Photo: Pulgas Water Temple, 2003

Alternative Water Supply Program Quarterly Report

June 2021

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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 members of the public on the status of regional and local water supply and storage 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 March and May of 2021**. 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 Highlights*, there is **contextual information related to how the water supply estimates are generated for the various AWS projects**. This update provides a description of how the water supply estimates are calculated and how they continue to be refined as feasibility analyses continue. The second thematic discussion focuses on the **costs and value of AWS projects and how they may be thought of differently from past SFPUC water supply projects**. This topic helps provide a lens with which the SFPUC can understand the types of costs that will likely be associated with future water supply investments and how we plan to address them.

For this quarter's *Ongoing Program Activities* updates, the report summarizes activities related to **continued coordination with San Jose and Santa Clara**. This topic continues to be a standing item in our quarterly reports because it describes how planning for these customers relates to the broader dry year supply planning. A second topic in this section is the discussion of **new opportunities under consideration for AWS inclusion.** This update provides preliminary information on new concepts that staff are exploring for potential inclusion in the AWS Program.

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 3-5 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 water supply projects that will meet future water supply needs in the San Francisco Public Utilities Commission (SFPUC) service area. This Program looks beyond the traditional surface water supplies of the Regional Water System (RWS) and local groundwater sources and considers "alternative" water supply options such as expanding surface water storage, groundwater banking, transfers, purified water (potable reuse), desalination and technological innovations and other tools that can increase supply or reduce demand.

The central planning considerations of the program are to meet the following current water supply needs:

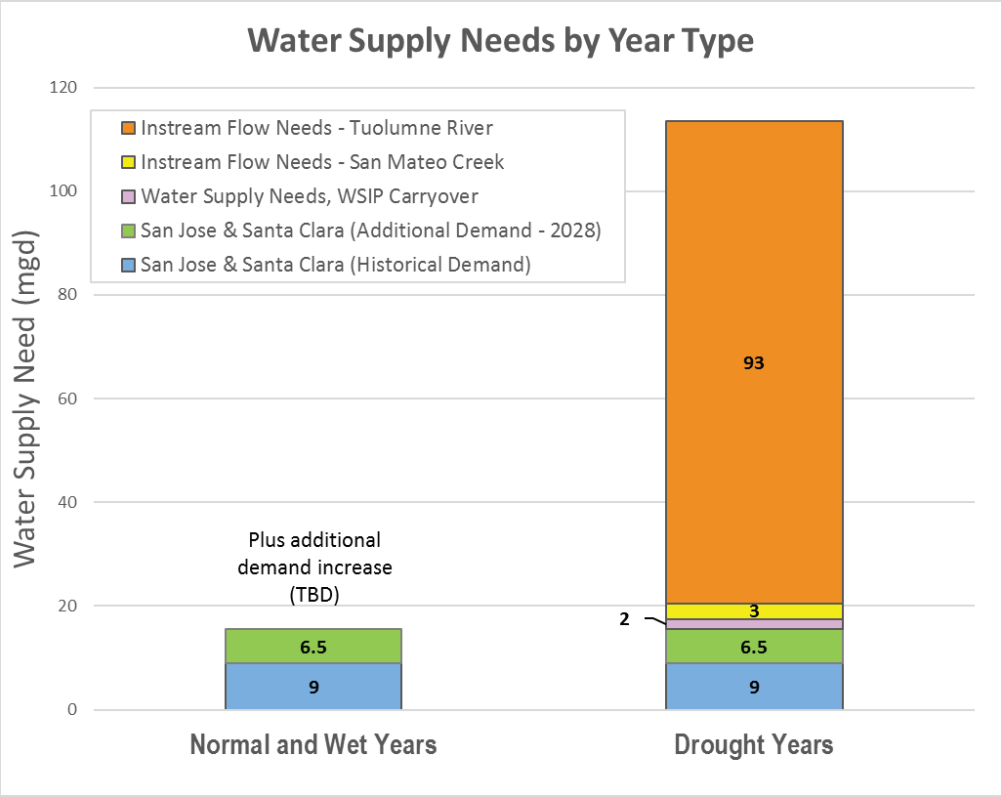
1. Up to 98 million gallons per day (mgd) in drought years (to meet current needs for existing customers and offsetting commitments to the environment); and

2. Between 9 and 15.5 mgd in all years (9 mgd is the minimum to make San Jose and Santa Clara permanent customers of the SFPUC).

Planning for and implementing alternative water supplies requires a comprehensive and detailed planning effort that considers a number of interrelated planning challenges, which are different than those faced for traditional water supply planning at the SFPUC. These planning challenges may include new governing regulations, multi-party partnerships, and approaches for integrating supplies into an existing water system, among other issues. And, as with any long-term water supply planning effort, the SFPUC must also contend with future uncertainties such as instream flow needs and other regulatory changes, demand projections and climate change. These planning challenges and uncertainties highlight the importance of being proactive and strategic in our planning efforts for the AWS Program. Strategic planning allows us to be flexible as the SFPUC continues to gain clarity over time around issues at both a programmatic level (i.e. drivers that will refine future water supply needs) and at a project level (i.e. regulatory developments, water rights issues, and other technical considerations). Proactive planning ensures that the SFPUC has thoroughly examined the water supply options available ahead of the need so that we can continue to provide a safe and reliable water supply for our 2.8 million customers.

The AWS Program's anticipated water supply needs in both normal years and drought years are shown in **Figure 1** for the planning horizon. The water supply needs are described by each type of need that the AWS Program is considering.

Figure 1. Current Anticipated Water Supply Needs in the Planning Horizon



1.2 Quarterly Highlights

1.2.1 Evolution of Water Supply Potential through AWS Planning

While many of the projects in the AWS Program had been identified in prior years as potential water supply options, more detailed analyses of a majority of the projects now under review began *after* the State's adoption of the Bay Delta Water Quality Control Plan (Bay-Delta Plan) in December 2018. Early estimates of maximum potential supply associated with the projects in the AWS Program were expressed as ranges based on preliminary information about the nature and location of the various AWS projects. Among them, the largest volumes of potential supply were associated with expanded storage (20-30 mgd), purified water (10-25 mgd), and desalination (5-15 mgd).

With planning studies for regional projects currently underway, additional factors that affect the accounting of the water supply associated with AWS projects have become clearer. These include:

- *Type of project* – Whether it's a storage project, a water reuse project, a potable offset, or conveyance alternative, different types of water supply projects have a very different effect on water supply availability and need to be calculated differently to be comparable. For example, a storage project may provide a large volume that is delivered across multiple dry years, while a purified water project may produce water every year.
- *Project constraints* – Planning studies help identify specific project constraints that affect water supply benefit of a given project. Examples include permit limitations or assumptions about conveyance and evaporative losses that may be expected.
- *Allocations between project partners* – Changing needs and agreements between project partners will determine how water allocations may be shared.
- *Integration of new alternative supplies* – Supplies produced by a project may not match the water supply benefit ultimately realized by the SFPUC. For example, the timing and location of water supplies available from a project and how those new supplies are integrated into our existing system operations in normal/wet years verses dry years can affect how much of the supply provides an incremental benefit to the SFPUC. For example, a purified water project would produce water every year, including in years where there is no identified need for additional supply.

Table 1 on the next page summarizes recent changes in planning estimates for regional projects in the AWS Program.

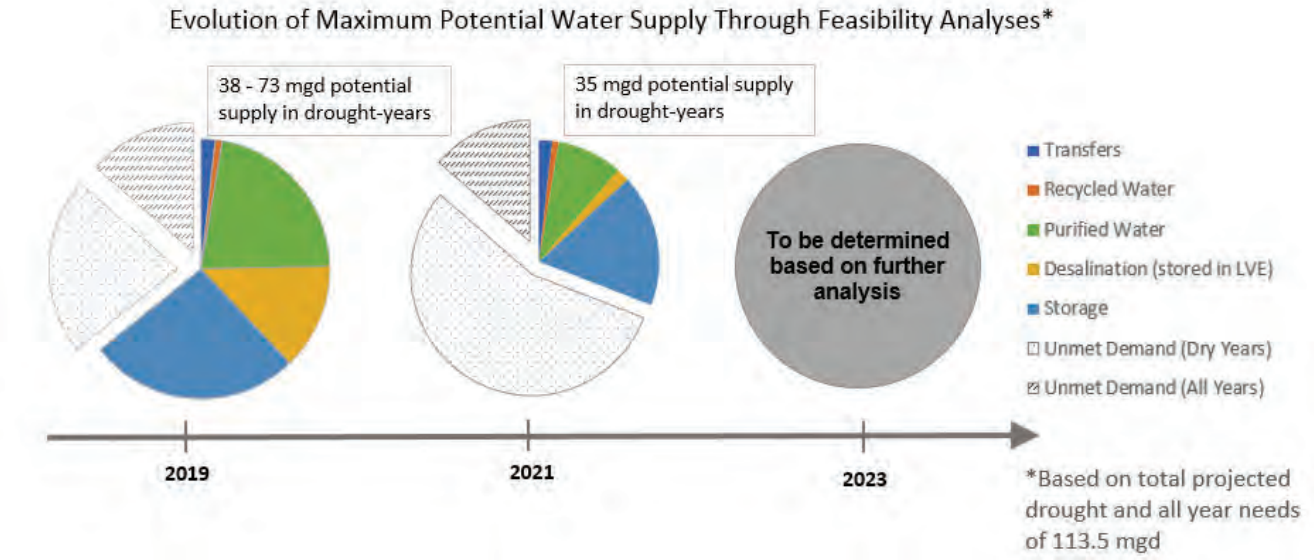
Table 1. Evolution of Regional Planning Estimates in the AWS Program

	Preliminary Estimate of Project Water Supply (MGD)	*Current Estimate of Water Supply Available to SFPUC (MGD)*	*Basis for Estimate Revisions*
TRANSFERS (2 mgd)			
Dry Year Transfers Districts	2	2	
RECYCLED WATER (1 mgd)			
Daly City Recycled Water Expansion	1.25	0.7	1.25 average annual delivery of recycled water results in 0.7 mgd of additional water available in the groundwater basin, based on preliminary modeling
PURIFIED WATER (10-25 mgd)			
ACWD/USD Purified Water	4 – 13	5	The current assumption is that up to 9 mgd can be treated initially; there are also losses during treatment processing, aquifer storage and conveyance
Crystal Springs Purified Water	6 - 12	5	Water supply benefits will be allocated among partners; losses have not been calculated; water produced in wet and normal years has no additive water supply benefit to the RWS
DESALINATION (STORED IN LOS VAQUEROS EXPANSION) (5-15 mgd)			
Bay Area Brackish Water Desalination	5 - 15	2*	Based on water rights and exchange potential, 10 mgd is a likely project size; that supply would be divided among partners; conveyance and evaporation losses occur in storage
STORAGE (20-30 mgd)			
Los Vaqueros Expansion	0	0	Included in the calculation for Bay Area Brackish Water Desalination
Calaveras Expansion	20 - 30	20	Some evaporative and conveyance losses likely (not yet analyzed)
TOTAL	**38 - 73**	**35**	

*SFPUC estimates water supply from Brackish Water Desalination to be approximately 3-5 mgd. However, transmission and evaporative losses through storage in Los Vaqueros Reservoir are likely to reduce available supply.

A companion to the details presented in Table 1, **Figure 2** illustrates the evolution of planning estimates as new project information continues to be made available through analysis in the AWS project feasibility studies. As shown in the figure, the estimate of water supply available to the SFPUC may be further refined between now and June 2023 when the AWS Plan is completed.

Figure 2. Evolution of Maximum Potential Water Supply Through Feasibility Analyses



Section 2 of this report provides regular updates on analysis for each project in the AWS Program. It is preliminary information from those ongoing analyses that have resulted in updated water supply planning estimates. Some takeaways that are reflected in these changes and may impact ongoing updates include:

1. As groundwater basin, reservoir and systemwide modeling is conducted, SFPUC staff will continue to be able to refine our understanding of water supply availability in a drought. Initial modeling has been done only for the Daly City Recycled Water and Los Vaqueros Reservoir Expansion projects. Project-specific data is being gathered for additional modeling for all AWS projects.

2. As discussed in previous quarterly reports, the majority of the AWS projects involve complex partnerships. Partnership projects will require negotiations on cost and water supply allocations that will affect the SFPUC's share of water supply benefits. As planning continues, we are able to better understand potential allocation scenarios to update estimates, but detailed negotiations, and the resulting allocations, will not occur until after feasibility analyses are completed.

3. Depending on the source, location, conveyance pathway and storage assumptions, losses may vary and affect how much water supply is available for delivery. For purified water, desalination, and storage projects, these details are not yet fully known.

4. Water rights, permit conditions, and local treatment and distribution infrastructure may further constrain water supply availability even when production and storage are available. These factors will continue to be identified in the course of planning.

Feasibility studies are still underway and AWS projects have not yet been modeled alongside the RWS operations and assumptions. Staff also continue to identify and explore additional opportunities including local, regional and upcountry projects. As planning analyses continue between now and June 2023, SFPUC staff will regularly update water supply benefit estimates and share them periodically through this Quarterly Report.

1.2.2 Valuing AWS Multi-Party Projects Differently from Traditional RWS Projects

Historically, the SFPUC has invested largely in infrastructure that it has owned and operated. The large, complex networks of reservoirs, treatment plants, pump stations, and transmission and distribution systems are operated and maintained by SFPUC staff across seven counties. Capital investments and planning have emphasized the cost of building or enhancing assets rather than the ongoing expenditure needed to continue to operate and maintain them.

With the regional projects being considered under the AWS Program, all but one involve multi-party partnerships with other water and wastewater utilities, often outside of our immediate service area. While regional collaboration will be increasingly necessary to more efficiently distribute limited regional water supplies, it will require that the SFPUC think about costs and value differently than it has in the past. Long-term contracts with reservoir owners or water and wastewater purveyors may have higher Operations & Maintenance (O&M) costs over time for assets that the SFPUC will likely not own.

How we value the water supply and reliability benefits associated with AWS projects will drive how SFPUC and our partners make investment decisions and how contracts and cost share arrangements among parties are structured. Willingness to pay for reliability during droughts may outweigh control of infrastructure.

As we consider how multi-party regional partnerships influence the allocation of costs, staff will work with a financial consultant to help develop a framework to evaluate AWS project costs in the coming year. AWS Program staff are currently working with the SFPUC Finance team to identify financial modeling needs to support program evaluation.

1.3 Ongoing Program Activity Updates

1.3.1 Status on Ongoing Coordination with San Jose and Santa Clara

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 obligations and meet existing 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.

Activities in this Quarter

SFPUC staff had two meetings with San Jose and Santa Clara during this quarter, in March and May. In response to an interest by San Jose and Santa Clara to identify new opportunities to work together directly, staff discussed several possibilities ranging from new water supply to transfers. The SFPUC continues to collaborate and separately evaluate possible project concepts that can maximize the potential for regional dry year benefit in addition to providing a permanent water supply source to meet the needs of San Jose and Santa Clara.

1.3.2 New Opportunities Under Consideration

As outlined in this report, impending water supply needs over the planning horizon are significant and the potential water supply benefits associated with the projects being considered through the AWS Program continue to evolve as technical and institutional analyses are conducted. Therefore, AWS Program staff continue to seek out new opportunities for consideration and possible inclusion in the AWS Program.

Activities in this Quarter

Valley Water approached the SFPUC about potential partnership in the expansion of Pacheco Reservoir, a surface storage reservoir in southeast Santa Clara County. The expansion would potentially enlarge the reservoir from 6,000 acre-feet to 141,600 acre-feet. This Project was awarded early grant funding of $24.2 million by the California Water Commission through the

Proposition 1 Water Storage Investment Program, with conditional award eligibility of approximately $497 million.

Like the Los Vaqueros Reservoir Expansion Project, this Project offers the potential for dry year water supply storage but is not hydraulically connected to the SFPUC's Regional Water System. During this quarter, staff from Valley Water and SFPUC discussed options for transfers, exchanges, and conveyance. Staff will continue to draft modeling scenarios and test the initial viability of the concept before determining whether to include it for formal review in the AWS Program.

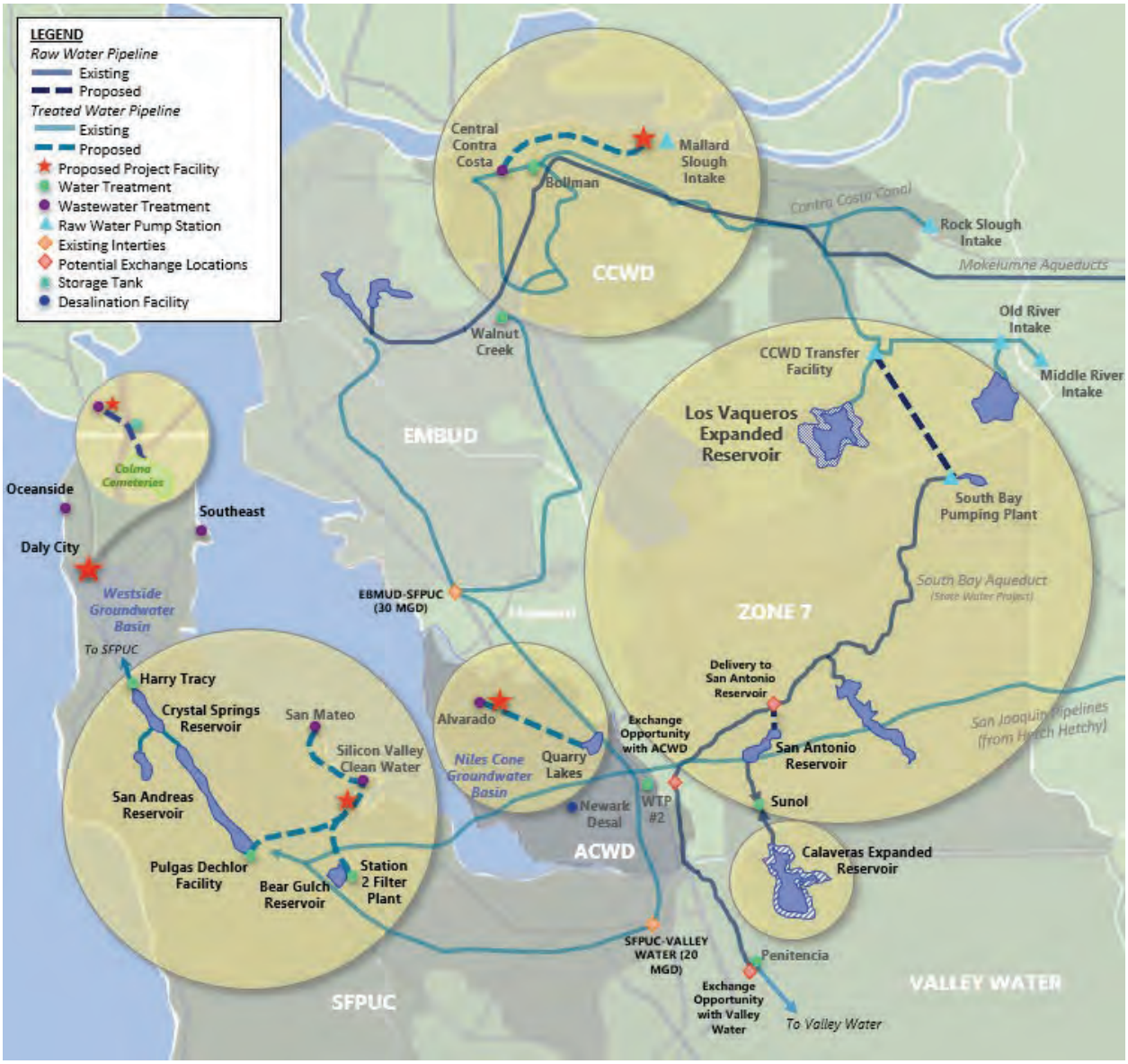
In addition to the expansion of Pacheco Reservoir, SFPUC continues to seek new projects that may provide additional water savings or water supply benefits. Working with San Jose and Santa Clara, other regional utilities, and studying the potential for reuse in San Francisco are all ways in which new project concepts are being identified to address our long-term water supply needs.

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 are 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

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
(updated June 2021)
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
The current planning questions driving near-term project activities include:

1) Are there alternatives to the baseline recycled water project that might help mitigate project risks associated with the GSR project and increase dry year reliability in the South Westside Basin?

2) How can the project be phased to maximize benefits over time?

3) How will responsibilities and costs be allocated among the project partners?

Activities this Quarter
SFPUC staff have continued to meet monthly with Cal Water and Daly City to discuss project updates and key project tasks and goals related to the planning questions above. Each agency is assessing potential project benefits as a factor in contributing to project cost. Cal Water is continuing to evaluate its potential investment in the context of other regional projects.

For the analysis of feasible project alternatives, SFPUC staff and the consultant team have screened and narrowed down the range from six to three options that would be carried forward for detailed analysis. Two alternatives include recycled water delivery to offset groundwater pumping and one envisions a small purified water project to store water directly in the groundwater basin (indirect potable reuse). Criteria used to screen the alternatives included review of water supply benefits, operational complexities, and implementation risks. Staff also modeled the Basin under various conditions, identifying the relative benefits to the Basin. Further analysis of the three alternatives will include evaluation of treatment requirements, siting, and cost estimates. During this quarter, SFPUC staff have also reached out to some of the cemeteries regarding potential storage tank siting, future water supply demands and their existing infrastructure.

Upcoming Activities

In the coming quarter, SFPUC and its consultant team will complete the detailed analysis of the three alternatives. SFPUC staff will continue to work on fully accounting for project costs as well as defining project benefits to determine project impact on water supply, future rates, and cost sharing with partner agencies.

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 a range of potentially feasible alternatives for treatment and delivery?

3) 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 defined the alternatives that would be carried forward for detailed analysis. The alternatives 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. The two alternatives will result in the analysis of different treatment requirements. During this quarter, ACWD also conducted a preliminary review of site options for an advanced purification facility.

Upcoming Activities

In the coming quarter, that the consultant team will further develop and analyze the two selected alternatives.

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

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 is the preferred operational scenario for the project?

2) How will a new water supply in Crystal Springs Reservoir affect water quality and operational needs of the RWS?

3) What are the feasible alternatives to delivery through Crystal Springs Reservoir? How do the costs and benefits of the alternatives compare?

To answer these questions, the SFPUC and partner agencies including BAWSCA, Cal Water, Redwood City, SVCW and San Mateo developed a scope of work for Phase 3 of the feasibility study.

Activities This Quarter

This quarter, the SFPUC, partner agencies and the consultant team continued to make progress on the Phase 3 feasibility study by outlining the different purified water (indirect and direct potable reuse) alternatives that would be analyzed. The project team has also defined the modeling parameters that will be used to evaluate the impacts of different alternatives on Crystal Springs Reservoir and integration with the RWS.

Upcoming Activities

Next steps for the project team include refining modeling inputs based on feedback from the project team and continuing analysis of feasible alternatives.

2.1.4 Los Vaqueros Reservoir Expansion

Project Partners & Interests

CCWD **EBMUD**	**ACWD** **Zone 7 Water Agency** **Valley Water**	**SFPUC** with BAWSCA
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 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 CCWD, the expansion will have regional benefits and will be managed by a JPA that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the EIS/EIR and approved the LVE Project on May 13, 2020.

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 to support this project. These are listed here 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

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

1) Is conveyance through the South Bay Aqueduct a feasible alternative to deliver water either directly, or via exchange, to the SFPUC? If so, under what conditions?

2) Are there feasible alternatives to conveyance through the South Bay Aqueduct for the SFPUC?

3) What are the water supply options that are available to fill storage in Los Vaqueros Reservoir for the SFPUC? What are the opportunities and constraints associated with water supply?

Activities this Quarter

During this quarter, there have been several significant developments. The updates are grouped in the paragraphs that follow.

Planning and Permitting

The LVE Project permitting activities continue to advance with funds from the Amendment No. 2 to the Multi-Party Cost Share Agreement.

Formation of a Joint Powers Authority (JPA)

The legal work group with representatives from all project partners continues to work on the JPA agreement. SFPUC representation on the legal work group is through the City Attorney's Office, in close cooperation with SFPUC staff. During this quarter, the legal work group continued to negotiate terms and provisions of the draft JPA such as voting, funding, staffing and withdrawal provisions. JPA formation is expected to be finalized in the summer of 2021.

Usage Fees

The LVE Project includes the use of underlying facilities owned by CCWD and EBMUD. Each of these agencies is proposing to assess facility use charges, or usage fees, to recoup proportionate costs of 1) operating and maintaining those facilities and 2) repair and replacement related to the original capital investment.

In this quarter, while not finalized, CCWD memorialized the usage fees negotiations to date in a Letter of Intent which was signed by participating agencies. EBMUD presented a revised usage fees memorandum for review by Project partners in April.

A *pro forma* financial model that was developed for the LVE Project in 2019 was updated with the latest assumptions on CCWD and EBMUD usage fees and the projected long-term average flows through each Project facility. The *pro forma* was presented in two cost workshops in March and again in late April. Using the LVE *pro forma*, SFPUC staff are working with the Project team to analyze costs in 3 types of years: years when the SFPUC will fill LVE storage, years when water is stored and held, and years when the SFPUC will take deliveries from the LVE Project.

Upcoming Activities

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

- Updated storage and usage cost allocations
- JPA formation
- Identification and preliminary characterization of water supply options
- SFPUC staff recommendation on conveyance and storage

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

In August 2020, SBA Contractors shared a model to demonstrate available capacity in the SBA under various hydrologic conditions based on their projected demands in 2040. This model has been the primary tool in calculating future spare capacity of the SBA, which can be made available to the SFPUC for receiving deliveries from LVE.

In this quarter, in addition to utilizing the model, the SFPUC and BAWSCA staff analyzed 40 years of actual SBA flow data as an additional reference point and to better understand the daily operation of the SBA. The SFPUC will take this information into account for timing of deliveries from the LVE.

Meanwhile, through the Bay Area Regional Reliability Shared Water Access Program (BARR SWAP) effort described in the next section, the SFPUC is continuing 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. 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.

As an alternative to use of the SBA, the SFPUC is also evaluating conveyance pathways through EBMUD. EBMUD and the SFPUC share an emergency intertie through the City of Hayward, however this alternative considers the development of a new non-emergency intertie. The SFPUC retained a consultant team to evaluate three potential alignments for conveyance. Based on preliminary analysis, this new conveyance alternative will not likely be cost competitive with use of the SBA, which is an existing pipeline.

Upcoming Activities
In the coming quarter, evaluation of both conveyance alternatives is expected to be complete.

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

Project Background
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 are proposing two separate pilot projects in 2020-2021 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 and will be completed in 2021. 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) will be a desktop simulation that assumes the existence of some facilities that are currently not in place.

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, 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) were further investigated.

The project team analyzed 30 years of historical water quality data from SBA, San Antonio Reservoir, and Sunol WTP, the facility that would treat the blended supply in the future. The data included in the study is from 1990-2020, which includes the two most recent drought periods of 1990-92 and 2011-2016. Analysis shows that chloride and bromide are the parameters of primary concern, in particular during a drought when the water quality in the SBA decreases.

A new water supply source also has the potential to introduce new species into the San Antonio reservoir and to the RWS. The water quality analysis shows that there may be several new species introduced to San Antonio Reservoir as a result of bringing in Delta water through the SBA that have the potential for becoming invasive. The alternative of bringing water directly from the SBA to Sunol WTP was also considered and could mitigate the impact of invasive species. However, the diurnal and seasonal variability of water supply through the SBA could present significant operational challenges. Therefore, this alternative is not viable.

In addition to identifying the water quality concerns, SFPUC staff plan to learn more about monitoring actions and protocols that other agencies who regularly use the SBA water have in place. To do so, in collaboration with the consultant team, the SFPUC developed a short utility survey to collect Best Management Practices on monitoring and response protocols for aquatic invasive species. This survey was shared with the three SBA contractors, ACWD, Zone 7 Water Agency, and Valley Water. Staff will compile this reference data in the coming quarter.

Upcoming Activities

In the next quarter, the project team will complete the water quality and treatability analysis and will continue to make progress in evaluating the potential financial implications and necessary institutional agreements needed to enable exchanges with ACWD and Valley Water.

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

Staff have previously identified some water rights issues associated with exchanges needed to store water from this project in LVE. A decision was made to wait until a planned pilot exchange of Central Valley Project water between Valley Water and CCWD is completed. That pilot is ongoing and may be delayed due to current drought conditions, so no additional work has resumed for this project.

Upcoming Activities

Next steps will depend on the outcome of the planned Central Valley Project exchange.

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
The current planning questions include:

1) What are feasible dam raise scenarios for the physical storage structure and what are some preliminary cost estimates?

2) What are the conveyance alternatives, including infrastructure and operational considerations, for an expanded Calaveras Reservoir?

3) How can different water supply alternatives be integrated to maximize efficient use of expanded storage at Calaveras?

Activities this Quarter
During this quarter, a new consultant was retained to evaluate alternatives to bring water from upcountry to Calaveras Dam. A kick-off meeting was held on May 12, 2021.

Upcoming Activities
The project team will continue to identify and evaluate project alternatives.

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 in-stream 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

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 is needed before a project is conceptualized, 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 would have to consider treated water augmentation in which purified water could be blended at one or more of San Francisco's drinking water reservoirs.

Activities this Quarter

In this quarter, staff have finalized a Task Order to study the potential for purified water on a citywide basis. This task will include analysis of the maximum potential for purified water (direct potable reuse) based on a review of available source water, existing infrastructure and regulatory guidance. The study will also lay out next steps for project planning and public engagement.

Upcoming Activities

A Task Order to study purified water opportunities and develop a stepwise approach for planning will begin in the next quarter, and likely be completed in early 2022.

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-plumbed[1] 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).

[1] 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 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 staff and the consultant team continue to work on identifying potential sites for a satellite treatment facility on the eastside of San Francisco to serve existing dual-plumbed buildings. SFPUC Real Estate Division is assisting with the search for a potential site in the Mission Bay or Financial District. The team has also begun to analyze the option of producing recycled water at Southeast Treatment Plant. The team is defining the water quality goals for this option.

Upcoming Activities
Evaluation of a satellite treatment facility will continue in the next quarter.

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. The SFPUC is also pursuing a prospective project to expand leak detection and a project to test atmospheric water generation technology.

Activities this Quarter
SFPUC staff are finalizing the sole source contract with SOURCE (formerly Zero Mass Water) for the atmospheric water generation project. SFPUC is providing a grant through the Onsite Water Reuse Grant Program to brewery process water reuse project. The brewery process water reuse project has completed construction in May. 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.

2.3.4 Potable Offset Potential

Project Background
(updated June 2021)
San Francisco has active programs that offset potable water demand. These include water conservation mandates and incentives, mandatory onsite water recycling, and recycled water for large irrigation uses. In addition, the Non-Potable Ordinance in San Francisco is currently

being amended to further offset demand associated with new developments. The purpose of this project was to explore the potential to do even more by surveying relevant programs locally and globally and determine whether a new water neutral ordinance would be beneficial in San Francisco. The SFPUC examined elements of various programs and associated potable water thresholds that could result in policy recommendations.

Activities this Quarter

SFPUC staff and a consultant team completed the study describing the potential for a water neutral ordinance in San Francisco. The study summarized relevant programs implemented globally that could be applied in San Francisco. Review of these programs demonstrated that many of the successful elements were already incorporated through San Francisco's existing programs and ordinances such as high fixture saturation rates for toilets, showerheads, and faucets throughout the City. The study concluded that there is very limited incremental benefit beyond San Francisco's existing and effective programs. Additional measures would be difficult to implemented and costly and are not recommended at this time. However, the SFPUC continues to explore new ways to conserve and reuse water, recover resources, and diversify the City's water supply through the expansion of existing ordinances, and Conservation and Innovations Programs.

Upcoming Activities

Exploration of Potable Offset Potential Study is now complete. Therefore, this activity will no longer be reported on in future AWS quarterly reports. Opportunities for greater water use efficiency will continue to be reported as they are identified through the Innovations and Conservation programs.

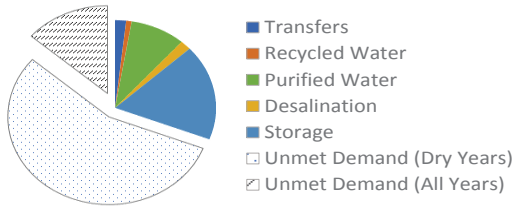
2.4 Project Summaries

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 prepares to meet demands through the 2045 water supply planning horizon, there is a need to look beyond the traditional surface water supplies of the San Francisco Regional Water System (RWS) and local groundwater sources. The 15 projects under evaluation represent the non-traditional or "alternative" water supply options that we are considering such as expanding storage, groundwater banking, transfers, purified water (potable reuse), desalination, and technological innovations that can increase supply. The need to pursue these 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 strategy is focused on being able to meet needs when they arise while continuing to provide reliable and sustainable water supply to our retail and wholesale customers.



Potential New Alternative Water Supply Options

General Program Information

Average Annual Supply	Availability
Varies	Varies

SFPUC Budget Information

	10-Yr CIP Budget Allocation	Current FY '21 Allocation
Regional	$288M	$17M
Local	$10.3M	$6.3M

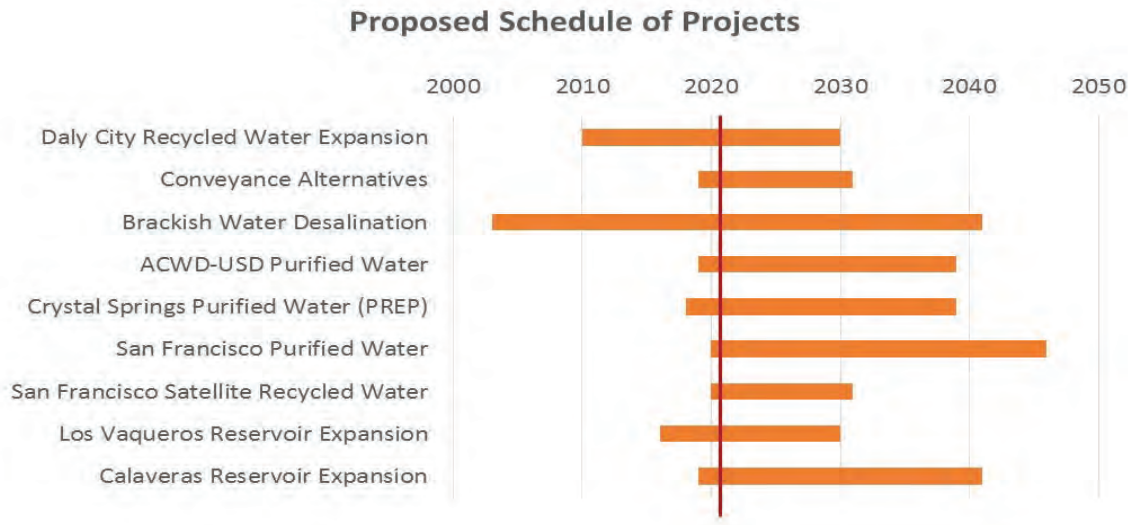
Total Project Costs

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

Capital Cost/Acre-Foot

TBD

Programmatic Schedule



Current Status	Risks and Uncertainties	Benefits
Planning	• Determining inceremental water supply benefits • Integrating new supplies with existing supplies	• Potential to meet future water supply needs

18-Month Outlook

• Feasibility studies underway to identify and analyze project concepts

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

SFPUC Budget Information

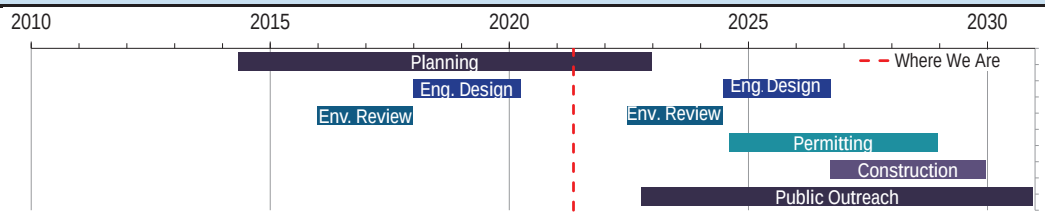
10-Yr CIP Budget Allocation:	$85.0M	**Current Allocation:**	$2.5M

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

Planning

18-Month Outlook

- Identify Project ownership and cost structure among Partners (SFPUC, Daly City, Cal Water)
- Evaluate project alternatives
- Develop Term Sheet for project
- Outreach and communication with cemeteries and Colma

Risks and Uncertainties

- 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

Benefits

- 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

SFPUC Budget Information

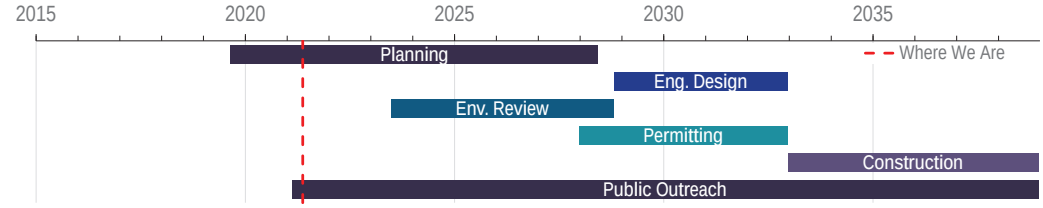
10-Yr CIP Budget Allocation:	$5.0M	**Current Allocation:**	$2.5M

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

Planning

18-Month Outlook

- Develop and analyze the two selected alternatives

Risks and Uncertainties

- Uncertainty of planned capital improvements at wastewater treatment plant may affect purified water treatment requirements
- Potential water quality change to Quarry Lakes

Benefits

- Leverages existing facilities to provide water supply

Crystal Springs Purified Water

Project Description

This is a purified water project that could provide 6-12 mgd of water supply through reservoir water augmentation at Crystal Springs Reservoir in San Mateo County, within the SFPUC's Regional Water System (RWS). Treated wastewater from Silicon Valley Clean Water and/or the City of San Mateo would go through a water purification process that uses multi-barrier treatment technology to meet state and federal drinking water quality standards. The purified water would then be transmitted 10-20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Treatment Plant. In addition to the SFPUC and the wastewater agencies, Cal Water, Redwood City and BAWSCA are also participating in the project. Initial feasibility analyses have been completed. Additional planning, including analysis of feasible operational scenarios, impacts to RWS operations, and the evaluation of Direct Potable Reuse (DPR) alternatives, are needed to further evaluate the feasibility and impacts of this project.

Crystal Springs Reservoir

Project Partners

Silicon Valley Clean Water, City of San Mateo, Cal Water, Redwood City, 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

SFPUC Budget Information

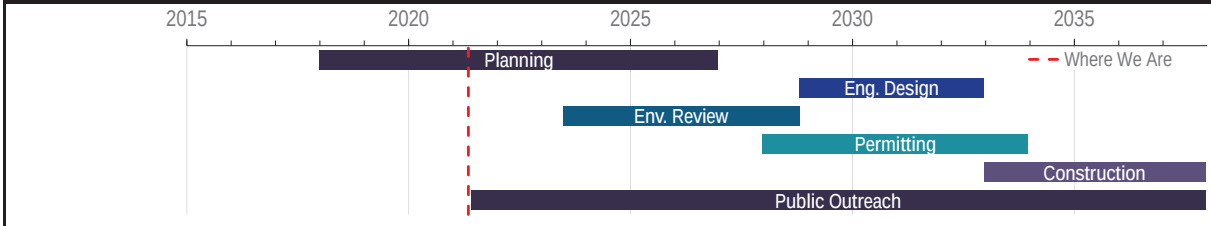
10-Yr CIP Budget Allocation:	$4.5M	**Current Allocation:**	$2.0M

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

Planning

18-Month Outlook

- Continue analysis of impacts of new water supply into Crystal Springs Reservoir
- Perform modeling analysis
- Refine model inputs

Risks and Uncertainties

- 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

Benefits

- Reduces Bay discharges
- Provides a new drought-resistant water supply

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 northeastern 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 will be set up prior to construction. 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 facilites 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

Est. Capital Cost:	$980M	**Est. Annual O&M:**	TBD

SFPUC Budget Information

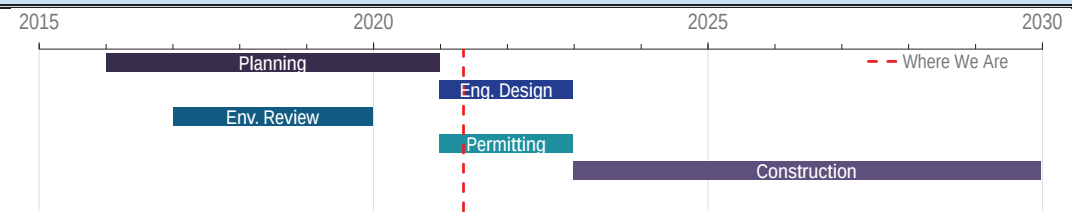
10-Yr CIP Budget Allocation:	$10.5M	**Current Allocation:**	$2.5M

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

Planning; Environmental Review

18-Month Outlook

- Updated storage and usage cost allocations
- JPA formation
- Identification and preliminary characterization of water supply options
- Staff recommendations on conveyance and storage

Risks and Uncertainties

- Capacity and institutional constraints for conveyance to RWS
- Firm water supply source
- Depending on conveyance option, water quality and need for pretreatment

Benefits

- Provides operational flexibility, particularly in drier years
- Allows the SFPUC to manage existing supply more efficiently

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).

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).

South Bay Aqueduct

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

SFPUC Budget Information

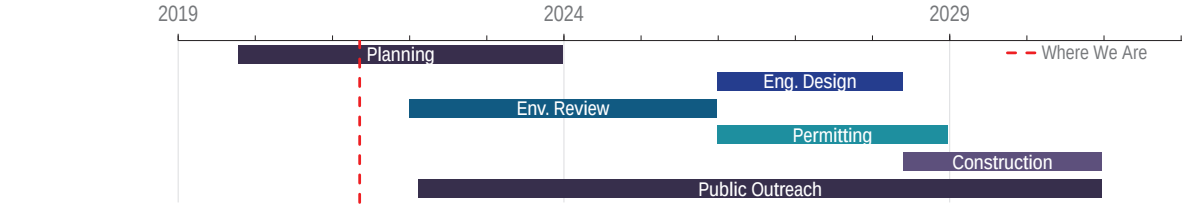
10-Yr CIP Budget Allocation:	$3.0M	**Current Allocation:**	$2.0M

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

Planning

18-Month Outlook

- Complete memos for both conveyance alternatives

Risks and Uncertainties

- Institutional arrangements / willingness of stakeholders
- Availability of supply
- Availability of SBA capacity

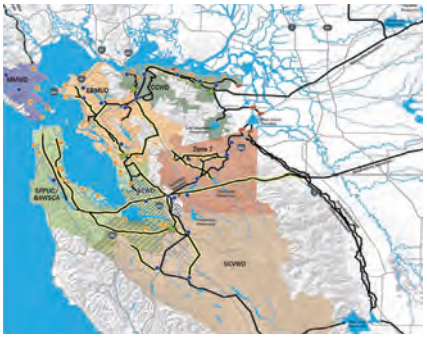
Benefits

- Leverages existing infrastructure

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

Project Description

In 2016, eight of the Bay Area's largest water utilities formed a partnership to explore opportunities to transfer and exchange water across service areas to better serve customers, particularly in times of droughts and emergencies. The partnership is intended to leverage the existing infrastructure and interconnections that exist between the partnering agencies. The Bay Area Regional Reliability (BARR) Partnership includes the following agencies: 1) Alameda County Water District (ACWD), 2) Bay Area Water Supply & Conservation Agency (BAWSCA), 3) Contra Costa Water District (CCWD), 4) East Bay Municipal Utility District (EBMUD), 5) Marin Municipal Water District (MMWD), 6) the San Francisco Public Utilities Commission (SFPUC), 7) Valley Water (formerly Santa Clara Valley Water District and 8) Zone 7 Water Agency.



BARR Service Areas

The BARR Partnership has received two grants from the US Bureau of Reclamation to support for collaborative drought planning. A Drought Contingency Plan was completed in 2017. Currently, the BARR Partnership is planning to test water transfer scenarios through a Shared Water Access Program (SWAP) so that future transfers can be implemented more readily in times of drought or emergency. The SFPUC is participating in a water transfer simulation with ACWD and BAWSCA that would simulate the use of the South Bay Aqueduct (SBA) for an exchange with ACWD and a transfer into San Antonio Reservoir.

Project Partners

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

SFPUC Project Manager

Manisha Kothari

General Project Information

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

Total Project Cost

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

SFPUC Budget Information

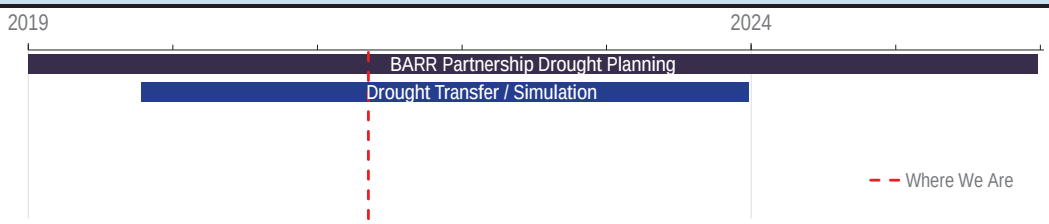
CIP Budget Allocation:	$0.3M	

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

Conceptual

18-Month Outlook

- Conduct water transfer simulation through SBA, considering operational, water quality, financial and legal impacts
- Review water quality and treatability analysis
- Evaluate financial implications and exchange agreements

Risks and Uncertainties

- Institutional arrangements / willingness of stakeholders

Benefits

- Encourages regional water supply planning and collaboration
- Leverages existing infrastructure

Bay Area Brackish Water Desalination (Regional Desalination)

Project Description

The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between Contra Costa Water District (CCWD), SFPUC, Valley Water, and Zone 7 Water Agency. East Bay Municipal Utility District (EBMUD) and the Alameda County Water District (ACWD) may also participate. The project could provide 10-20 mgd of 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 new infrastructure needed for this project includes a treatment facility and upgrades to existing facilities. Zone 7 Water Agency would likely need a new intertie with EBMUD. Depending on the conveyance system used, additional pretreatment and/or facility upgrades may be needed.

Bay Delta Wetland

Early planning studies conducted between 2003-2015 assumed that the project would provide a steady water supply of 9 mgd to the SFPUC in all years; however, the SFPUC is currently seeking drought year supply via storage in Los Vaqueros Reservoir from this project. The final volume share will be subject to negotiation with other partners. The SFPUC would not directly receive desalinated water, but would take delivery of water through a series of transfers and exchanges.

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

SFPUC Budget Information

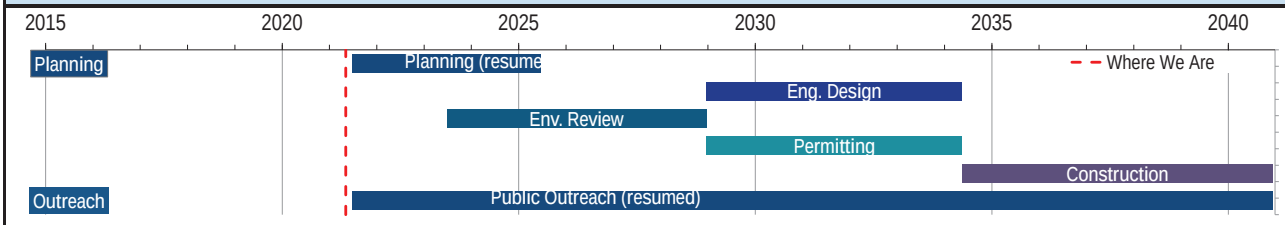
10-Yr CIP Budget Allocation:	$5.0M	**Current Allocation:**	$1.5M

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

Planning

18-Month Outlook

- Project paused until a planned pilot exchange is completed.
- Determine next steps based on outcome of planned Central Valley Project exchange.

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

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

SFPUC Budget Information

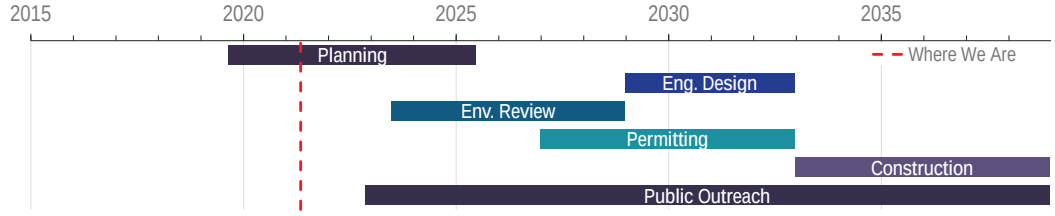
10-Yr CIP Budget Allocation:	$3.5M	**Current Allocation:**	$2.5M

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

Planning

18-Month Outlook

- Consultant team identifying and evaluating conveyance alternatives

Risks and Uncertainties

- Availability of additional water from the Tuolumne River to divert to storage

Benefits

- 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.

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

Irrigation in MID service area

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 and Michael Carlin

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

SFPUC Budget Information

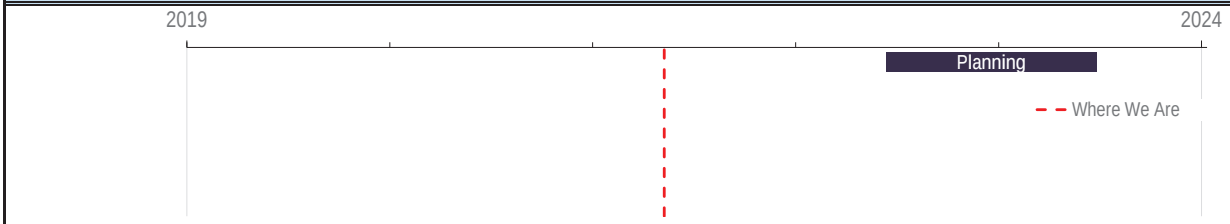
CIP Budget Allocation:	$0.0M	

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

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 provide net water supply benefits in dry years by sharing responsibility for in-stream 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. 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 and Michael Carlin

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

Est. Capital Cost:	TBD	**Est. Annual O&M:**	TBD

SFPUC Budget Information

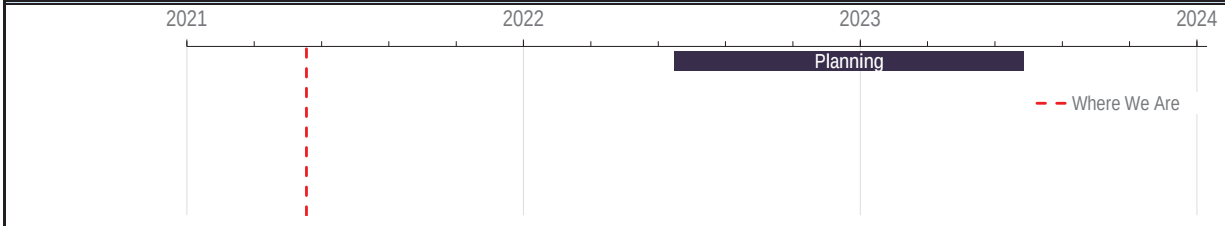
CIP Budget Allocation:	N/A	

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

Conceptual

18-Month Outlook

• Meeting with other parties to be scheduled pursuant to Voluntary Agreement negotiations

Risks and Uncertainties

• Collaboration will require agreements and operational changes among many public and private parties

Benefits

• Better management of basins can lead to greater regional water supply availability
• Water supply and environmental benefits

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 agremeent to transfer 2 mgd from Modesto Irrigation District (MID) in drought years. However, the negotations 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 and Michael Carlin

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

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

SFPUC Budget Information

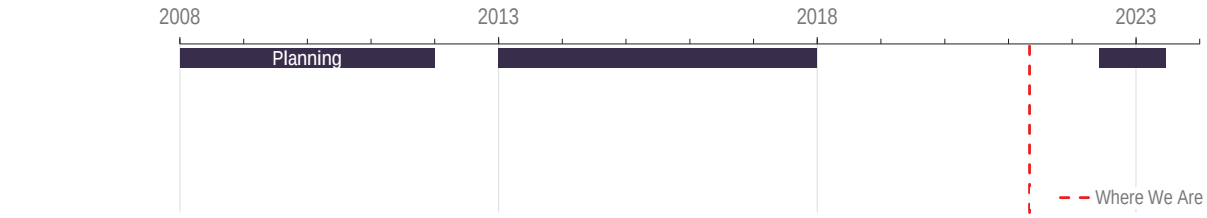
CIP Budget Allocation:	TBD	

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

Conceptual

18-Month Outlook

- Resume discussions with Districts

Risks and Uncertainties

- Institutional arrangements / willingness of stakeholders
- Availability of supply

Benefits

- Leverages existing supply and existing infrastructure

San Francisco Purified Water

Project Description

The San Francisco Purified Water Project is a concept that envisions providing approximately 5 million gallons per day of new, local drinking water supply in San Francisco. The project would treat secondary effluent sourced from one of San Francisco's 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

Before engaging in project planning, SFPUC conducted inital research and testing around water quality, process reliability, and operational needs for purified water opportunities. Initial outreach with staff and local communities was also carried out. This 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 will be conducted to identify potential size, scale and other next steps. Additional, larger-scale research, testing, training and outreach is also anticipated.

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
5 mgd	All Years	Purified Water	Local	TBD

Total Project Cost

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

SFPUC Budget Information

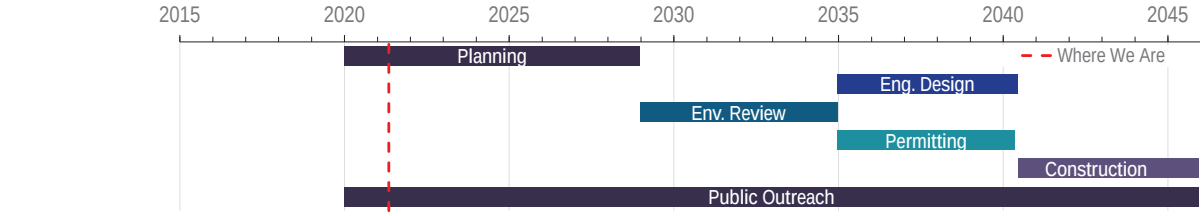
10-Yr CIP Budget Allocation:	$5.5M	Current Allocation:	$0.5M

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

Research / Conceptual

18-Month Outlook

- Study purified water opportunities
- Develop a stepwise approach for planning

Risks and Uncertainties

- Regulatory framework not in place until after 2023
- Need for additional testing, analysis and study
- Public perception

Benefits

- Reduces Bay discharges
- Takes advantage of treated recycled water availability

Satellite Recycled Water

Project Description

The proposed Satellite Recycled Water Project would provide a tertiary recycled water supply to meet the demands of dual plumbed buildings in San Francisco that do not currently have a non-potable water supply source. Based on prior surveys, there is likely less than 0.5 mgd of demand for existing buildings that have the ability to use non-potable water, but lack the supply. This project would include a small centralized tertiary treatment facility, storage tank, and transmission lines that would be located nearest to a majority of the end uses. This project would provide an appropriate water supply source for non-potable irrigation, as well as commerial and industrial uses not addressed by the Non-Potable Ordinance (NPO).

Rendering of Chase Center in San Francisco

Project Partners

SFPUC only

SFPUC Project Manager

Taylor Chang

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
Up to 0.5 mgd	All Years	Recycled Water	Local	TBD

Total Project Cost

Est. Capital Cost:	TBD	**Est. Annual O&M:**	TBD

SFPUC Budget Information

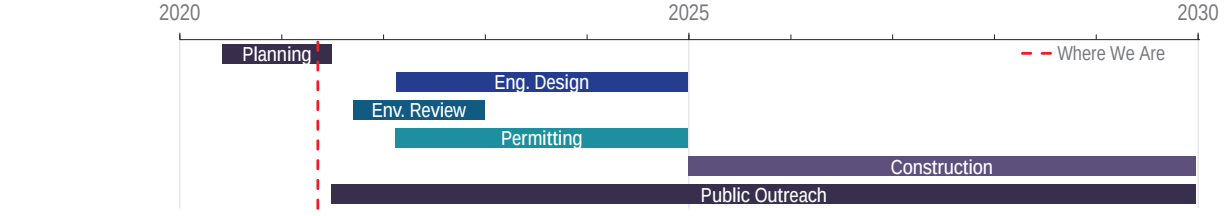
10-Yr CIP Budget Allocation:	$4.8M	**Current Allocation:**	$0.8M

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

Conceptual

18-Month Outlook

- Carry out feasibility study including alternatives analysis

Risks and Uncertainties

- High cost relative to customer potential
- Land availability
- Complexity of serving dispersed customers
- Potential for cross-connections

Benefits

- Bridges gap not met by Non Potable Ordinance (NPO) for non-potable needs
- Reduces Bay discharges
- Potential for potable offset
- Matches right water for right use

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 Project 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

SFPUC Budget Information

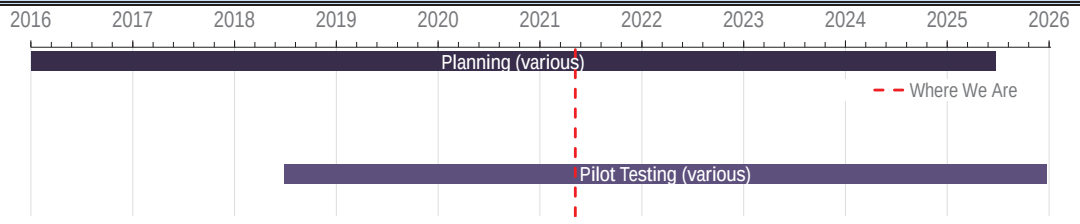
CIP Budget Allocation:	$0.5M	

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

Planning; Pilot Testing

18-Month Outlook

- Continue developing projects to demonstrate potential for water savings and supply

Risks and Uncertainties

- Individual projects may be small, making them costly

Benefits

- Identifies new technology opportunities to increase efficiency and water availability

Potable Offset Potential

Project Description

The purpose of this project is to evaluate the potential to offset the incremental water demand associated with large new developments in San Francisco. Through coordination with other City departments such as Planning and the Department of Building Inspection, the SFPUC reviewed options and potable water thressholds that could result in policy recommendations. The first step in the planning process is to survey proposed developments to determine the volume and characteristics of incremental demand that are not already being offset by the Non-Potable Ordinance or other existing requirements. This is a local demand-side management measure that aims to limit the need for additional water supplies in San Francisco.

San Francisco Skyline Looking Past Bay Bridge

Project Partners

SFPUC and other City departments

SFPUC Project Manager

Taylor Chang

General Project Information

Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
Unknown	All Years	Non-Potable Water / Potable Offset	Local	N/A

Total Project Cost

Est. Capital Cost:	Not yet known	Est. Annual O&M:	None

SFPUC Budget Information

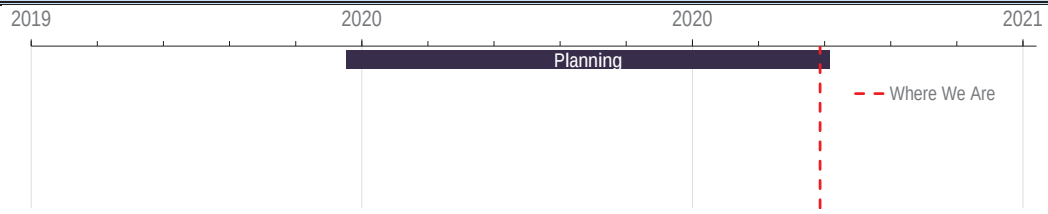
CIP Budget Allocation:	$0.03M	

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.

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning

18-Month Outlook

Project is now complete

Risks and Uncertainties

- Cost to developers and/or property owners of implementation

Benefits

- Limits or eliminates demand from new developments

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. Sections include 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 prepares to meet demands through the 2045 water supply planning horizon, there is a need to look beyond the traditional surface water supplies of the San Francisco Regional Water System (RWS) and local groundwater sources. The Alternative Water Supply program was established to evaluate non-traditional or "alternative" water supply options such as expanding storage, groundwater banking, transfers, purified water (potable reuse), desalination, and technological innovations that can increase supply.

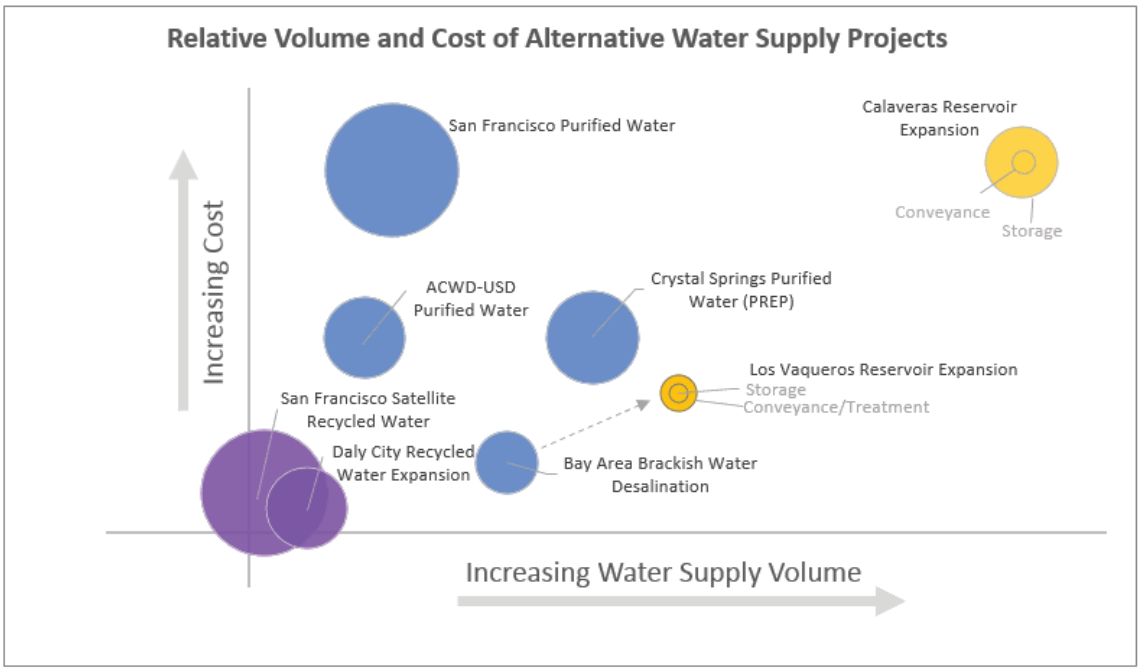
There are 15 projects listed as part of the SFPUC's Alternative Water Supply program. While they all support the SFPUC's goal of balancing future water needs, they are not all water supply projects. The projects that can provide direct water supply benefits and are currently being evaluated include four regional water supply projects, two regional storage expansion projects, and two local water supply projects in San Francisco.

In addition to regional and local water supply projects, the Alternative Water Supply program includes the evaluation of supporting and complementary infrastructure 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 two projects 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 Alternative Water Supply projects.

The relative volume and cost of the alternative water supply projects are shown in the figure below. Purple dots represent non-potable supply projects, blue dots represent potable supply projects, and yellow dots represent storage projects.



Dot size is an indicator of relative $/AF costs. The sizes are intended for illustrative purposes only, as project-specific costs are still being developed.

Purple dots represent non-potable supply projects. **Blue dots** are for potable supply projects. **Yellow dots** represent storage projects.

3.3 Planning Needs, Priorities and Service Objectives

The need to pursue these 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 strategy 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 water supply impact of this new flow requirement in the Tuolumne River would be approximately 93 million gallons per day (mgd) during dry years at our 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. We are hopeful that this will result in a smaller gap during dry year conditions than what is currently anticipated. 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 Level of Service (LOS) Goals and Objectives.

In our planning framework, water supply needs will be met in 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 can be summarized as:

- 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
- Maintain 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. Developed in line with this framework, the current planning effort and the focus of the Alternative Water Supply program is on meeting the following needs:

Water Supply Need	Timing of Supply Shortfall	Volume (mgd)
Dry Year Transfers	Drought (near-term)	2
SUBTOTAL Water Supply Needs, WSIP Carryover		**2**
Instream Flow Obligations - San Mateo Creek	Drought (near-term)	3[1]
Instream Flow Obligations - Tuolumne River[2]	Drought (near-term)	93
SUBTOTAL Instream Flow Obligations		***96***
San Jose & Santa Clara (Historical Demand)	All Years	9
San Jose & Santa Clara (Additional Demand - 2028)	All Years	6.5
Anticipated Demand Increase	All Years	TBD
SUBOTAL Customer Demands		***>15.5***
Total Drought (Near-Term) Needs		**98**
Total All Year Needs		**>15.5**
TOTAL NEEDS		**113.5**

[1] Flow release averaged over wet and dry years is 3.5 mgd; however, the average over dry years is 3 mgd

[2] SFPUC's estimated contribution to an environmental flow obligation associated with the Bay Delta Water Quality Control Plan in average annual terms, calculated over the design drought

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 2040.

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 with Wholesale Customers, 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 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. The SFPUC has also 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.

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 dry year needs of up to 98 mgd were identified; therefore, they do not count toward meeting our current water supply needs that are the focus of the AWS Program.

3.6 Planning for Implementation

(updated June 2021)

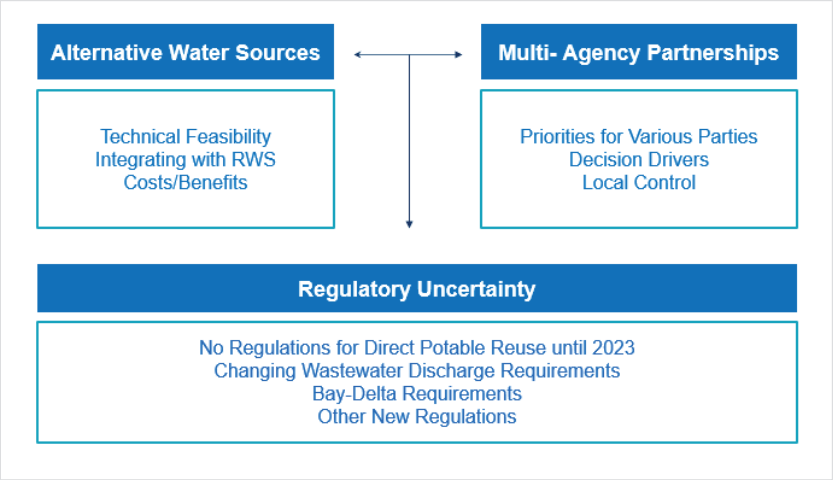
If all the projects identified through the SFPUC's current AWS planning process to date could be implemented, there would still be a supply shortfall to meet dry year demands with San Jose and Santa Clara all-year water supply needs included. Furthermore, each of the supply options being considered has 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 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 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.



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 (DPR). Without clear regulatory guidance, projects with DPR components are at risk due to uncertainties concerning water quality criteria, treatment technologies, and overall feasibility.

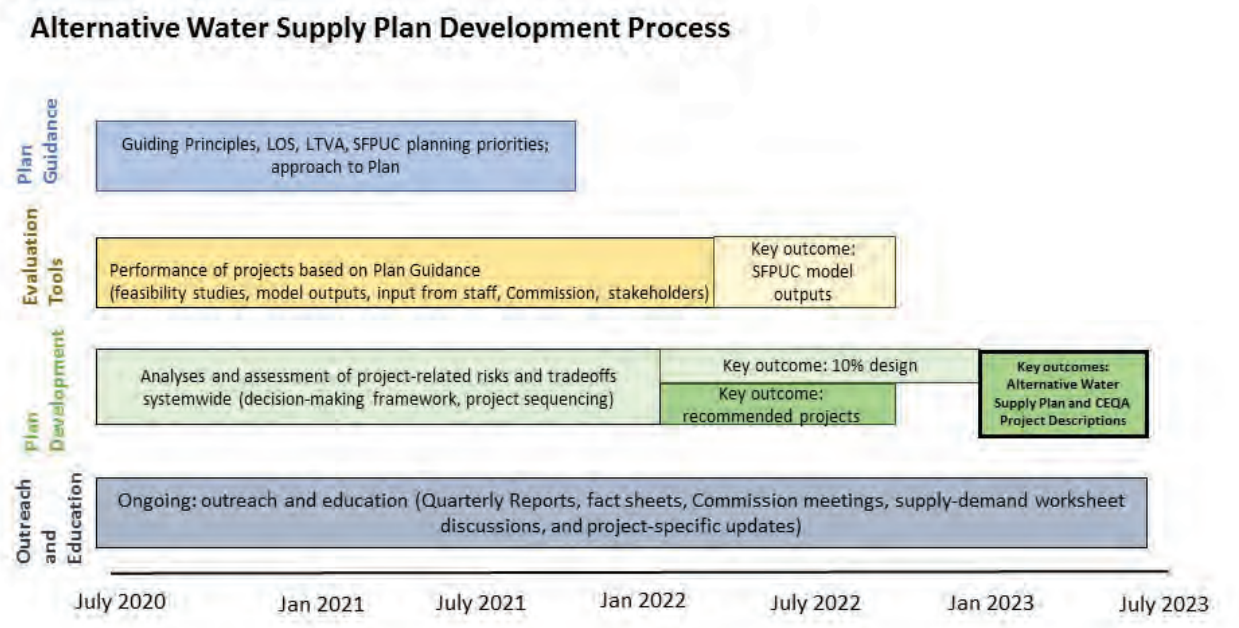
3.8 Timeframe

Planning remains in the early stages for the proposed Alternative Water Supply projects. Given the level of complexity and uncertainty around implementation, we expect that they will take between 10 and 30 years to implement. As we continue to plan, we will take into account the timing of water supply needs 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.

3.9 Moving Toward Environmental Review

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. However, the SFPUC's dry year needs may be imminent and decisions to make San Jose and Santa Clara must be made by 2028.

SFPUC staff have developed an approach and timeline to substantially complete planning and initiate environmental review by July 2023 for a majority of the alternative water supply projects under consideration. This approach will allow sufficient time for environmental review so that decisions about the permanent status of San Jose and Santa Clara can be made by 2028.

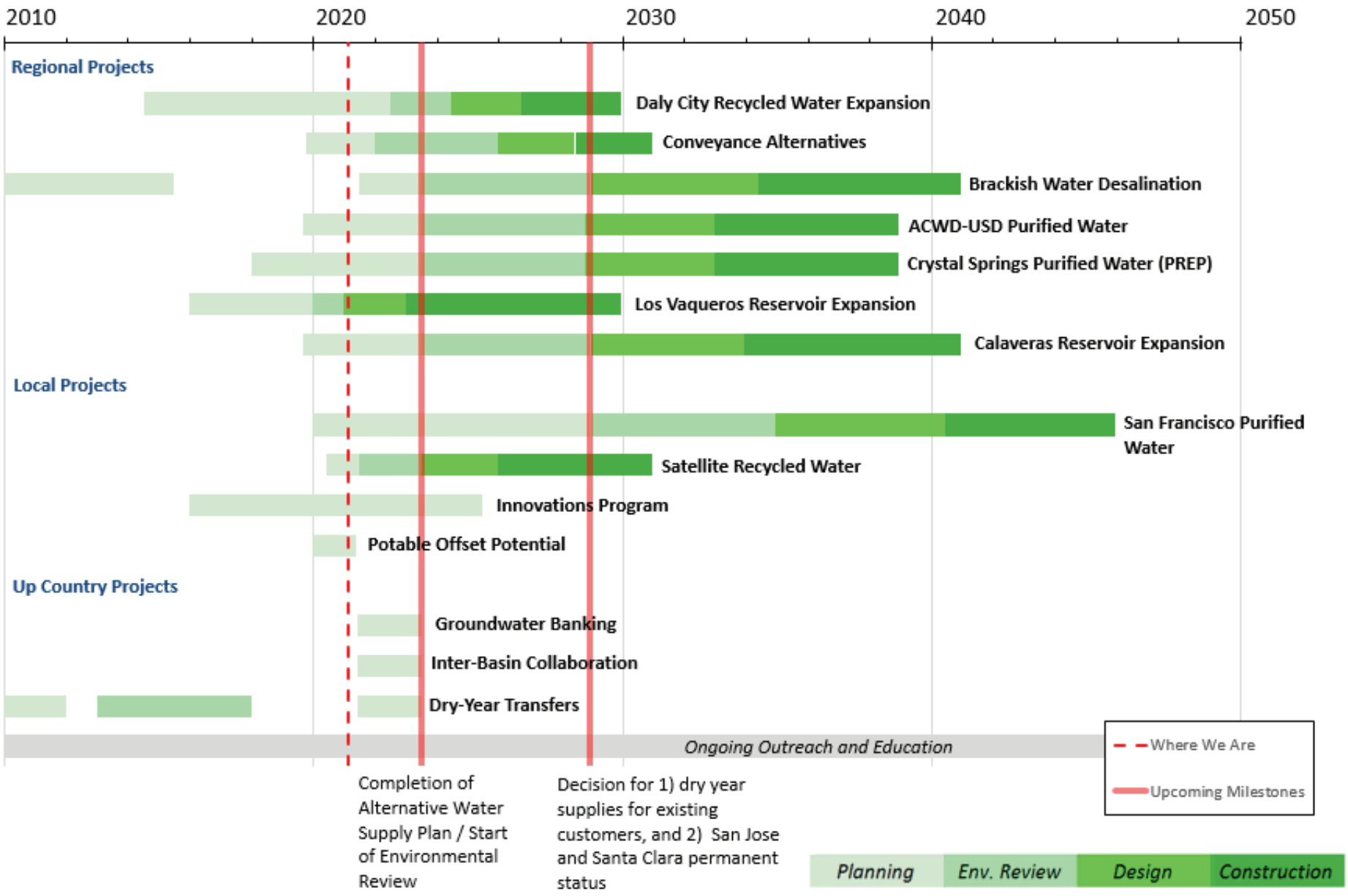


Although individual project evaluations and regular reporting and coordination are already underway, there is a need for a cohesive Alternative Water Supply Plan (Plan) that ties together the planning objectives, assumptions and approach to guide the planning and evaluation process ahead of significant project development decisions by the Commission. As shown in the figure above, the Plan guidance will be developed concurrently with ongoing project-level feasibility analyses and program reporting and outreach.

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. The Los Vaqueros Reservoir Expansion (LVE) Project is an exception to this schedule because of external project drivers. In this case, the SFPUC decided to continue to participate in planning and design in September of 2020 and will need to decide whether to participate in the broader project implementation by December 2021. SFPUC staff are working toward having necessary project planning information and Plan guidance in place in time for the Commission to make an informed decision.

A high-level schedule overview of each alternative water supply project is shown on the next page.

Proposed Programmatic Schedule



3.10 Staffing

In order to advance the planning for several of these Alternative Water Supply projects expeditiously, the SFPUC has established a new group within the Water Resources Division, and a manager for this group was hired in December of 2020. In February and March of 2020, two new project managers were hired to focus on the detailed project-specific regional planning efforts underway. To ensure that the SFPUC can meet its objective of developing an Alternative Water Supply Plan to provide a framework for decision-making on a programmatic level, a third project manager will be added to the team in the next quarter to focus on the Plan development.

3.11 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 established a Water Supply Task Force within the SFPUC 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.

3.12 Funding and Expenditures

(updated June 2021)

The Commission approved project budgets totaling over $25 million in the current 2-year budget cycle for the continued planning of regional and local projects in February of 2020. Funding of $17 million has been encumbered for regional projects in the current fiscal year 2020-2021. An additional $6 million is available for regional projects. For local projects, $6.3 million in funding is currently available to pursue exploration and planning for reuse.

The regional funds are aimed at completing planning studies for the Daly City Recycled Water Expansion Project, Crystal Springs Purified Water Project, ACWD-USD Purified Water Project, LVE Project, and Conveyance Alternatives. We anticipate that we will move into the design phase of the Daly City Recycled Water Project (unless a non-recycled water alternative is preferred after an alternatives analysis) and if conveyance is not a barrier, we could enter into Service Agreements and participate in a JPA for the construction and implementation of the LVE

Project. The level of funding sought in this period assumes we will be in a position to continue to move forward on all of the current planning efforts.

3.13 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 are currently working through a Water as-needed contract to conceptualize an alternative intertie with EBMUD, and completing work to report the results of PureWaterSF through another contract. We anticipate utilizing additional professional services support to advance planning efforts.

3.14 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.