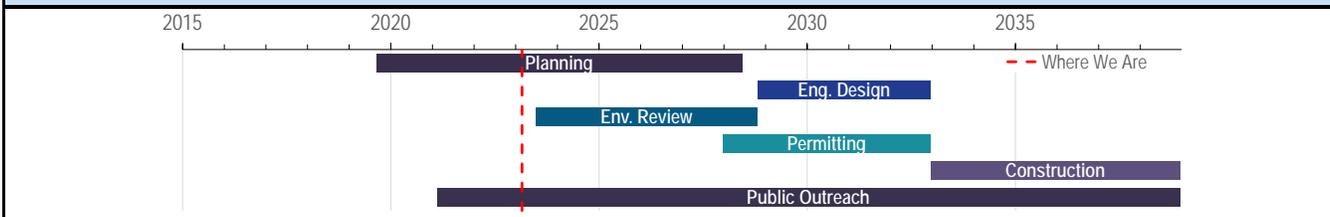
10-Yr CIP Budget Allocation:	\$9.4M	Current Allocation:	\$2.4M
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Institutional Complexity

SFPUC Only Multi-Party Partnership

Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Planning</p> <p>18-Month Outlook</p> <ul style="list-style-type: none"> Develop and analyze the two selected alternatives 	<ul style="list-style-type: none"> Uncertainty of planned capital improvements at wastewater treatment plant may affect purified water treatment requirements Potential water quality change to Quarry Lakes 	<ul style="list-style-type: none"> Leverages existing facilities to provide water supply

San Francisco-Peninsula Regional PureWater

Project Description

San Francisco-Peninsula Regional PureWater Project could provide 6-12 mgd of water supply through a combination of reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS, and direct potable water reuse through raw water augmentation or treated water augmentation to partner agencies. Treated wastewater from Silicon Valley Clean Water and/or the City of San Mateo would be conveyed to an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be delivered via pipelines to Crystal Springs Reservoir and directly to water purveyors on the Peninsula. Purified water that goes to Crystal Springs Reservoir would be blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Purified water that does not go to Crystal Springs would be added directly to the supply of water retailers on the Peninsula. In addition to the SFPUC and the wastewater agencies, Cal Water, Redwood City, Mid-Peninsula Water District and BAWSCA are also participating in the project. Initial feasibility analyses have been completed. Additional planning and preliminary design, including analysis of feasible operational scenarios, impacts to RWS operations, the evaluation of Direct Potable Reuse (DPR) alternatives, as well as treatment train options, are needed to further develop the project and evaluate its impacts.



Crystal Springs Reservoir

Project Partners

Silicon Valley Clean Water, City of San Mateo, Cal Water, Redwood City, Mid-Peninsula Water District, Bay Area Water Supply and Conservation Agency (BAWSCA) and SFPUC

SFPUC Project Manager

YinLan Zhang

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
TBD	All Years	Purified Water	Regional	TBD

Total Project Cost

Est. Capital Cost:	TBD	Est. Annual O&M:	TBD
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SFPUC Budget Information

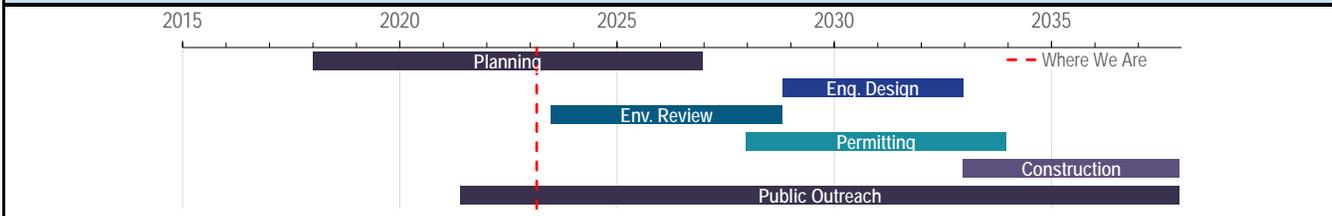
10-Yr CIP Budget Allocation:	\$15.8M	Current Allocation:	\$6.8M
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Institutional Complexity

SFPUC Only Multi-Party Partnership

Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Planning</p> <p>18-Month Outlook</p> <ul style="list-style-type: none"> Continue analysis of impacts of new water supply into Crystal Springs Reservoir Feasibility study of 12 mgd DPR into RWS Collaborate with partners on Basis of Design Report 	<ul style="list-style-type: none"> Operational and water quality challenges in Crystal Springs Reservoir Construction challenges in parts of distribution area Water supply during non-drought years would impact operations and storage availability in the Regional Water System 	<ul style="list-style-type: none"> Reduces Bay discharges Provides a new drought-resistant water supply

South Bay Purified Water

Project Description

This is a joint purified water project between the SFPUC, City of San Jose, and City of Santa Clara that could provide all-year supply to the cities of San Jose and Santa Clara and dry-year supply to the Regional Water System (RWS). Project sizes are still being evaluated, but an initial concept that is being explored is a 10-mgd advanced water treatment facility (i.e., purified water facility) that would use source water from the San Jose-Santa Clara Regional Wastewater Facility and operate at 6.5-mgd capacity during wet and normal years. During dry years, the facility would ramp up to the full 10-mgd capacity. The additional 3.5 mgd of purified water produced during dry years would be fed into the RWS to increase dry year reliability.



San Jose-Santa Clara Regional Wastewater Facility

Project Partners

City of San Jose, City of Santa Clara, and SFPUC

SFPUC Project Manager

Fan Lau

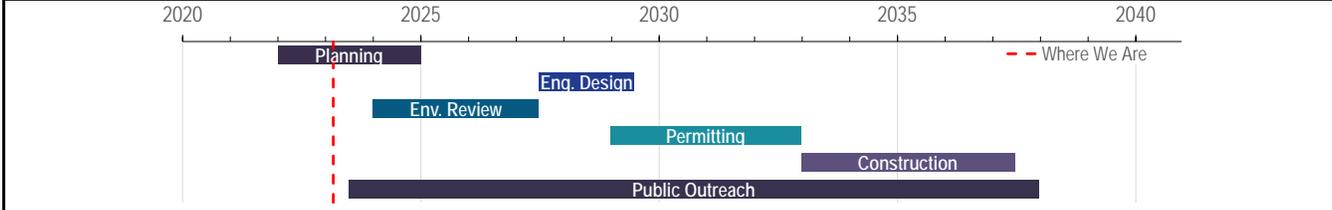
General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
3.5 mgd	Drought and All Years	Purified Water	Regional	TBD

Total Project Cost **Institutional Complexity**

Est. Capital Cost:	TBD	Est. Annual O&M:	TBD	SFPUC Only Multi-Party Partnership <small>Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.</small>
SFPUC Budget Information				
10-Yr CIP Budget Allocation:	\$0.0M	Current Allocation:	\$0.0M	

Estimated Project Schedule (Not a Baseline Schedule)



Current Status **Risks and Uncertainties** **Benefits**

Conceptual; Planning 18-Month Outlook <ul style="list-style-type: none"> Complete Feasibility Study Conduct additional technical, operational and water quality studies 	<ul style="list-style-type: none"> Operational and water quality challenges in RWS transmission system Public acceptance of non-traditional water supply NPDES compliance related to discharge to receiving waters Environmental impacts to receiving waters Impacts of enhanced source water control 	<ul style="list-style-type: none"> Provides a new drought-resistant supply to San Jose and Santa Clara Provides a water supply option to support San Jose's and Santa Clara's request for permanent status Provides a dry-year supply to the Regional Water System
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Los Vaqueros Reservoir Expansion

Project Description

The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. The main objectives of the expansion include increasing water supply reliability for municipal, industrial and agricultural customers as well as ecosystem benefits to south-of-Delta wildlife refuges and Delta fisheries. While the existing reservoir is owned and operated by Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority that was formed in October 2021. Meanwhile, Contra Costa Water District is leading the planning, design and environmental review efforts. The LVE Project includes construction of new pipelines, upgrades to existing facilities and reoperation of some facilities. Storage in LVE can provide a dry year water supply benefit to the SFPUC's Regional Water System (RWS). Currently, SFPUC staff are pursuing scenarios of 20,000 - 40,000 acre-feet of storage. In addition, water supply and conveyance to the RWS need to be determined before the SFPUC determines the extent of participation in the LVE project. Conveyance Alternatives, Brackish Water Desalination, and BARR simulation are planning efforts that are linked directly to this project.



Los Vaqueros Reservoir

Project Partners

Alameda County Water District (ACWD), CCWD, East Bay Municipal Utility District (EBMUD), SFPUC, Zone 7 Water Agency, and the San Luis Delta Mendota Water Authority

SFPUC Project Manager

Senobar Lanigan

General Project Information

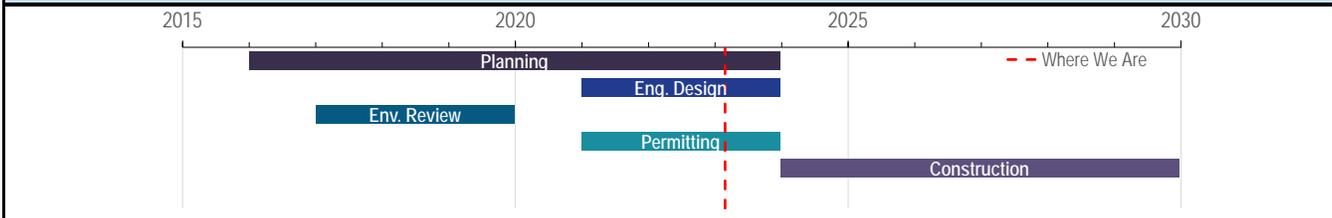
Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
To be identified in a separate project	Drought and/or All Years	Storage	Regional	TBD

Total Project Cost				Institutional Complexity	
Est. Capital Cost:	\$110M	Est. Annual O&M:	TBD	SFPUC Only	Multi-Party Partnership
<small>Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.</small>					

SFPUC Budget Information

10-Yr CIP Budget Allocation:	\$30.7M	Current Allocation:	\$12.0M
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Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
Planning; Environmental Review; Permitting 18-Month Outlook <ul style="list-style-type: none"> Project cost allocations Operational Details Service Agreements Initial Feasibility of water supply options Staff recommendations on conveyance and storage JPA Monthly Meetings Submit EPA Loan Application for \$675M 	<ul style="list-style-type: none"> Capacity and institutional constraints for conveyance to RWS Firm source of water supply Water quality risks and treatment needs, depending upon conveyance pathway 	<ul style="list-style-type: none"> Provides operational flexibility, particularly in drier years Allows the SFPUC to manage existing supply more efficiently

LVE Conveyance Alternatives

Project Description

This project is dependent on the SFPUC's participation in the Los Vaqueros Expansion Project in Contra Costa County. Through this evaluation, SFPUC staff will evaluate the potential mechanism(s) available to transfer or exchange water for the benefit of SFPUC Regional Water System (RWS) customers. The volume of water that can be transferred would be the same volume of water that is stored by SFPUC in Los Vaqueros Reservoir Expansion Project (to be determined).



South Bay Aqueduct

The three conveyance alternatives that will be explored as part of this project using the South Bay Aqueduct (SBA) include 1) a transfer with ACWD; 2) a transfer with Valley Water; and 3) delivery to San Antonio Reservoir. Partners will include the SBA Contractors (ACWD, Zone 7 Water Agency, Valley Water), particularly any agency identified as a feasible transfer partner. Of the three options along the SBA, only one (delivery to San Antonio) provides a water supply directly into the RWS. Any conveyance option utilizing the SBA will likely include pipeline improvements and may also include pretreatment and/or pumping, depending on the option pursued. Reliability of the SBA is critical to the viability of these options.

In addition to the SBA, SFPUC is also considering other alternatives, including the potential for a new intertie with the East Bay Municipal Utility District (EBMUD).

Project Partners

SFPUC and BAWSCA working with SBA Contractors: Alameda County Water District (ACWD), Zone 7 Water Agency, and Valley Water

SFPUC Project Manager

Senobar Lanigan

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
Dependent on water supply	All Years	Transfer	Regional	TBD

Total Project Cost

Est. Capital Cost:	TBD	Est. Annual O&M:	TBD
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Institutional Complexity

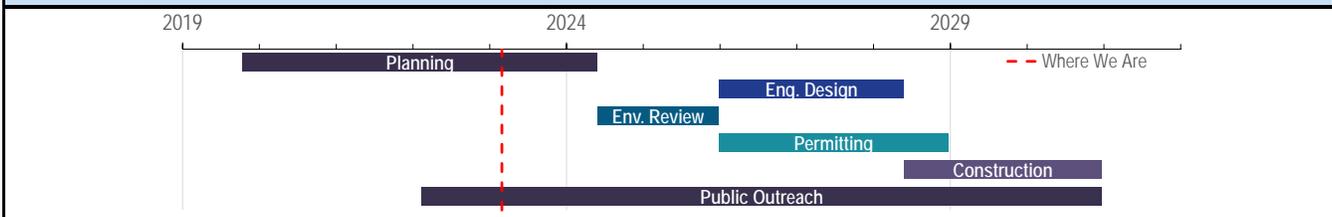
SFPUC Only Multi-Party Partnership

Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.

SFPUC Budget Information

10-Yr CIP Budget Allocation:	\$5.8M	Current Allocation:	\$2.0M
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Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Planning</p> <p>18-Month Outlook</p> <ul style="list-style-type: none"> Identify preferred conveyance and delivery alternative and plan next steps Continue engagement with the Department of Water Resources on conveyance agreement 	<ul style="list-style-type: none"> Institutional arrangements / willingness of stakeholders Treatment and pre-treatment in some cases WQ challenges associated with new source of supply 	<ul style="list-style-type: none"> Leverages existing infrastructure For exchanges (with ACWD and VW) treatment will be delegated to a partner familiar with SBA as a source

LVE Supply Alternatives (Bay Area Brackish Water Desalination Project)

Project Description

In conjunction with the LVE Project, the SFPUC is evaluating water supply alternatives that can provide a long-term reliable source to be stored in the expanded Los Vaqueros Reservoir. The SFPUC is evaluating two main categories of supplies: 1) transfers and 2) new water supplies generated by advanced treatment of wastewater, brackish water, or groundwater. This supply would provide 4 to 5 mgd of storage in normal and dry years. One alternative that has been studied extensively is the Bay Area Brackish Water Desalination (Regional Desalination) Project, which is a partnership between CCWD, SFPUC, the Santa Clara Valley Water District, and Alameda County Flood Control and Water Conservation District, Zone 7. The East Bay Municipal Utility District may also be involved.



Bay Delta Wetland

The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. The project relies primarily on available capacity in an extensive network of existing pipelines and interties that already connect the agencies, as well as existing wastewater outfalls and pump stations. The SFPUC would not directly receive desalinated water but would take delivery of water through a series of exchanges through LVE.

Project Partners

Contra Costa Water District (CCWD), East Bay Municipal Utility District (EBMUD), Valley Water, Zone 7 Water Agency and SFPUC

SFPUC Project Manager

Manisha Kothari

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
TBD	Dry Years (with storage) and/or All Years	Desalination / Transfers	Regional	TBD

Total Project Cost

Est. Capital Cost:	TBD	Est. Annual O&M:	TBD
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Institutional Complexity

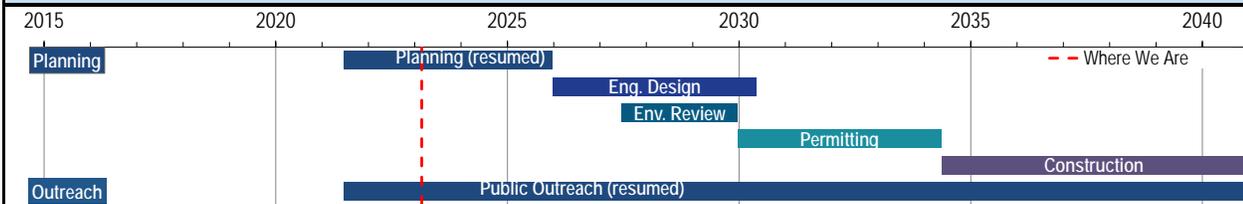
SFPUC Only Multi-Party Partnership

Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.

SFPUC Budget Information

10-Yr CIP Budget Allocation:	\$7.0M	Current Allocation:	\$3.5M
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Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning

18-Month Outlook

- Feasibility analysis to be included as part of separate alternative water supply study supporting Los Vaqueros Expansion
- Supply potential and delivery mechanism to be worked out among partners

Risks and Uncertainties

- Some impacts to sensitive fish may be unavoidable
- Water rights and permitting likely to be challenging
- Conveyance options are limited to transfer water to Regional Water System
- Exchange with CCWD's CVP supply is the only mechanism to move water into LVE

Benefits

- Availability during dry years
- Lower GHG emissions than seawater desalination
- Leverages existing infrastructure
- Storage option in Los Vaqueros provide dry year benefits

Calaveras Reservoir Expansion

Project Description

This storage project envisions the expansion of Calaveras Reservoir to store excess Regional Water System (RWS) supplies or other source water in wet/normal years. No expansion of water rights from the local watershed is anticipated. With the Calaveras Dam Replacement project in place, Calaveras Dam holds a capacity of 96,850 acre-feet, or 31 billion gallons of water. Through an expansion, up to an additional 289,000 acre-feet, or 94 billion gallons of storage could be realized. Calaveras Reservoir is owned and operated by the SFPUC for the benefit of RWS customers. No external partners are anticipated at this time. The expansion of Calaveras Reservoir would provide storage for additional water that can be available in all water year types. The proposed project would include raising the dam, increasing the capacity of the outlet structures and the spillway, and the addition of any transmission and pumping needed to bring water to Calaveras Reservoir. Constraints including water availability and conveyance will need to be evaluated.



Calaveras Reservoir

Project Partners

SFPUC Only

SFPUC Project Manager

Susan Hou

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
N/A	Drought Years and/or All Years	Local Storage	Regional	TBD

Total Project Cost

Est. Capital Cost:	TBD	Est. Annual O&M:	TBD
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Institutional Complexity

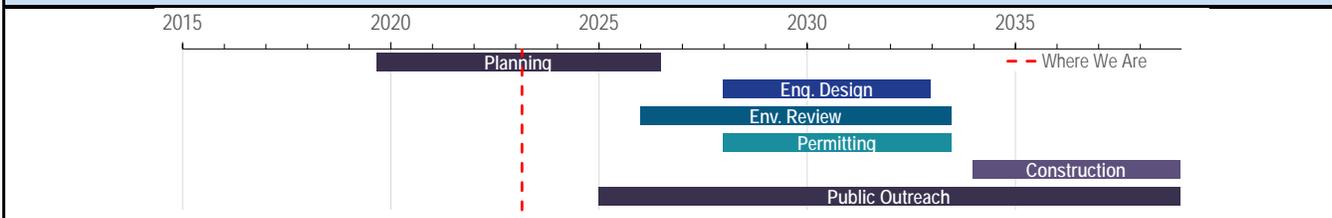
SFPUC Only } Multi-Party Partnership

Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.

SFPUC Budget Information

10-Yr CIP Budget Allocation:	\$7.5M	Current Allocation:	\$4.5M
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Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Planning</p> <p>18-Month Outlook</p> <ul style="list-style-type: none"> Consultant team identifying and evaluating conveyance alternatives 	<ul style="list-style-type: none"> Availability of additional water from the Tuolumne River to divert to storage 	<ul style="list-style-type: none"> Provides operational flexibility, particularly in dry years Increases storage capacity in the SFPUC's largest reservoir Increases utilization of Tuolumne River and other wet/normal year supply

Groundwater Banking

Project Description

Groundwater banking in the Modesto Irrigation District and Turlock Irrigation District (the Districts) service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would off-set the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, subsequently freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.



Irrigation in MID service area

Feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement.

Project Partners

MID and TID
Groundwater users within the MID/TID service areas that also receive surface water deliveries from the Districts

SFPUC Project Manager

Ellen Levin

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
Unknown	Drought Years	Groundwater / Storage	Regional	TBD

Total Project Cost

Est. Capital Cost:	TBD	Est. Annual O&M:	TBD
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Institutional Complexity

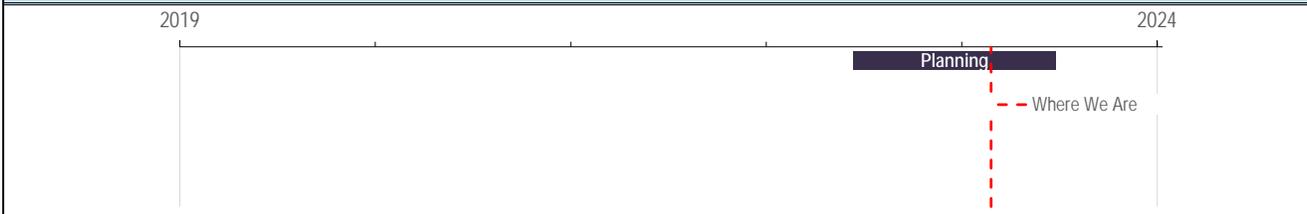
SFPUC Multi-Party Partnership

Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.

SFPUC Budget Information

CIP Budget Allocation:	\$0.0M		
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Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Conceptual

18-Month Outlook

- Evaluate next step based on negotiations of Tuolumne River Voluntary Agreement

Risks and Uncertainties

- Institutional challenges relating to water rights and basin management

Benefits

- Additional storage, with availability in dry years

Inter Basin Collaborations

Project Description

Inter-Basin Collaborations could include establishing a partnership between interests on the Tuolumne River 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, and this excess flow could 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.



Inter-Basin Collaborations could also include groundwater banking, utilizing the connections between the OID and MID surface water service areas.

Feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Any collaboration would need to protect the interests of all participants.

Reservoirs on the tributaries to the San Joaquin River

Project Partners

Tuolumne interests (SFPUC, MID, TID)
 Stanislaus interests (OID, SSJID, USBR)
 Groundwater users that also receive surface water for irrigation

SFPUC Project Manager

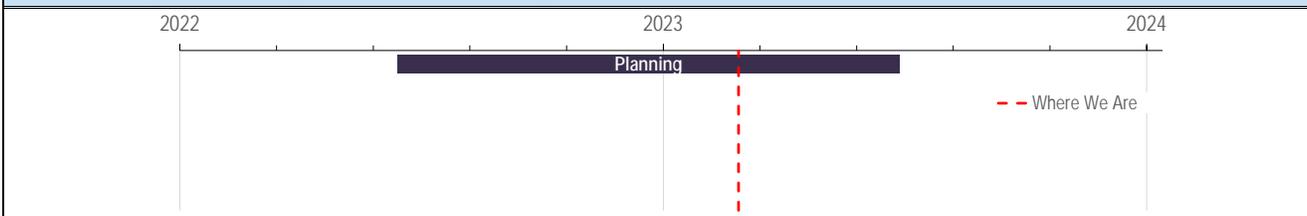
Ellen Levin

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
TBD	Varies	Storage or Exchanges	Regional	Unknown

Total Project Cost				Institutional Complexity	
Est. Capital Cost:	TBD	Est. Annual O&M:	TBD	SFPUC Only	Multi-Party Partnership
SFPUC Budget Information				Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.	
CIP Budget Allocation:	N/A				

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
Conceptual	<ul style="list-style-type: none"> Collaboration will require agreements and operational changes among many public and private parties 	<ul style="list-style-type: none"> Better management of basins can lead to greater regional water supply availability Water supply and environmental benefits
18-Month Outlook <ul style="list-style-type: none"> Meeting with other parties to be scheduled pursuant to Voluntary Agreement negotiations 		

Dry Year Transfers - Districts

Project Description

In 2008, the SFPUC Commission adopted the Water System Improvement Program (WSIP) Phased Variant to ensure that the SFPUC could continue to reliably meet the projected needs of its customers through 2030. One element of WSIP Phased Variant was a drought year water transfer. Coupled with the Regional Groundwater Storage and Recovery Project (GSR), this project was intended to ensure drought reliability in the planning horizon. The SFPUC pursued a long-term agreement to transfer 2 mgd from Modesto Irrigation District (MID) in drought years. However, the negotiations were terminated in 2012. Subsequently, SFPUC staff initiated discussions with the Oakdale Irrigation District (OID) to secure a similar drought year transfer. While no transfer has been secured to date, the SFPUC continues to pursue discussions with partners to explore potential transfer opportunities on the Tuolumne River and throughout the San Joaquin Valley.



Don Pedro Reservoir

Project Partners

SFPUC
Oakdale Irrigation District
Modesto Irrigation District

SFPUC Project Manager

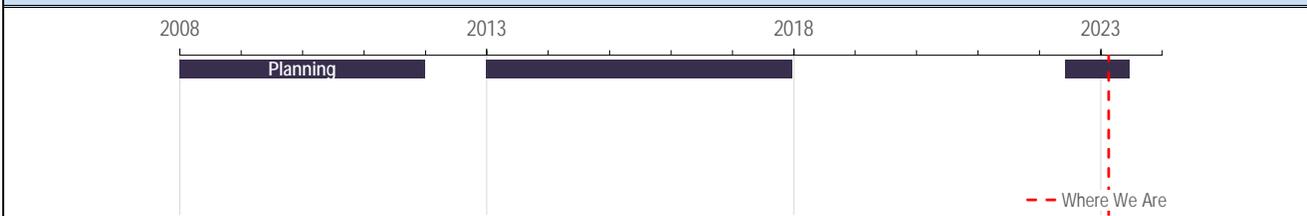
Ellen Levin

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
TBD	Drought Years	Transfer	Regional	TBD

Total Project Cost				Institutional Complexity	
Est. Capital Cost:	TBD	Est. Annual O&M:	TBD	SFPUC Only	Multi-Party Partnership
SFPUC Budget Information				Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.	
CIP Budget Allocation:	TBD				

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
Conceptual 18-Month Outlook • Resume discussions with Districts	<ul style="list-style-type: none"> Institutional arrangements / willingness of stakeholders Availability of supply 	<ul style="list-style-type: none"> Leverages existing supply and existing infrastructure

San Francisco Purified Water

Project Description

The San Francisco Purified Water Project is a concept that envisions providing new, local drinking water supply in San Francisco. The project would treat secondary effluent sourced from one or both of San Francisco's all-weather wastewater treatment plants through a multi-stage, multi-barrier advanced treatment process to produce water that meets state and federal drinking water standards. The treated water would then be blended at one or more of San Francisco's drinking water reservoirs. This treatment and distribution process is referred to as treated water augmentation, and State regulations are still under development (anticipated by 2023). The SFPUC would have no external partners in developing the project infrastructure, but close coordination with regulators, other utilities contemplating similar projects, and our communities will be very important throughout the planning and development of this project.



Southeast Treatment Plant

A building-scale research project (PureWaterSF) was completed in 2020 with grant support from the U.S. Bureau of Reclamation and the Water Research Foundation. Data revealed that the treatment processes operated as anticipated. A feasibility study has been completed identifying potential size, scale and other next steps. The project would also provide a tertiary recycled water supply of 1.2 mgd to meet the demands of dual-plumbed buildings in San Francisco that do not currently have a non-potable water supply source (previously reported as the Satellite Recycled Water Project). The SFPUC is continuing to move forward with planning and analysis for this project.

Project Partners

SFPUC only

SFPUC Project Manager

Manisha Kothari

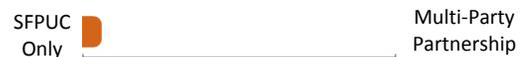
General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
4 mgd	All Years	Purified Water	Local	TBD

Total Project Cost

Est. Capital Cost:	TBD	Est. Annual O&M:	TBD
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Institutional Complexity

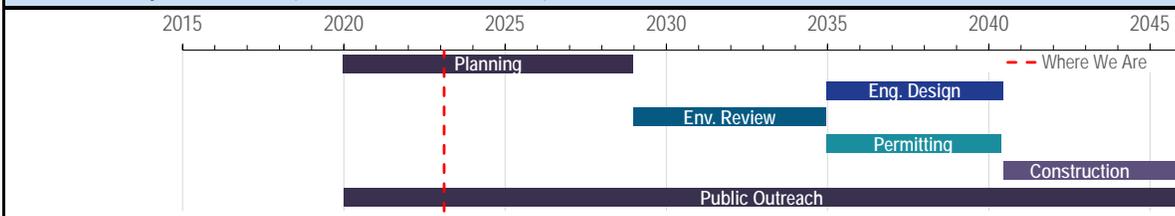


Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.

SFPUC Budget Information

10-Yr CIP Budget Allocation:	\$5.5M	Current Allocation:	\$0.5M
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Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
Research / Conceptual 18-Month Outlook <ul style="list-style-type: none"> Evaluate siting options Evaluate brine discharge and permitting needs Evaluate treatment options Initiate public outreach and engagement 	<ul style="list-style-type: none"> Regulatory framework not in place until after 2023 Need for additional testing, analysis and study Public perception 	<ul style="list-style-type: none"> Reduces Bay discharges Takes advantage of treated recycled water availability

Innovations Program

Project Description

This program supports development of new technologies and initiatives to demonstrate the feasibility of atmospheric water generation, heat recovery systems in non-potable systems, expanded leak detection, and breweries treating process water for reuse. Included in the Innovations Program are demonstration of new technologies and grant funds to support partnership opportunities. Examples of projects within the Innovations Program include grant funding to support the reuse of process water in breweries, and onsite reuse projects with heat recovery systems. The SFPUC is also testing leak detection technologies and will pilot the use of atmospheric water generation technology locally.



Fog on Golden Gate Bridge

Project Partners

Various

SFPUC Program Manager

Paula Kehoe

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
Varies	Varies	Local	Local	N/A

Total Project Cost

Est. Capital Cost:	TBD	Est. Annual O&M:	N/A
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Institutional Complexity

SFPUC Only Multi-Party Partnership

Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.

SFPUC Budget Information

CIP Budget Allocation:	\$0.5M
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Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Planning; Pilot Testing</p> <p>18-Month Outlook</p> <ul style="list-style-type: none"> Continue developing projects to demonstrate potential for water savings and supply 	<ul style="list-style-type: none"> Individual projects may be small, making them costly 	<ul style="list-style-type: none"> Identifies new technology opportunities to increase efficiency and water availability

Stormwater Capture and Reuse

Project Description

The SFPUC's efforts on capturing stormwater in San Francisco focus on collection of stormwater and harvesting of rainwater for reuse. The efforts range from capital investments in green infrastructure projects to city-wide mandates for new construction to manage stormwater runoff. The SFPUC also incentivizes collection and reuse of rainwater through rebates and encourages stormwater management through grant programs.



Griffith Yard Improvements Project: 12,000 square feet of green infrastructure to increase the diversity of onsite vegetation and help better manage stormwater in the area

Project Partners

Various

SFPUC Water Resources Point-of-Contact

Taylor Nokhoudian

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
Varies	Varies	Local	Local	N/A

Total Project Cost

Est. Capital Cost:	TBD	Est. Annual O&M:	N/A
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Institutional Complexity

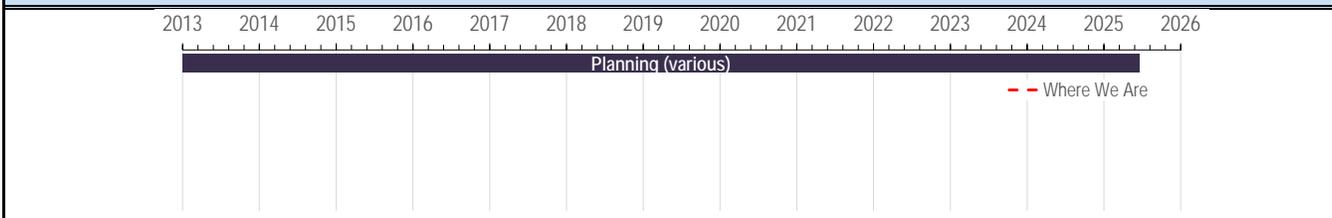
SFPUC Only Multi-Party Partnership

Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.

SFPUC Budget Information

CIP Budget Allocation:	N/A
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Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Planning</p> <p>18-Month Outlook</p> <ul style="list-style-type: none"> Continue developing opportunities and projects to capture and reuse stormwater 	<ul style="list-style-type: none"> Limited land availability in San Francisco Limitations of stormwater recharge into the local groundwater basin Finding sustainable solutions to the impacts of stormwater runoff such as water quality and treatment for the purpose of use 	<ul style="list-style-type: none"> Enhances community space and beautifies streets and improves street conditions and safety for bicyclists and pedestrians. Increases biodiversity and brings green to our neighborhoods and creates a more livable habitat for birds, native plants, and residents. Reduces Urban Heat Island Effect; improves air quality Reduces wastewater treatment costs and energy consumption and identifies new technology opportunities to increase efficiency of stormwater capture and reuse Enhances sustainability, water security, and resiliency by

Section 3. Program Fundamentals

3.1 Introduction

This section includes background information on the Alternative Water Supply (AWS) Program and is intended to serve as a program reference. It includes information on how the AWS Program was established, program goals, planning priorities, program schedules, and information on resources for program administration such as staffing, funding, and contracting. Much of the information included in this section will be the same from one quarterly report to the next. However, new information may occasionally be added to the section, and useful information presented in the upfront sections of previous quarterly reports may be moved into this section from time to time. When new information is added or if significant updates are made to previously included background information, the sections will be marked as “UPDATED”.

3.2 Purpose of the Program (UPDATED)

As the SFPUC plans to 1) meet environmental flow requirements and projected obligations for existing customers; 2) evaluate serving new permanent customers and providing additional supply for existing customers; and 3) prepare for future climate effects and other uncertainties through the 2045 water supply planning horizon, there is a need to look beyond current surface water supplies and operations of the SFPUC’s RWS and local groundwater sources. The AWS Program was established to evaluate new and diverse “alternative” water supply options such as expanding storage, groundwater banking, transfers, purified water (potable reuse), desalination, and technological innovations.

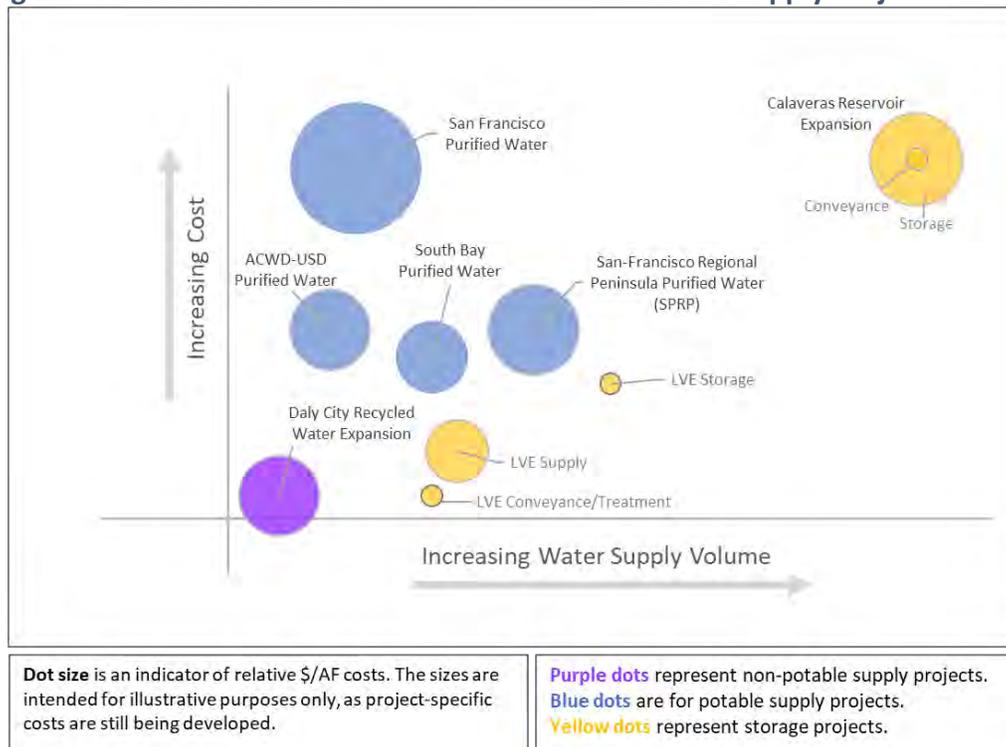
The AWS Program includes two regional storage expansion projects, one recycled water project, and three purified water projects. Under the Los Vaqueros Reservoir Expansion project, there are related projects to secure water supply and conveyance. In addition to these regional projects to augment dry-year supply availability, this report also tracks complementary local efforts and potential collaborations in the San Joaquin Valley that can impact the projected supply shortfall. The water supply projects in the San Joaquin Valley that would require partnerships with Irrigation Districts on the Tuolumne and/or Stanislaus Rivers would be analyzed in conjunction with negotiation efforts with the State on the San Francisco Bay/Sacramento-San Joaquin Delta Estuary Water Quality Control Plan (Bay-Delta Plan).

The AWS projects are at varied stages of planning and significant uncertainties about cost, volume and timing of supply availability remain. All the projects under consideration will require significant capital investments and ongoing operations and maintenance support. Storage projects can provide significant water supply volume and can be operated to maximize dry-year deliveries when the SFPUC’s anticipated water supply shortfall is the greatest, but they require water supply. Desalination and potable reuse projects offer supplies in the range of 5-12 mgd each, but will likely have significant permitting, water rights and other regulatory

considerations. They are also more difficult to operate intermittently for dry-year supply. The lowest-cost projects being considered will likely be the non-potable supply projects, but non-potable demands are increasingly limited, particularly in San Francisco. The tradeoffs associated with projects and other technical, institutional, operational, and financial considerations will continue to be studied and reported on through the planning phase of project development for the AWS projects.

The relative volume and cost of the alternative water supply projects are shown in **Figure 3** below.

Figure 3. Relative Volume and Cost of Alternative Water Supply Projects



3.3 Planning Needs, Priorities, and Service Objectives (UPDATED)

The need to pursue various alternative water supply options stems from the significant water supply shortfall that the SFPUC faces within the planning horizon and because traditional supplies are increasingly limited. While the supply and demand projections may continue to evolve over time, the adaptive planning approach under the AWS Program is focused on being able to explore and plan a diverse set of water supply options to address the anticipated supply shortfall when it arises while continuing to provide reliable and sustainable water deliveries to all of the SFPUC’s retail and wholesale customers.

The anticipated gap between supply and demand in future droughts is most significantly affected by the need to make up for new instream flow requirements on the Tuolumne River. In

December of 2018, the State Water Resources Control Board (State Board) adopted amendments to the Bay-Delta Plan. For the SFPUC, the effect of this action is a requirement to leave 40% of unimpaired flows in the Tuolumne River to achieve fishery improvements in the Bay-Delta system.

The SFPUC is pursuing litigation against the State Board and is simultaneously seeking a compromise solution through a Voluntary Agreement with the State of California to reduce the projected shortfall. In the meantime, water supply projects take years and even decades to plan and implement. Complexities of implementing alternative water supply projects can require even longer lead times for planning than traditional water supply projects. Thus, there is an urgency to plan several new water supply opportunities that provide dry-year reliability to continue meeting the highest priority needs and delivering reliable service. In addition to helping in filling the projected gap in systemwide water supplies, the AWS projects can increase the diversity of the supply sources and increase reliability for all SFPUC customers.

In the AWS planning framework, the planning priorities, which were first articulated for the Commission in August 2016, have been slightly modified over time and are expressed as follows:

1. Meet regulatory requirements including instream flow releases (*obligatory*)
2. Meet existing obligations to existing permanent customers (*obligatory*)
3. Make current interruptible customers permanent (*policy decision*)
4. Meet increased demands of existing and interruptible customers (*policy decision*)

In conjunction with these planning priorities, the SFPUC considers the level of service (LOS) Goals and Objectives related to water supply and sustainability when planning for new water supply opportunities. The key LOS Goals and Objectives relevant to AWS planning are as follows:

- Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts
- Diversify water supply options during non-drought and drought periods
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat
- Provide operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicable here)

Together, the planning priorities and LOS Goals and Objectives provide a lens to consider the water supply options and opportunities to meet the foreseeable water supply shortfall.

3.3.1 Planning Objectives

Consistent with the SFPUC's LOS Goals and Objectives, the AWS Program aims to plan for and develop new capital projects that can ensure the delivery of reliable water service to its customers throughout the planning horizon. Maintaining reliable water service includes balancing water demands with supply availability, and it also includes having the necessary treatment, conveyance, storage, and distribution infrastructure to support water supply deliveries.

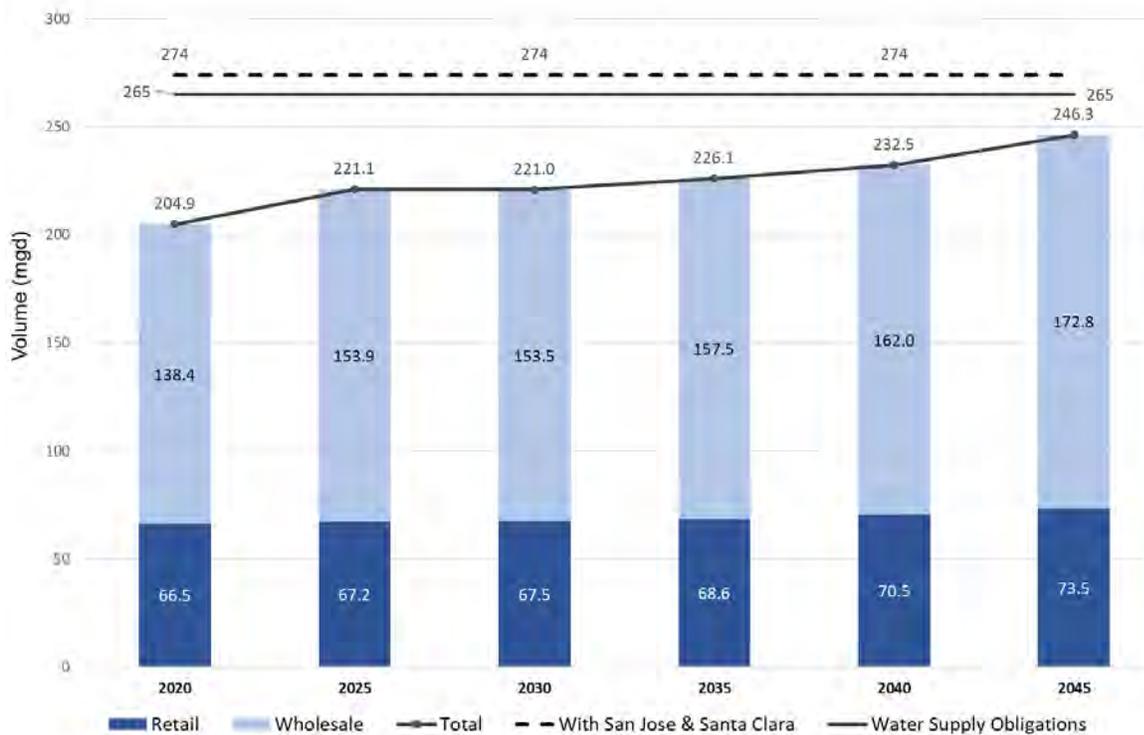
The SFPUC has contractual obligations to provide 184 mgd (Supply Assurance) to Wholesale Customers. Similarly, the SFPUC provides 81 mgd to retail customers. Together, they represent 265 mgd of water supply delivery obligations. San Jose and Santa Clara, interruptible customers of the SFPUC, have requested a minimum permanent supply of 9 mgd and up to 15.5 mgd of dedicated supply. The Commission will have to make a policy decision by December 31, 2028 on whether to provide this new supply assurance. For planning purposes, the AWS Program includes 9 mgd as a potential future obligation for San Jose and Santa Clara, enabling the Commission to understand the future total obligations if it were to consider making this commitment in the future.

3.3.1.A Demand and Supply Uncertainties

For the SFPUC, water demand constitutes the retail and wholesale customer demand for water provided through the RWS. The SFPUC monitors water delivered to the customers in San Francisco on a regular basis. In the wholesale service area, the actual and projected RWS purchases and total water demand for the 26 Wholesale Customers is reported by BAWSCA on an annual basis. **Figure 4** below shows the current and potential future obligations, as well as demand projections consistent with the SFPUC's 2020 Urban Water Management Plan.

In March 2022, BAWSCA published the FY2020-21 Annual Survey that reflects the Urban Water Management Plans and other planning conducted by the Wholesale Customers. The FY2020-21 Annual Survey projects higher demand for water provided through the RWS or RWS purchases (172.8 mgd) for 2045, than those shown in the previous AWS Quarterly Reports (162.7 mgd). The increase in the projections reflects the higher projected RWS purchases for several Wholesale Customers due to reasons such as reduced reliance on other water supply sources and increase in water demand in their individual service areas. For comparison purposes, Wholesale Customers have near-term purchase projections totaling 153.9 in 2025.

Figure 4. SFPUC’s Contractual Obligations and Projected Demands



Meanwhile, uncertainties remain on the supply side of the equation, which inform the planning objectives and trigger the exploration of new water supplies. Based on the SFPUC’s system modeling, the RWS would have been able to deliver 257 mgd in 2045 under planned drought conditions and current water supply policies, including rationing⁸ and the design drought sequence⁹ used as part of the Water System Improvement Program (WSIP). However, implementation of the Bay-Delta Plan, as amended, would reduce supply availability during droughts by 93 mgd. As a result of less system supply being available, the associated rationing that is a percentage of deliveries, would add a lower amount of water to the supplies resulting in another 12 mgd shortfall. Therefore, the anticipated water supply availability from the RWS in a 2045 dry-year scenario with the Bay-Delta Plan implemented would be 152 mgd. Changes in precipitation associated with climate change, new permitting requirements and regulations, and future curtailments are additional factors that can affect supply availability within the planning horizon.

⁸ The policy of rationing pertains to percentage of supplies withheld from customers adding to the supply availability during dry years.

⁹ The design drought sequence is an 8.5-year drought sequence based on the drought that SFPUC has historically experienced and allows the SFPUC to model how the RWS storage would perform under extremely dry conditions. The design drought sequence used under the WSIP serves as a benchmark to measure the future water supply gap.

3.3.2 Planning Approach: Plan for Obligations, Build for Demands

Recognizing that through the 2045 planning horizon 1) projected demands are lower than the SFPUC’s obligations and 2) there are uncertainties around supply availability, the AWS team takes a stepwise planning approach to meet customer obligations and implement new projects. It is important to note that while the SFPUC must prepare to meet its obligations by identifying feasible water supply and associated capital improvement projects, implementation of these large infrastructure projects may be deferred until the need is more imminent for the SFPUC to fill the anticipated shortfall in water deliveries from the RWS. Through the planning process, key decision points for each project must be identified with an understanding of its own risks and benefits, so that the SFPUC can make informed decisions at multiple points within the project on whether and how to proceed. With this adaptive approach, the SFPUC can minimize the financial and operational risks of overcommitting or having insufficient water supplies to fill the gap between demand and supply as both continue to evolve.

Developed in line with this framework, the focus of the current planning effort and the AWS Program is on filling the projected water supply gap that is calculated based on the difference between available system supplies on one hand, and contractual obligations and projected demands on the other. With the variability in the obligations and projected demands, it is important for the AWS team to simultaneously, aggressively plan for obligations and advance those projects that will ensure that projected demands are met. The matrix below shows the water supply shortfall under different planning scenarios.

	Water Supply Available with Bay-Delta Plan as Amended (mgd)*	Current and Potential Obligations (mgd)**	Water Supply Shortfall (mgd)
Planning for Obligations in a Dry Year (2045)	152	265 + 9	-122
Building for Demands in a Dry Year (2045)***		246	-94

*Water supply accounts for the 93 mgd shortfall anticipated to result from the implementation of the Bay-Delta Plan and water supply available from water rationing in drought.

**Obligations for permanent Wholesale Customers (184 mgd), retail allocation (81 mgd), and requested supply guarantees for San Jose and Santa Clara (9 mgd).

***Projected retail water demand of 73.5 mgd (accounting for the demand offsets or the reduction resulting from conserving water and implementation of onsite water recycling programs in San Francisco) combined with projected Wholesale Customer water demand on RWS of 172.81 mgd.

3.4 Making San Jose and Santa Clara Permanent Customers (UPDATED)

Currently, the Cities of San Jose and Santa Clara are interruptible customers of the SFPUC. While the SFPUC has never interrupted water supply to San Jose and Santa Clara, the 2009 Water Supply Agreement (Amended and Restated in 2018) with the Wholesale Customers allows the SFPUC to issue a conditional notice of termination of supply if sufficient long-term water supplies from the RWS are not available. As customer demands increase and uncertainties loom regarding future water supply availability, San Jose and Santa Clara have requested to become permanent customers of the SFPUC. Permanent status would give San Jose and Santa Clara the ability to guarantee water supply availability to support planned growth in the northern portion of each of these cities.

For San Jose and Santa Clara to become permanent customers of the SFPUC, an additional 9 mgd of new, year-round supplies would be needed to meet historic demand levels and up to 15.5 mgd would be needed to meet planned demand through 2045. The water supply shortfall for the AWS Program accounts for the 9-mgd deliveries to San Jose and Santa Clara as part of anticipated wholesale customer obligations.

Customer	Historic Demand		Projected Demand
San Jose	4.5 mgd	→	9 mgd
Santa Clara	4.5 mgd	→	6.5 mgd

Under the 2009 Water Supply Agreement, as amended in 2018, the SFPUC is committed to making a decision about whether to make San Jose and Santa Clara permanent customers by December 31, 2028. In order to give San Jose and Santa Clara permanent status, the SFPUC would have to identify specific water supplies based on which to provide individual supply guarantees at the combined historic level of 9 mgd. Environmental review for the identified project(s) should be complete for the SFPUC to be able to select water supply alternatives to implement.

Through the evaluation of alternative water supplies, the SFPUC intends to identify supplies that can contribute to filling the dry-year supply shortfall and help the SFPUC Commission make a policy decision regarding permanent status for San Jose and Santa Clara by 2028. If the Commission chooses not to make San Jose and Santa Clara permanent, the total estimated obligation in 2045 would not include 9 mgd.

The SFPUC is pursuing a purified water opportunity in the South Bay (**Section 1.1**) with San Jose and Santa Clara, which is described now as the South Bay Purified Water Project in **Section 2.1**.

3.5 New Alternative Water Supplies (UPDATED)

While the RWS will remain the backbone of the SFPUC's wholesale and retail supply into the future, stresses on that system and new water supply shortfall require that alternative water supplies are considered along with creative and sustainable new solutions within the planning horizon to remain resilient. In addition to the opportunities identified, SFPUC staff are also continuing to seek more options. The supply categories that are being used for the AWS planning effort are described in the paragraphs below.

Storage (volume dependent on supply availability and conveyance). Both surface water and groundwater storage provide opportunities to hold water when it can be conserved so that it can be available when it is needed the most (dry years). The amount of water storage that can be used is dependent on the amount of additional supplies that could be secured as well as the capacity of the conveyance facilities that connect storage to the RWS. The Calaveras Reservoir Expansion Project and the LVE Project would provide new storage opportunities. The Daly City Recycled Water Expansion Project would offset groundwater pumping in Colma, leaving more groundwater in the South Westside Basin, supporting the reliability of the ongoing Groundwater Storage and Recovery Project during dry years. In addition, the SFPUC is exploring opportunities for inter-basin collaborations and regional groundwater banking in the Tuolumne River watershed. Expanding the capacity of Hetch Hetchy Reservoir was considered but is not being pursued in the planning horizon at this time.

Dry Year Transfers (~2 mgd). A transfer of water from another agency utilizing existing facilities during dry years would be an ideal way to efficiently utilize existing water supplies. However, during droughts is when there is a significant shortage in water supply, so securing dry-year transfers has proven difficult in the past due to institutional complexities. SFPUC staff are continuing to pursue all feasible opportunities.

Purified Water (Potable Reuse) (~10-25 mgd). Potable reuse is a process by which treated effluent from a wastewater treatment plant undergoes advanced treatment, including filtration, reverse osmosis, disinfection, and advanced oxidation, to produce purified water (the product) that is comparable to drinking water standards. Depending on the nature of the project, this purified water can be used to augment surface water supplies, recharge a groundwater basin, or be blended in a drinking water reservoir for direct distribution. The latter form of potable reuse (also termed as treated water augmentation) is not yet regulated, but expected to be in 2023. Several utilities in California are considering purified water projects.

Unlike dry-year transfers or storage projects that can enhance drought period reliability, potable reuse projects are generally designed to be operated in all years, including wet/normal years when use and storage capacity for that water may be limited or unavailable. In addition to pursuing these projects, SFPUC staff continue to look for design and technology solutions for intermittent or scalable use.

Desalination (~5 mgd). The Brackish Water Desalination Project could provide up to 5 mgd of new supply for the SFPUC. The proposed project would be located in East Contra Costa County with partners including CCWD, Zone 7 Water Agency and Valley Water. EBMUD and ACWD may play an active role in the project in the future. Developed in conjunction with the LVE Project, as is currently being evaluated, this project would be used to provide greater dry-year supply reliability.

3.5.1 Water Supply Planning Outside the AWS Program (UPDATED)

In 2008, the SFPUC Commission adopted the Phased WSIP, a variant of the proposed program that included 10 mgd of conservation, recycled water and groundwater in San Francisco, and 10 mgd of conservation, recycled water and groundwater in the wholesale service area.

San Francisco is implementing its 10 mgd increment of local supply through the Local Water Supply Program. The program includes the San Francisco Groundwater Supply Project to augment San Francisco's retail water supply with local groundwater, and several recycled water projects, including the Westside Enhanced Water Recycling Project, to provide non-potable water for irrigation.

Individual wholesale customers have implemented active conservation programs in their service areas to maintain low per capita use and are similarly investing in groundwater and water recycling programs to offset potable demands. The SFPUC does not track non-RWS supplies in the wholesale service area; however, staff shares best practices and coordinates on planning and messaging through BAWSCA and common planning efforts.

It's important to note that the projects identified to meet the 10 mgd local water supply commitments under Phased WSIP were being planned well before the anticipated water supply shortfall of 94 mgd to 122 mgd was identified; therefore, they are assumed as part of the baseline for retail demands for water from the RWS and are not counted toward addressing the water supply shortfall that is the focus of the AWS Program.

3.6 Planning for Implementation (UPDATED)

If all the projects identified through the SFPUC's current AWS planning process to date could be implemented, there would still be a supply shortfall to meet dry-year demands with San Jose and Santa Clara all-year water supply demands included. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect SFPUC's ability to implement it.

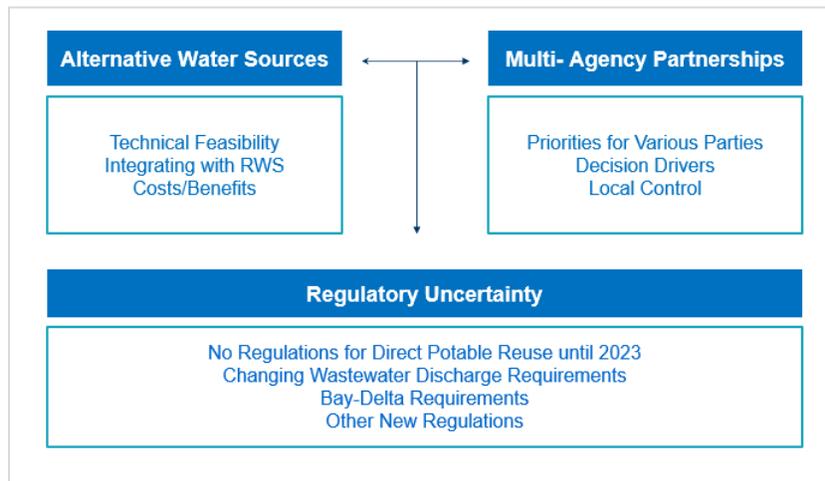
Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or the water supply needs change significantly - the SFPUC will continue to plan, develop, and implement all project, partnership and policy opportunities that can help bridge the anticipated water supply gap. In 2019, a survey was completed among water and wastewater agencies within the SFPUC service area to try to identify additional opportunities

for purified water. Such opportunities remain limited, but staff continue to pursue all possibilities, and water supply options identified here may be augmented over time.

3.7 Trends and Risks

Of the regional water supply options being considered, there is only one (Calaveras Reservoir Expansion) that does not involve multi-party partnerships with institutional complexities. In all other cases, the SFPUC relies on partner water and wastewater utilities to move forward due to jurisdictions over water sources or infrastructure. Therefore, other agencies’ priorities, decision-making processes, funding, and other constraints are also factors in the feasibility, cost, and schedule of these regional projects (**Figure 5**).

Figure 5. Special Considerations for the Alternative Water Supply Program



Another risk facing some of the projects is regulatory uncertainty. While the State Board has adopted regulations for some forms of potable reuse, including groundwater injection and surface water augmentation, it has yet to pass regulations concerning direct potable reuse. Without clear regulatory guidance, projects with direct potable reuse components are at risk due to uncertainties concerning water quality criteria, treatment technologies, and overall feasibility.

3.8 Timeframe (UPDATED)

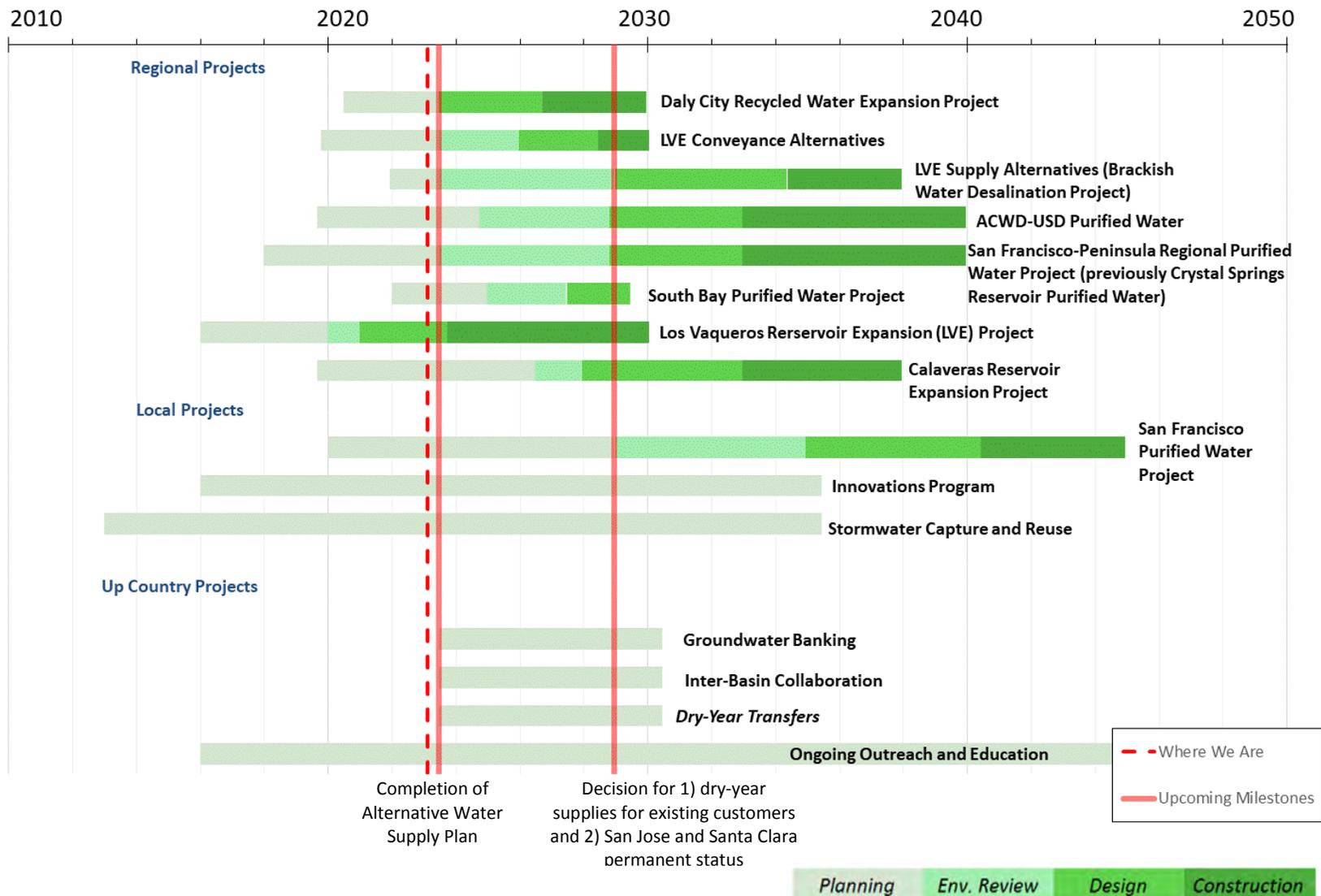
Planning is progressing for the proposed AWS projects. Given the level of complexity and uncertainty, project implementation is expected to take between 10 and 30 years. As planning continues, the timing of when the water supply shortfall might materialize will be taken into account such as implementation of Bay-Delta Plan requirements during the next drought or the decision by 2028 to make San Jose and Santa Clara permanent customers.

As with traditional infrastructure projects, there is a need to progress systematically from planning to environmental review, and then on to detailed design, permitting and construction of the AWS projects. Given the complexity and inherent challenges described in the previous sections, these projects will require a long lead time to develop and implement.

Typically, a minimum of 10% design is needed to obtain the level of project detail required to begin preparation of an environmental document. To achieve this, the SFPUC will need to work closely with its partners to complete the feasibility phase of the projects and make decisions about which projects to pursue no later than 2023. Environmental review for the Los Vaqueros Reservoir Expansion Project and the Daly City Recycled Water Expansion Project are complete. Other AWS projects described in this report are moving toward completing feasibility studies by 2023.

A high-level schedule overview of each AWS project is shown on the next page. The AWS Plan development is also in process and will be completed by July 2023. As shown in the schedule, the AWS Plan will be developed concurrently with ongoing project-level analyses.

Proposed Programmatic Schedule



3.9 Staffing

In order to advance the planning for several of the AWS projects expeditiously, the SFPUC established a new group within the Water Resources Division in 2020. The group has four project managers: two focused on detailed project-specific efforts; one focused on local and regional projects and coordination with other resource areas; and one dedicated to long-term planning including the development of the AWS Plan by 2023. The group is led by planning manager who focuses on program management and implementation including cross-project planning.

3.10 Water Supply Task Force

Success in planning water supply projects will ultimately depend on the ability to operate and integrate the new supplies into the existing water supply network. This goal is even more challenging when the new water supplies are from very different sources from the existing surface water and groundwater supplies.

To advance the AWS projects in a thoughtful way, the SFPUC has a Water Supply Task Force that brings together a cross-functional group including planning, policy, environmental management, operations, water quality, finance, legal, and communications resources. Through early and frequent communications on all of the proposed projects, this group helps in anticipating long-term risks and challenges and addressing them early in the planning process. The Water Supply Task Force convenes every two weeks and has continued to do so remotely since March 2020.

3.11 Regional Project Funding (UPDATED)

On February 14, the SFPUC Commission approved a 10-year capital plan, which includes funding for AWS regional project planning of \$131.5 million between FY 2023 and FY 2033, including current appropriations. The AWS Plan, which is due to the Commission by July 1, 2023, will include specific project recommendations and associated funding requests for the Commission to consider. If the SFPUC moves forward with some or all of the AWS projects described in this report, appropriate funding requests will be included in future budget cycles.

3.12 Professional Services Contracts

The Water Resources Division is managing two as-needed joint venture contracts with a capacity of \$4 million each with 1) Carollo Engineers and Water Resources Engineering (WRE) and 2) Woodard and Curran and SRT Consultants. Some of the capacity in these contracts will be used for planning studies associated with the AWS Program, as needed to meet planning

objectives. These contracts enable the SFPUC to move quickly to evaluate specific planning needs. If necessary, other as-needed contracting capacity through the Water Enterprise may also be available. It is anticipated that additional professional services support will be utilized to advance planning efforts.

3.13 Adapting to an Uncertain Future (UPDATED)

The AWS Program is intended to identify, screen, and plan for new alternative water opportunities that can help address the SFPUC's anticipated water supply shortfall in dry years over the planning horizon. Recognizing that these projects would introduce new sources of supply and require new partnerships, this program necessarily requires an integrated and holistic planning approach, both within the SFPUC and with external partners. Given the uncertain nature of planning needs, it also requires some built-in adaptability and flexibility. As this section described, the AWS Program has the infrastructure and resources needed to continue to plan in a changing environment.