

Alternative Water Supply Program Quarterly Report

March 2022



Photo: Sunol Water Temple, 2007

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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 and local water supply, storage and conveyance projects that are being planned to meet anticipated needs in the SFPUC's service area. 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 2021 and February 2022. 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 different *Quarterly Highlights* each quarter. The highlights provide detail on one or two key themes and information on how they relate 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 discussion of the process for the development of the AWS Plan**. The AWS Plan is scheduled to be completed and presented to the Commission by July 2023.

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

The Alternative Water Supply (AWS) Program is evaluating new projects that will help meet future water supply needs in the San Francisco Public Utilities Commission (SFPUC) service area. This Program looks beyond existing infrastructure and surface water supplies of the Regional Water System (RWS) and local groundwater sources, 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), desalination as well as technological innovations and other tools that can increase supply or reduce demand.

Planning for and implementing alternative water supplies require a comprehensive and detailed planning effort that considers several interrelated planning challenges, many of which are different than those faced for traditional water supply planning at the SFPUC. These planning challenges include new and potential regulations, multi-party partnerships, and approaches for integrating supplies into the existing water system. Additionally, as with any long-term water supply planning effort, the SFPUC must also contend with future uncertainties such as instream flow needs, climate change, and future curtailments during droughts. These planning challenges and uncertainties highlight the importance of being thoughtful and adaptive in our planning efforts for the AWS Program.

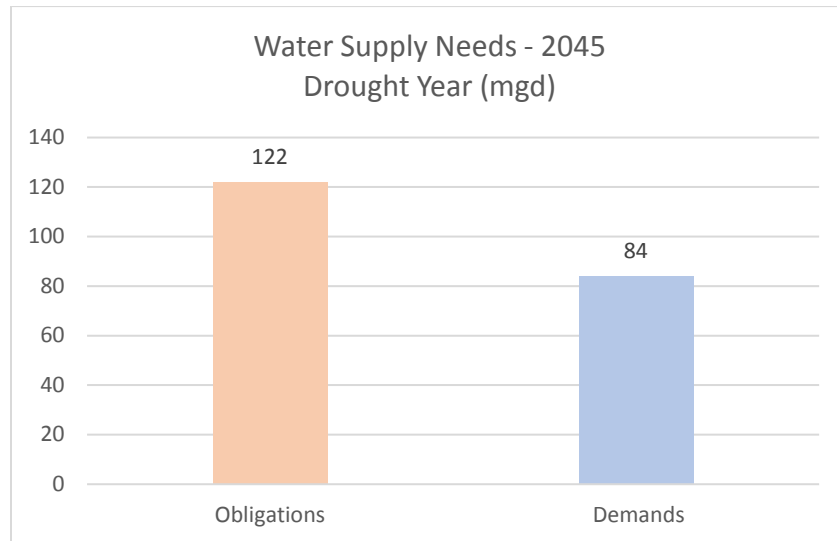
The central planning objective of the AWS Program is to meet anticipated water supply needs in drought years in the SFPUC’s retail and wholesale service areas through the 2045 planning horizon. The water supply needs account for 1) the potential instream flow requirements that would affect available water supplies; 2) the SFPUC’s contractual obligations to retail and wholesale customers, and an additional 9 million gallons per day (mgd) for the two interruptible customers² (Cities of San Jose and Santa Clara). Based on the difference between the SFPUC’s anticipated total obligations and expected supply availability in the RWS, the additional water supply need would be 122 mgd by 2045. However, demands over the planning horizon are projected to be lower than the obligations.³ Comparing demand projections to water supply availability in 2045, the water supply need would be 84 mgd (**Figure 1**).

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 The SFPUC is contractually obligated to making a decision about whether to make San Jose and Santa Clara permanent customers by December 31, 2028.

³ Demands for supply from the RWS account for savings from conservation and offsets from non-RWS water supplies and onsite water recycling.

Figure 1. Anticipated Water Supply Needs in 2045



1.2 Quarterly Highlight

The AWS Program was formally established in 2020 with a commitment to develop a guiding AWS Plan by 2023. This Quarterly Report represents the midpoint of this initial planning phase. Reflecting on the work that has been done and looking ahead to the goal of the AWS Plan, this quarterly highlight describes the intent and process for preparing the AWS Plan by July 2023.

1.2.1 Preparing the AWS Plan (NEW)

1.2.1.A The Purpose of the AWS Plan

In Resolution No. 20-0138 adopted on June 23, 2020, the SFPUC directed staff to “complete development of an Alternative Water Supply Plan to implement a collection of projects to achieve a water supply goal established through the AWS Planning Program... no later than July 1, 2023”.

The AWS Plan is a planning document that will support Commission decision-making on whether to advance projects toward implementation and will include:

- A discussion of the supply and demand drivers that form the basis of the water supply needs that the AWS Program is slated to meet;
- A description of how AWS projects and other actions can be implemented to meet the water supply needs and be consistent with the established policies and plans of the SFPUC such as the Level of Service (LOS) goals, the 2020 Strategic Plan, and OneWaterSF;
- Summaries of the technical, institutional, and financial feasibility of the projects identified under the AWS; and

- Information that will help assess the AWS projects, both individually and collectively.

AWS Quarterly Reports, such as this one, serve as progress reports on the AWS Program to the Commission. They provide regular updates on the detailed planning activities related to the evaluation of individual projects. They also include relevant topics that affect the entire Program, such as the status of planning for permanent status for San Jose and Santa Clara.

By contrast, the AWS Plan is intended to help the Commission make informed decisions about specific new investments for additional planning, environmental review, detailed design, or construction of AWS projects.

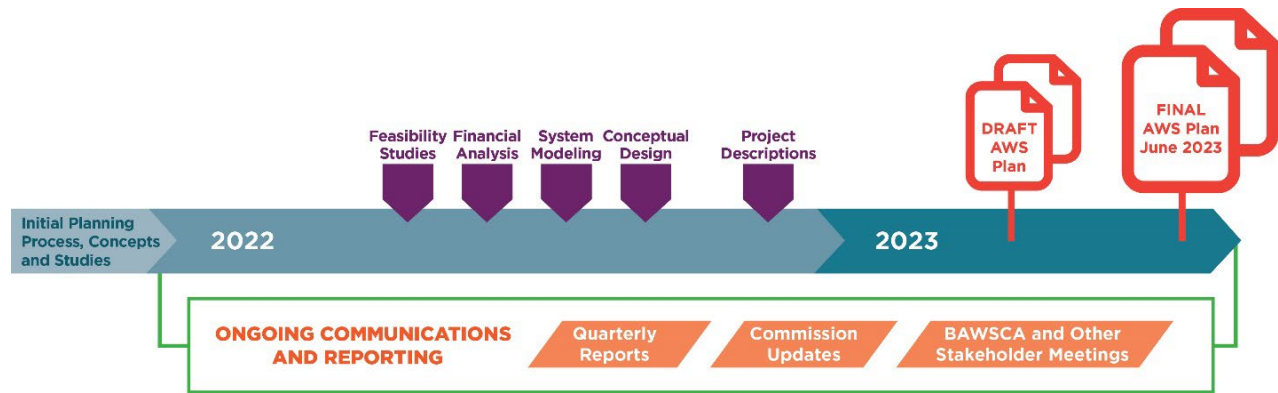
1.2.1.B The AWS Plan Process

Preparation for the AWS Plan has begun. Staff have reviewed the LOS Goals and how they would apply to AWS Projects (described further in [Section 3.3](#)). With retail demands recently updated for the 2020 Urban Water Management Plan, staff have also refined the water supply needs for the Program.

As several feasibility studies conclude later in 2022, the AWS team will be defining the next critical project milestones that will require new SFPUC investments and commitments next year. These project milestones will be the basis for the Commission's decision-making by July 1, 2023. As these decisions are defined, staff will extract pertinent technical, institutional, and financial data to provide a clear understanding of the risks, benefits, and implications of continued support for a project or a collection of projects.

Even with the implementation of all the AWS Projects described in this report, the SFPUC is not able to meet the current estimated water supply need of 84 mgd in 2045. Staff continue to identify and are beginning to evaluate new projects that can provide additional water supply benefits. These opportunities are limited and will rely on a combination of purified water, desalination, and storage. Still, more is needed given the magnitude and timing of the projected needs. Over the course of the coming year, staff will identify and evaluate potential actions to be considered by the Commission that can close the remaining gap. The AWS Plan will include discussion of how the SFPUC can achieve its water supply need. **Figure 2** below illustrates the process of preparing and completing the AWS Plan by July 2023.

Figure 2. The AWS Plan Preparation



As shown in Figure 2, programmatic and project-specific analyses such as feasibility studies, financial analysis, system modeling, and conceptual design will continue through the year and will be incorporated along with project descriptions in the Draft AWS Plan. Communications through AWS Quarterly Reports, Commission meetings, and meetings with BAWSCA and other stakeholders will be ongoing through the AWS Plan preparation. Not shown here, internal cross-functional coordination within the SFPUC is also ongoing to help guide the planning process and the development of the AWS Plan.

1.3 Ongoing Program Activity Updates

1.3.1 Status of Ongoing Coordination with San Jose and Santa Clara (UPDATED)

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

Planning of alternative water supplies is proceeding with the intention to be able to make San Jose and Santa Clara permanent customers of the SFPUC. Based on the request from San Jose and Santa Clara, that means providing at least 9 mgd of additional water supply guarantees to the two cities collectively. However, consistent with the SFPUC’s planning priorities, the SFPUC must first meet instream flow requirements and meet ongoing obligations to existing permanent customers before making interruptible customers permanent or considering meeting increased demands of existing and interruptible customers. Distinct from San Jose and Santa Clara’s all-year needs, meeting our existing obligations requires securing dry year supplies.

As SFPUC staff evaluate the technical and institutional feasibility of each of the projects included in the AWS Program, the timing, availability and location of the water supply benefits associated with the projects are being considered. With these criteria, the SFPUC can review projects for their suitability as drought supply for existing permanent customers and also their suitability for meeting the needs of San Jose and Santa Clara. Depending on location and availability, a purified water project could be better suited to meeting San Jose and Santa Clara’s needs rather than the drought needs of existing permanent customers alone.

Since August 2020, the Bay Area Water Supply & Conservation Agency (BAWSCA) has facilitated regular 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 are working together to identify new project opportunities that may provide multiple water supply benefits as well.

Activities in this Quarter

This quarter, SFPUC staff, along with staff from the Cities of San Jose and Santa Clara began developing a scope of work to develop a purified water concept and alternatives to determine preliminary technical feasibility. Contracting for this study will be carried out through the SFPUC's Water Resources As-Needed contract and will be initiated in the next quarter. If feasible, a purified water project in the South Bay could be a dedicated supply source to consider permanent status for San Jose and Santa Clara.

Section 2. Status of Projects

Staff are currently studying the feasibility of both regional and local projects that can contribute to meeting the needs and priorities identified for this planning effort. Three projects in the San Joaquin Valley (Upcountry Projects) have also been identified and planning for those is linked to the negotiations for the Bay-Delta Plan. Collectively, these projects represent new water supplies, local supply opportunities, a study of conveyance options, an innovations program, a potential local policy option, and a water transfer simulation that can help answer some planning questions. This section provides a status of each of these efforts, which are organized geographically and shown in **Figure 3**.

Each project status discussion that follows in Section 2.1, 2.2, and 2.3 includes the following sections: *Project Background* and *Current Planning Considerations*, which is included for purposes and context, and sections on *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 3. 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 Partners & Interests

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

Project Background

This project can make an additional 0.7 mgd of groundwater available in the South Westside Basin for drought supply. The project is envisioned to serve 13 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 (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.

Current Planning Considerations (UPDATED)

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

- 1) How much recycled water will the irrigation customers need based on future demands?
- 2) How will the responsibilities and costs be allocated among the project partners?

Activities this Quarter

SFPUC staff and the consultant team completed the alternatives analysis this quarter. The report shows that the baseline recycled water project, on balance, is the most favorable alternative considering benefits, costs, engineering, and operational complexities. The report includes recommendations on potential next steps to phase in an Indirect Potable Reuse (IPR) component at a later stage to maximize beneficial reuse and groundwater recharge.

The consultant team is continuing to update the cemetery demands on their existing expansion plans, which would help clarify whether there is sufficient recycled water supply to meet future demands as well as potential effects on groundwater basin storage.

Regular meetings with partner agencies, Daly City and Cal Water continued this quarter. Main topics of discussion include different approaches on how the cost share could be structured among the partners, additional studies Cal Water needs to facilitate design of the storage tank, and strategies for outreach to cemeteries.

Upcoming Activities

In the coming quarter, SFPUC will have a better understanding of future cemetery demands and will work with the partners to develop more details about the cost share and other terms of a preliminary agreement to move the project into design, and consider additional outreach to the cemeteries.

2.1.2 ACWD-USD Purified Water

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 USD's treated wastewater. Purified water produced by advanced water treatment at USD 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 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 RWS. 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 of two alternatives that the partners wish to study, and what are the associated costs and infrastructure needs?

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 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. Draft chapters on treatment, conveyance, and groundwater have been distributed for review by the partner agencies. .

Upcoming Activities

In the coming quarter, the consultant team incorporate feedback from the Partner agencies on the feasibility analysis and cost estimates.

2.1.3 Crystal Springs Purified Water (PREP)

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	Increase dry year supply

Project Background

The Crystal Springs Purified Water (also referred to as the Potable Reuse Exploratory Plan or PREP) Project is a purified water project that could provide 6-12 mgd of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through 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 pipeline 10-20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Early studies analyzed the feasibility of treatment and distribution and provided feasible scenarios for institutional structure and costs.

Current Planning Considerations (UPDATED)

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

- 1) What are the outstanding planning needs for the project in order to be ready to initiate CEQA?
- 2) How will a new water supply in Crystal Springs Reservoir affect water quality and operational needs of the RWS?

Activities This Quarter

This quarter, the SFPUC, partner agencies and the consultant made significant progress and are close to completing Phase 3 feasibility study and moving toward a Basis of Design document. The partners have agreed to focus on a phased hybrid project that would include 6 to 8 mgd of purified water (Indirect Potable Reuse or IPR) to Crystal Springs Reservoir followed by a second phase of 4 to 6 mgd of direct potable reuse (DPR) phase that would serve customers on the Peninsula. This quarter, Mid-Peninsula Water District also joined the partnership in preparation for the next phase of work.

Upcoming Activities

Next steps for the project team include completing the Phase 3 feasibility study compliant with Title XVI feasibility and SRF funding requirements. The Project partners are also developing a scope of work for the Basis of Design report and will be initiating a new Memorandum of Agreement (MOA) to share in the cost and responsibilities for future work.

2.1.4 Los Vaqueros Reservoir Expansion

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 (UPDATED)

The LVE Project is a storage project that will enlarge the existing reservoir located in northeastern 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 followed by the formation of the JPA Board has been established and began meeting monthly on November 10, 2021. The JPA will provide governance and administration for the project and JPA members will assist in the design, construction, operation, and administration of the Project.

Meanwhile, CCWD is leading the planning, design and permitting efforts, with funds provided by the State and federal government, and contributions from Local Area Partners (LAPs) 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 a water supply and ensuring 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 conveyance have been the focus for SFPUC staff in determining the extent of participation in the LVE project.

Specifically, to better understand the conveyance options and effects related to decision-making for the LVE Project, two subprojects were developed. The subprojects are listed below and described in the subsequent sections:

1. **Conveyance Alternatives** (evaluating conveyance from LVE to RWS facilities);
2. **The Bay Area Regional Reliability (BARR) Partnership Shared Water Access Program (SWAP)**, which is a simulation to evaluate the potential impacts of conveyance from LVE to San Antonio Reservoir within the RWS, as well as an exchange with ACWD.

In addition, water supply options are being considered for storage in LVE. One of these options is treated in-Delta diversions through the **Brackish Water Desalination Project**, which could be a source of supply as an exchange with CCWD. This project is described separately under the AWS Program.

Current Planning Considerations (UPDATED)

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

- 1) What are the water supply options available to fill storage in Los Vaqueros Reservoir for the SFPUC? What are the opportunities and constraints associated with water supply?
- 2) What are the costs and constraints of 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?

Activities this Quarter

During this quarter, there have been several significant developments in planning, permitting, design, and funding as described below. The updates are grouped in the paragraphs that follow.

Planning, Permitting and Design

A number of permit applications have been submitted to the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife and awaiting comments and approval in this quarter. Coordination continues with the California Division of Safety of Dams on the 90 percent design. The Los Vaqueros Dam Expansion Technical Review team was formed

in this quarter and commenced monthly meetings starting in January 2022. The objective of the meetings is to provide technical updates on project progress and an overview of the dam design.

Evaluation of alternative alignments for the Transfer-Bethany Pipeline through sensitive areas continues in coordination with key local stakeholders. The 30 percent design of the Transfer-Bethany Pipeline Turn-in to the California Aqueduct is under review by the DWR.

Preliminary design of Pumping Plant No. 1 Replacement is complete. Inspections of the Transfer Pipeline are anticipated in Fall 2022. An assessment of options to meet CCWD's water supply and quality objectives during construction of the dam when reservoir releases are not available is ongoing.

State and Federal Funding

Federal funding for the project is expected to provide 25 percent of the total project cost at approximately \$160 million. The FY22 Continuing Resolution that went into effect September 30, 2021 included \$50 million in Federal funding for the Project. This is in addition to the \$14 million that was appropriated in FY21. The LVE Project is also eligible for \$470 million in Proposition 1 funding as part of WSIP through the California Water Commission.

Local Area Partners

Amendment No. 3 to the Multi-party Cost Share Agreement provides funding of up to \$6,279,848 divided equally among the seven Project partners. In this quarter, Local Area Partners and CCWD have started a discussion on potential use of Water Infrastructure Finance and Innovation Act (WIFIA) financing as funding mechanism for the JPA's portion of the LVE capital spending. It's assumed that the LVE Project is eligible to apply for WIFIA credit assistance since the project would prevent, reduce, or mitigate the effects of drought and enhance the resilience of drought-stricken watersheds.

This quarter, the SFPUC and DWR initiated discussion on technical and financial terms and conditions of conveyance for the Los Vaqueros Supply.

Los Vaqueros Reservoir Expansion Joint Powers Authority (JPA)

The newly formed Los Vaqueros Reservoir JPA Board of Directors commenced monthly meetings during this quarter. Three committees were formed at the JPA's December Board meeting to help guide policy and resolve issues related to Finance, Operations and Engineering and Communications and Outreach. The JPA Chair will appoint Directors and Alternates to three committees. The agenda and supporting information for the JPA Board Meetings are available on the JPA website: www.losvaquerosjpa.com.

Upcoming Activities

There are several key milestones projected in the coming months. In the next quarter, staff expect the following activities to take place:

- Continue identification and preliminary characterization of water supply options
- Clean Energy Capital, an LVE financial consultant, in collaboration with CCWD's engineering team and the LVE Financial Work Group, will further study eligibility as well as a Cost Benefits analysis that compares WIFIA to generation of revenue bonds. If WIFIA is approved by the JPA Board, a Letter of Interest will be submitted to the U.S. Environmental Protection Agency (EPA) in Spring 2022.

2.1.4.A *Conveyance Alternatives*

Project Background

The SFPUC is considering two main pathways to move 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 EBMUD.

The SBA is a 49-mile aqueduct, which is part of the State Water Project, owned by DWR. There are three State Water Project contractors (SBA Contractors) who maintain contract capacity for use of the SBA. They are 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

Significant advances have been made to evaluate potential water quality impacts of bringing new water supplies through the SBA into San Antonio Reservoir or the Sunol Valley Water Treatment Plant through the Bay Area Regional Reliability Shared Water Access Program (BARR SWAP) effort described in the next section.

Once there is confidence in treatability and available conveyance capacity through the SBA, SFPUC, through the JPA will enter into agreements with DWR regarding the terms and conditions for SBA use.

In addition to direct deliveries to SFPUC facilities, SFPUC staff are also pursuing exchanges with SBA Contractors. ACWD is a Wholesale Customer and the SFPUC shares common customers with Valley Water, including 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 in the subsequent update.

Upcoming Activities

In the coming quarter, an assessment of infrastructure that once connected the SBA to San Antonio Reservoir – during the drought of 1990s - will be initiated. A draft term sheet will also be developed that outlines the constraints and condition of physical capacity and an estimate for SBA usage fees.

2.1.4.B Bay Area Regional Reliability Shared Water Access Program (BARR SWAP)

Project Background (UPDATED)

As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, EBMUD, Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.

The BARR agencies initially proposed two separate pilot projects through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot transfers will be completed in 2022. This work is supported with grant funds from the U.S. Bureau of Reclamation and the participating water agencies.

The first proposed pilot (Pilot 1A) is a desktop simulation that assumes the existence of some facilities that are currently not in place. The second pilot (Pilot 2A) was a physical exchange of water between two federal Central Valley Project (CVP) Contractors, CCWD and Valley Water. Due to drought conditions, a third pilot testing CVP transfers between CCWD and EBMUD was added to the BARR SWAP effort.

Current Planning Considerations

This simulation will test the conveyance of water from an expanded Los Vaqueros Reservoir through the SBA. The agencies participating in this simulation are the SFPUC, ACWD, and BAWSCA. This BARR SWAP project will help the SFPUC evaluate two aspects of LVE Project feasibility:

- 1) Potential water quality impacts and treatment needs associated with a new water supply through the SBA into San Antonio Reservoir and Sunol Valley Water Treatment Plant; and
- 2) Potential for exchange with ACWD, offsetting demand on the RWS.

Activities this Quarter

In this quarter, for Pilot 1A, a final report which includes the technical memoranda on the impacts of bringing in a new source of supply from the LVE Project through the SBA and blending that supply with the RWS either in San Antonio Reservoir or directly at the Sunol Valley Water Treatment Plant (Sunol WTP) was prepared. This will feed into the BARR SWAP analysis.

A Draft BARR SWAP strategy report is being prepared by all the Partners and the consultant team.

Upcoming Activities

In the next quarter, the BARR SWAP report will continue to be the focus of the BARR Partners. As the draft report is prepared, planning for a meeting with stakeholders will also commence.

2.1.5 Bay Area Brackish Water Desalination

Project Background

The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, EBMUD, SFPUC, Valley Water, and Zone 7 Water Agency. 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. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering a water supply benefit of between 5 and 15 mgd during dry year conditions when combined with storage at LVE.

Current Planning Considerations

In the current planning, SFPUC is considering brackish water desalination as a source for storage in LVE. For that scenario, 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. An initial screening of technically feasible alternatives was carried out during this reporting period.

Upcoming Activities

Additional analysis of feasible alternatives will be initiated in the next quarter.

2.1.6 Calaveras Reservoir Expansion

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 (UPDATED)

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 continued to develop and evaluate conveyance alternatives.

Upcoming Activities

In the next quarter, a draft report will be prepared to summarize the conveyance evaluation.

2.2 Upcountry Projects

2.2.1 Groundwater Banking

Project Background

Groundwater banking in the Modesto Irrigation District (MID) 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 provide net water supply benefits in dry years by sharing responsibility for instream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish 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.

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 WSIP, 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 can offset future retail demands 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. Ongoing efforts are described in [Section 3.5.1](#).

2.3.1 San Francisco Purified Water

Project Background

The San Francisco Purified Water Project is a concept that envisions providing a new, local drinking water supply in San Francisco. In 2020, the SFPUC successfully completed PureWaterSF, a small-scale research and demonstration DPR project at its headquarters. While much more research and investigation are needed before a project is developed, there is a statewide push to increase reuse and reduce wastewater discharges. With the absence of large remaining non-potable applications and the lack of infrastructure in San Francisco to support other types of potable reuse, San Francisco is evaluating treated water augmentation in which purified water could be blended at one or more of San Francisco's drinking water reservoirs.

Activities this Quarter

This quarter, the consultant team identified and began evaluating 4 scenarios to maximize the potential purified water opportunities in San Francisco. Treatment needs were identified, and planning for a sustained outreach strategy was initiated.

Upcoming Activities

Analysis of the four conceptual alternatives identified will be ongoing in the coming quarter. The consultant team will also prepare a draft layout based on treatment needs.

2.3.2 Satellite Recycled Water

Project Background

The proposed Satellite Recycled Water Project would provide a tertiary recycled water supply to meet the demands of dual-plumbed⁴ buildings in San Francisco that do not currently have a non-potable water supply source. This project would provide an appropriate water supply source for non-potable irrigation, as well as commercial and industrial uses not addressed by the Non-Potable Ordinance (NPO).

⁴ 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.

Activities this Quarter

In this quarter, SFPUC's staff and consultants began developing the final technical memo summarizing the results from the satellite treatment facility feasibility study. The consultant team prepared a report evaluating the cost of acquiring a site that could accommodate a potential recycled water plant. The draft report also considered land acquisition strategies and evaluated the availability and cost of land in the future. The report concluded that due to the limited geographic area for which the site can be located, land acquisition that meets the site requirements for a satellite recycled water plant will be highly challenging. It also concluded the targeted geographic area is highly developed with limited potential for undeveloped sites that can be readily acquired thus likely necessitating a parcel assemblage strategy that will entail additional time and cost. The report concluded it would an average of ~\$73 million to acquire the necessary land.

Upcoming Activities

The consultant team will continue to develop the technical memorandum and infrastructure requirements for a potential recycled water treatment facility at Southeast Plant.

2.3.3 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 NPO apply to new, large development projects in San Francisco. The SFPUC is also 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 worked with the contractor and project partners to develop signage to improve communication and outreach about the project and SFPUC's innovative leadership.

The SFPUC continues to use several technologies and approaches to detect potential leaks in its system. This includes an ongoing pilot of the Ecologics 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.

2.4 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.

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

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 San Francisco Regional Water System (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.

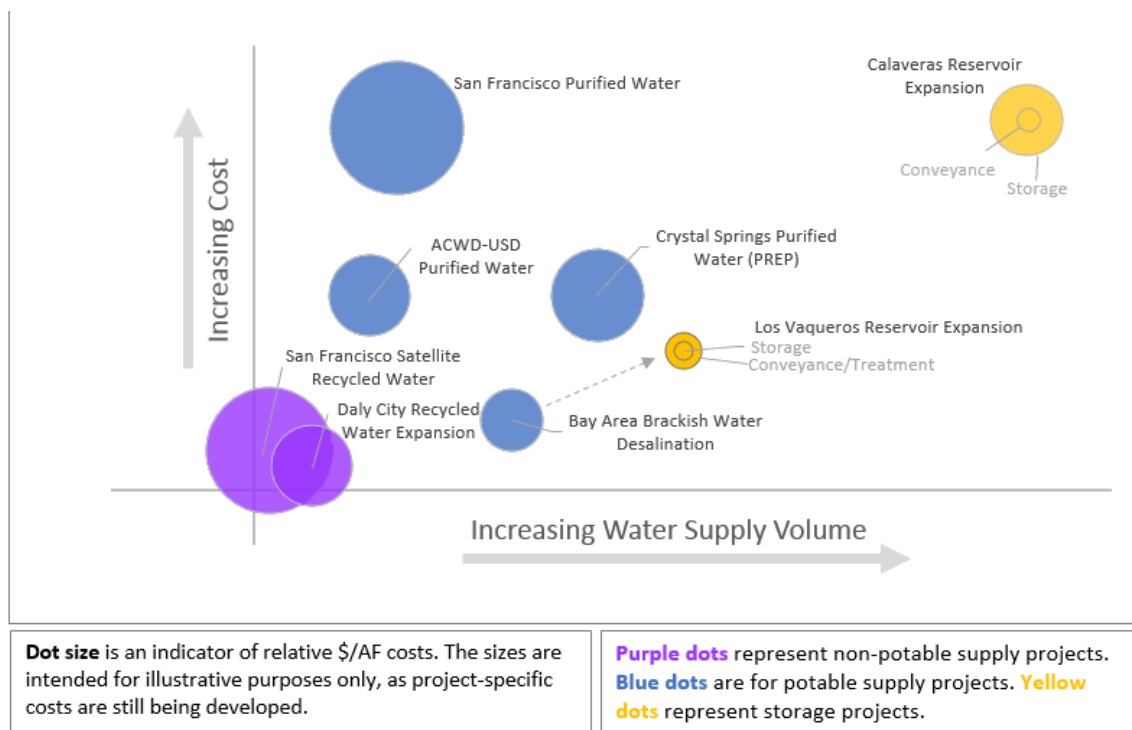
The AWS Program includes four regional water supply projects, two regional storage expansion projects, and two local water supply projects in San Francisco. In addition to regional and local water supply projects, the AWS Program includes evaluating and supporting existing infrastructure and pursuing complementary infrastructure options to meet future water supply needs. Included in this category are one evaluation of conveyance to deliver new supplies, one simulation of a transfer that can provide insight into the feasibility of a new water supply and exchange opportunities, and one project to explore new ways of increasing supply or offsetting demand increases in San Francisco. Studies are underway to evaluate all these projects. Finally, there are also three additional water supply projects that would require partnerships with Irrigation Districts on the Tuolumne and/or Stanislaus Rivers (referred to here as upcountry projects). These projects may be analyzed in the coming months, in conjunction with negotiation efforts with the State on the Bay Delta Water Quality Control Plan (Bay-Delta Plan). The upcountry projects are described in these quarterly reports, and more information will be provided on their development as it becomes available.

The SFPUC is still in the early stages of planning and significant uncertainties about cost, volume and timing of supply availability remain. However, 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 needs are 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 4** below. Purple dots represent non-potable supply projects, blue dots represent potable supply projects, and yellow dots represent storage projects.

Figure 4. Relative Volume and Cost of Alternative Water Supply Projects



3.3 Planning Needs, Priorities and Service Objectives

The need to pursue the various alternative water supply options stems from the significant water supply needs that the SFPUC faces within the planning horizon and because traditional supplies are increasingly limited. While these needs will continue to evolve over time, our

adaptive planning approach is focused on being able to explore and plan a diverse set of water supply options to meet needs when they arise while continuing to provide reliable and sustainable water supply to all our retail and wholesale customers.

Among the water supply needs before the SFPUC, the most significant is represented 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. SFPUC staff determined that the impact of this new flow requirement in the Tuolumne River would be a reduction in available water supplies by approximately 93 mgd during dry years at the current contract levels of demand.

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. 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 new water supply opportunities that provide dry year reliability so that we can continue to meet our highest priority needs and our LOS Goals and Objectives.

In our planning framework, water supply needs will be met in the order of priority. These planning priorities, which were first articulated for the Commission in August 2016, have been slightly modified over time and are expressed as follows:

1. Offset instream flow needs and meet regulatory requirements (*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 how well we can achieve our LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key LOS Goals and Objectives relevant to this effort 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)

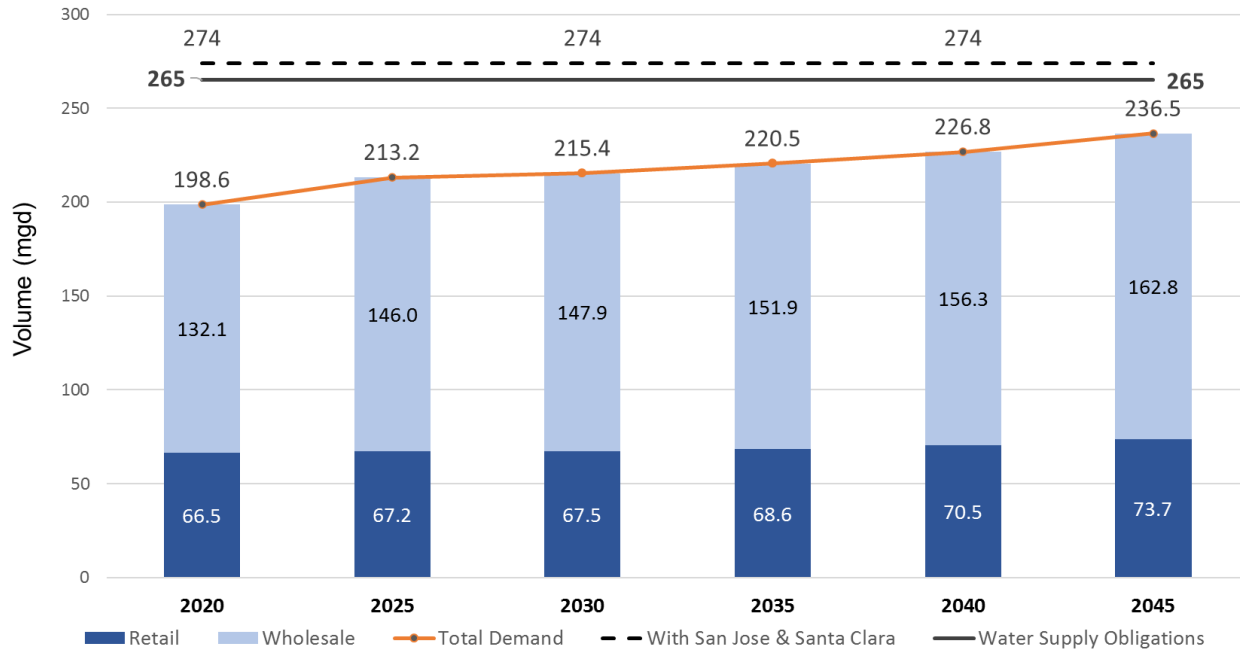
Together, the planning priorities and LOS Goals and Objectives provide a lens through which we consider the water supply options and opportunities as we strive to meet all our foreseeable water supply needs.

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.

On the demand front, the SFPUC has contractual obligations to provide 184 mgd (Supply Assurance) to Wholesale Customers. Similarly, the SFPUC provides 81 mgd to retail customers. Together, this represents 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 2028 on whether to provide this new supply assurance. For planning purposes, the AWS Program includes 9 mgd for San Jose and Santa Clara, enabling the Commission to make this commitment in the future. **Figure 5** below shows the current and potential future obligations, as well as demand projections consistent with the SFPUC's 2020 Urban Water Management Plan.

Figure 5. SFPUC’s Water Supply Obligations and Projected Demands



Meanwhile, other uncertainties remain on the supply side of the equation. Based on the SFPUC’s system modeling, the Regional Water System would be able to deliver 257 mgd in 2045 under planned drought conditions and current water supply policies, including rationing. Implementation of the Bay Delta Water Quality Control Plan (Bay-Delta Plan), as adopted, would reduce supply availability during droughts by 93 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. These supply-side uncertainties can also trigger the exploration of new water supplies.

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 is developing 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 meet delivery needs. 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 meeting water supply needs that are evaluated based on the contractual obligations, projected demands, and the available supplies. 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 needs under different planning scenarios.

	Obligations (mgd)		Available Water Supply (mgd)		Water Supply Needs (mgd)
	Planning for Obligations (2045) Drought Year	Obligations for Permanent Wholesale Customers, Anticipated Obligations for Interruptible Customers, and Retail Allocation	274	Water supply available with no new instream flow requirements	257
			Water Supply available with implementation of the Bay-Delta Plan and rationing	152	122
	Demands (mgd)		Available Water Supply (mgd)		
	Planning for Demands (2045) Drought Year	Projected Demands in the Retail and Wholesale Service Areas accounting for conservation, and offsets from onsite water recycling and non-SFPUC System supplies	236.4	Water supply available with no new instream flow requirements	257
Water Supply available with implementation of the Bay-Delta Plan and rationing				152	84

As shown in the matrix, the water demands account for the demand offsets or the reduction resulting from conserving water and implementation of onsite water recycling programs in San Francisco. The SFPUC provides comprehensive water conservation program services open to all residents and businesses in San Francisco by way of the following programs:

- The Innovations Program (described in Section 2) promotes exploration of new ways to conserve and reuse water, recover resources, and diversify water supplies.
- The Local Water Program provides conservation assistance, promotes recycled water to meet San Francisco’s most significant irrigation needs, mandates non-potable supplies for toilet flushing and irrigation in new developments and develops local groundwater to enhance the City’s drinking water supply sustainably now and into the future.
- The 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. Under the Non-potable Ordinance (NPO), onsite water reuse systems are required for new, large development projects in San Francisco. Recently amended in

2021, Article 12C of the San Francisco Health Code, the NPO requires new development projects of 100,000 gross square feet or more to install and operate an onsite water reuse system.

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. Although not a core part of AWS planning, the demand offsets are accounted for and updated as part of AWS Planning. Recent demand offsets are estimated at 1.9 mgd, i.e., an equivalent reduction in the retail demands.

With the adoption of the Bay-Delta Plan in 2018, the AWS team is proceeding with the assumption that it would be implemented. Although the flow volume may change with the Voluntary Agreement negotiations, the current water supply need to meet obligations is estimated to be 122 mgd. Under the same flow scenario, the water supply needed to meet projected demands is estimated to be 84 mgd.

With the central objective of meeting water supply needs, the planning approach for the AWS Program allows for a process that understands the range of estimated needs and supply availability in the context of uncertainties. It thus informs the different decisions from identifying and conceptualizing projects, planning them, to implementing or advancing them forward.

3.4 Making San Jose and Santa Clara Permanent Customers

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 (WSA) 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 would like 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 2045 water supply needs for the AWS Program account 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 WSA, as amended, 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 meet anticipated dry year needs and help the SFPUC Commission make a policy decision regarding permanent status for San Jose and Santa Clara by 2028.

3.5 New Alternative Water Supplies

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 needs require that we consider alternative water supplies and creative and sustainable new solutions within the planning horizon to remain resilient and fully meet our needs. In addition to the opportunities identified, SFPUC staff are also continuing to seek more options. The new 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 we have it so that it can be available when we need it most (dry years). The amount of water storage we can use 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 our distribution system. The Calaveras Reservoir Expansion Project and the Los Vaqueros Reservoir Expansion (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 (GSR) 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. We are continuing to pursue all feasible opportunities.

Purified Water (Potable Reuse) (~10-25 mgd). Potable reuse is the 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 can be compared 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 (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. As we pursue these projects, SFPUC staff continue to look for design and technology solutions for intermittent or scalable use.

Desalination (~5-15 mgd). The Brackish Water Desalination Project could provide 5-15 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. East Bay Municipal Utility District (EBMUD) and ACWD may also participate in the project. Like potable reuse projects, a regional desalination project would likely need to be operated year-round to maintain the integrity of the treatment systems unless scalable design or technology solutions are identified. However, developed in conjunction with the LVE Project, this project could be used to provide greater dry year supply reliability.

3.5.1 Water Supply Programs not included in the AWS Program

In 2008, the SFPUC Commission adopted the Phased Water Supply Improvement Program (WSIP), a variant of the proposed WSIP 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, we share best practices and coordinate 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 WSIP were being planned well before the new water supply needs of 84 mgd to 122 mgd were identified; therefore, they do not count toward meeting the current water supply needs that are the focus of the AWS Program.

3.6 Planning for Implementation

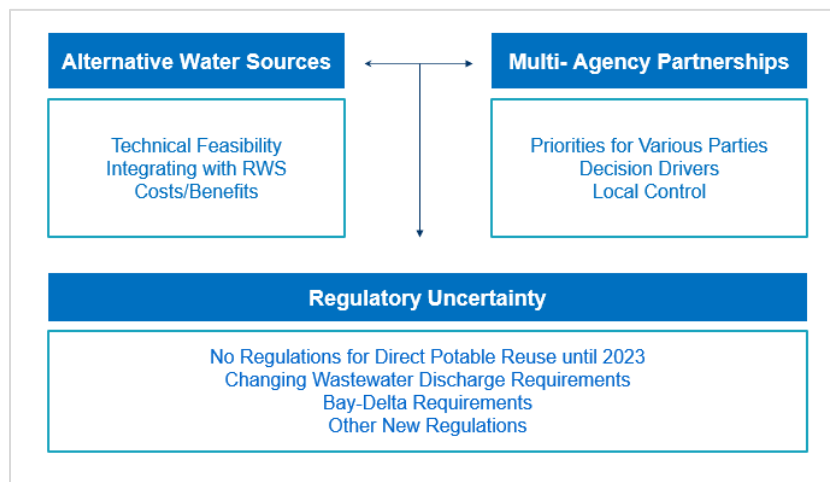
If all the projects identified through the SFPUC’s current AWS planning process to date could be implemented, there would still be a supply shortfall to meet dry year demands with San Jose and Santa Clara all-year water supply needs included. Furthermore, each of the supply options being considered has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

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or our 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 gaps. 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 regional⁵ 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 our 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 6**).

Figure 6. 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

⁵ Outside the SFPUC’s retail service area.

surface water augmentation, it has yet to pass regulations concerning direct potable reuse (DPR). Without clear regulatory guidance, projects with DPR components are at risk due to uncertainties concerning water quality criteria, treatment technologies, and overall feasibility.

3.8 Timeframe ***(UPDATED)***

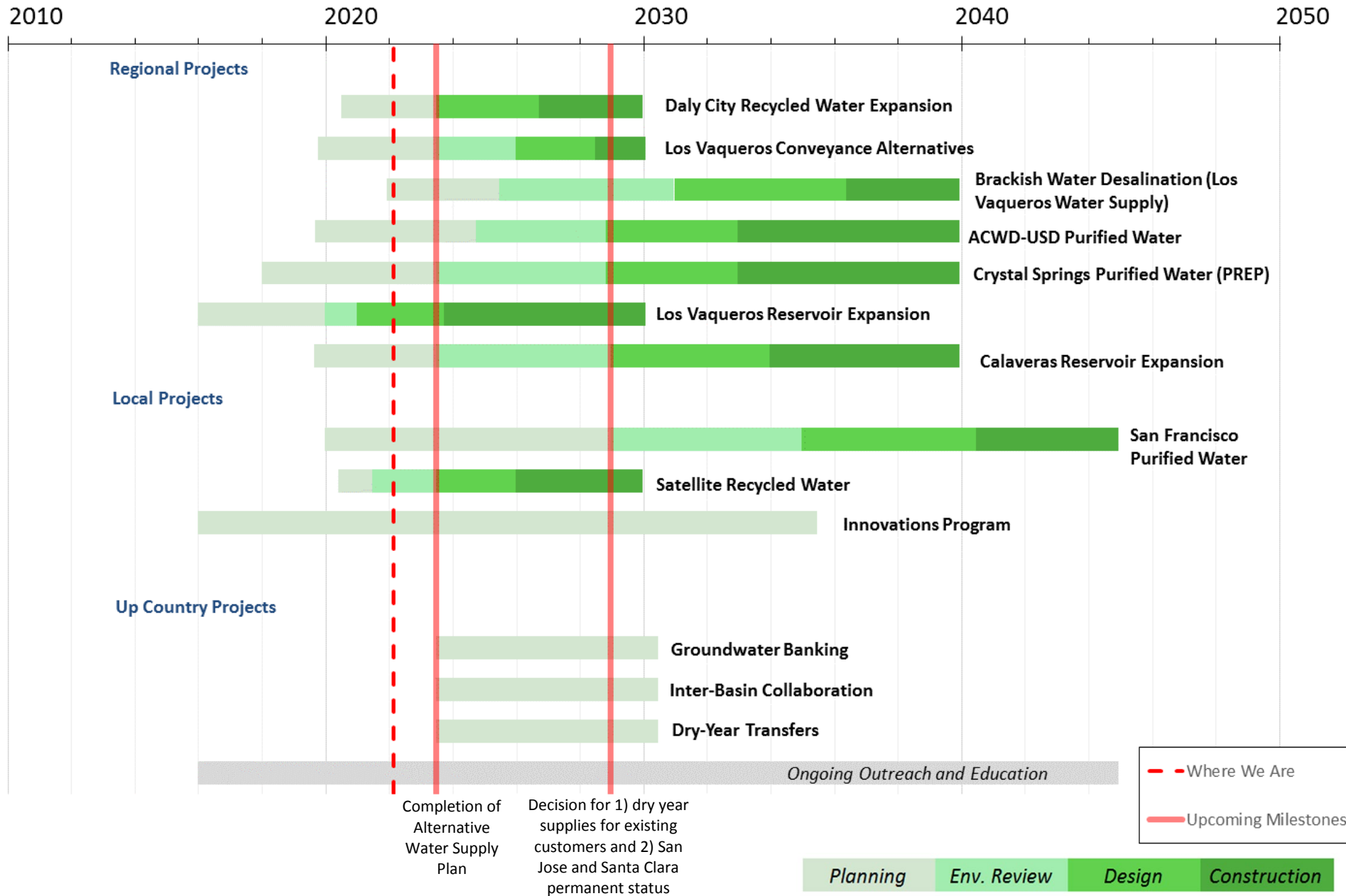
Planning is progressing for the proposed Alternative Water Supply projects. Given the level of complexity and uncertainty, project implementation is expected to take between 10 and 30 years. As planning continues, the timing of water supply needs will be taken into account such as implementation of Bay-Delta 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 these alternative water supply 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 percent 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 (LVE) 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 or before 2023.

A high-level schedule overview of each alternative water supply 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 **(UPDATED)**

In order to advance the planning for several of these Alternative Water Supply 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 planning and 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 our ability to operate and integrate these new supplies into our existing water supply network. This goal is even more challenging when the new water supplies are from very different sources than our existing surface water and groundwater supplies.

To advance these Alternative Water Supply 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 to anticipate long-term risks and challenges and address 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)**

As of February 2022, the SFPUC's 10-year CIP budget includes \$404 million for the planning and implementation of regional AWS projects. This includes full implementation anticipated for the Daly City Recycled Water Project and the LVE Project. Of this budget, \$48 million has been appropriated for planning and design activities.

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 Alternative Water Supply program, as needed to meet planning objectives. These vehicles 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. We anticipate utilizing additional professional services support to advance planning efforts.

3.13 Adapting to an Uncertain Future

The AWS Program is intended to identify, screen and plan for new alternative water opportunities that can help meet the SFPUC's foreseeable water supply needs 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.