




December 8, 2020

To: Commissioner Sophie Maxwell, President
 Commissioner Anson Moran, Vice President
 Commissioner Tim Paulson
 Commissioner Ed Harrington

Through: Harlan L. Kelly, Jr., General Manager 
From: Steven R. Ritchie, Assistant General Manager, Water *Steven R. Ritchie*
 Paula Kehoe, Manager, Water Resources Division

Re: Alternative Water Supply Planning Quarterly Update

Enclosed please find the Quarterly Report for Alternative Water Supply Planning, which provides an update on the status of regional and local water supply, storage and related infrastructure projects that are being planned in the SFPUC's service area.

Within this decade, the Commission will have to make choices about how to meet customers' drought year needs and whether to make San Jose and Santa Clara permanent customers of the SFPUC. The projects described in this report represent the options that have been identified and are being evaluated by staff. By July 2023, the SFPUC will prepare an Alternative Water Supply Plan, a framework for considering water supply needs and related tradeoffs. In the meantime, these quarterly reports provide insight into the planning process.

The format of this report is similar to the September 2020 report. Program highlights in this report include a description of the various project partnerships that are being developed and a deeper discussion of the Los Vaqueros Reservoir Expansion Project.

cc: Nicole Sandkulla, BAWSCA
 Tom Francis, BAWSCA

- London N. Breed**
Mayor
- Sophie Maxwell**
President
- Anson Moran**
Vice President
- Tim Paulson**
Commissioner
- Ed Harrington**
Commissioner
- Harlan L. Kelly, Jr.**
General Manager





Photo: San Francisco, 2019

Alternative Water Supply Planning Quarterly Report

December 2020

Table of Contents

Section 1: Programmatic Update	4
Overview	4
Program Status and Highlights	4
Project Partnerships	6
San Jose and Santa Clara	8
Project Spotlight: Los Vaqueros Reservoir Expansion Project	9
Section 2: Project Updates	12
Regional Projects.....	12
Daly City Recycled Water Expansion	12
ACWD-USD Purified Water	13
Crystal Springs Purified Water (PREP)	14
Los Vaqueros Reservoir Expansion	14
Bay Area Brackish Water Desalination	16
Conveyance Alternatives	17
Bay Area Regional Reliability Shared Water Access Program (BARR SWAP)	18
Calaveras Reservoir Expansion	19
Upcountry Projects	19
Groundwater Banking	19
Inter-Basin Collaborations	20
Dry Year Transfers	20
Local Projects	20
San Francisco Purified Water	20
Satellite Recycled Water	20
Innovations Program	21
Potable Offset Potential	21
Project Summaries	21
Section 3: Program Background	38
Planning Priorities and Service Objectives	38
Ongoing Conservation, Recycled Water and Groundwater Programs.....	39
New Alternative Water Supplies	40
Planning for Implementation	42

Schedule.....	42
Staffing.....	44
Water Supply Task Force.....	44
Funding and Expenditures.....	44
Professional Services Contracts.....	45
Trends and Risks.....	45

Section 1: Programmatic Update

Overview

The SFPUC Regional Water System (RWS) is an expansive infrastructure network that collects, stores, treats and distributes a blend of water supplies from the Tuolumne, Peninsula and Alameda watersheds. The RWS serves retail and wholesale customers in San Francisco, San Mateo, Santa Clara and Alameda counties. The RWS has been the backbone of the SFPUC's water supply since the 1930s. With the implementation of the Water System Improvement Program (WSIP) that began in 2008, the SFPUC is ensuring that the RWS will continue to provide safe and reliable water supply for its 2.7 million customers day after day, around the clock for decades to come.

In recent years, regulatory drivers and customer requests have brought to light the need for the SFPUC to make policy choices about future commitments and augment surface water supplies from the RWS within the current 25-year planning horizon. To address these needs, the SFPUC established the Alternative Water Supply Program in early 2020.

The current planning effort is focused on meeting the following water supply needs:

1. Up to 98 million gallons per day (mgd) in drought years (to meet current needs for existing customers and offset obligations to the environment); and
2. Between 9 and 15.5 mgd in all years (at a minimum, to make the Cities of San Jose and Santa Clara permanent customers of the SFPUC).

Through the Alternative Water Supply Program, the SFPUC is evaluating new water supply projects including expanding storage, groundwater banking, transfers, purified water (potable reuse), desalination, and technological innovations and other tools that can increase supply or reduce demand. Current planning entails developing new regional partnerships, conducting technical and institutional feasibility studies, and evaluating how these new supplies can be integrated with existing RWS supplies. By July 2023, the SFPUC will develop an Alternative Water Supply Plan, a planning framework to help guide its decisions to proceed with environmental review and continue the development of projects that can best meet anticipated water supply needs.

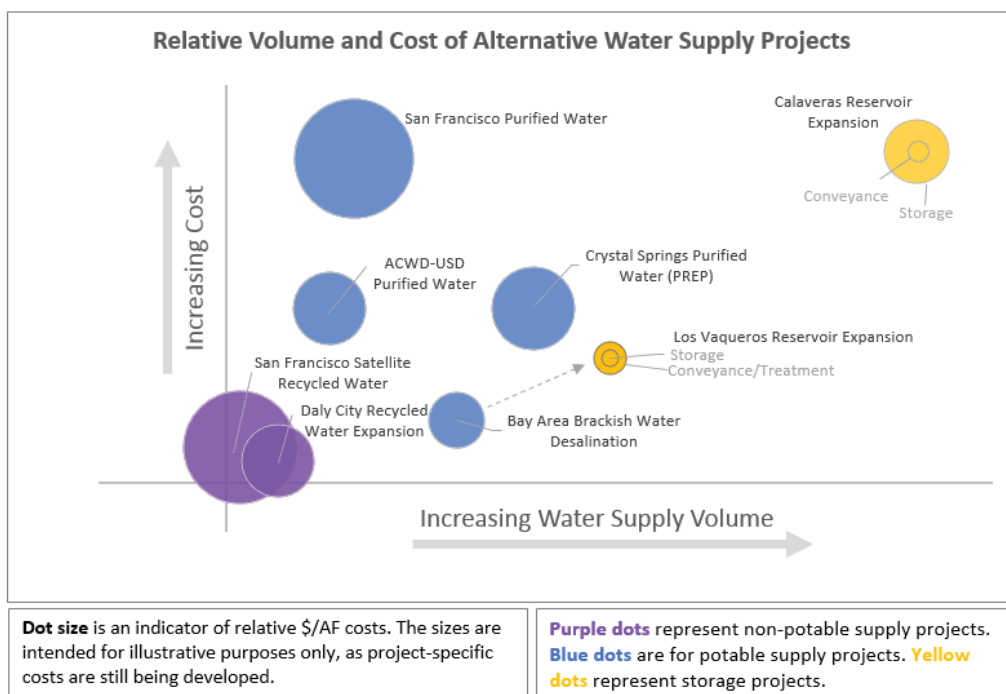
Each quarter, the SFPUC documents updates to its ongoing planning activities for the Alternative Water Supply Program as a whole and for each project being considered. The progress made in planning for the period between September and November 2020 is the subject of this quarterly report.

Program Status and Highlights

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. This group of projects is shown in **Figure 1** below, demonstrating relative cost and volume of anticipated water supply and storage projects. The size of the bubble representing each project is a depiction of its average anticipated unit cost, illustrating the relative cost to supply ratio of each project.

Figure 1. Relative Volume and Cost of Alternative Water Supply Projects



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 this report, 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 provide the greatest water supply volume and can be operated to maximize drought

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 drought 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. Larger non-potable projects that are being developed in the service area by Wholesale Customers are outside the scope of this Alternative Water Supply Program.

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.

Project Partnerships

A common feature among the Alternative Water Supply projects is that a majority will require multi-party partnerships; among the regional and upcountry projects, the only exception is the Calaveras Reservoir Expansion Project, which would be entirely owned and operated by the SFPUC. Regional partnerships have many benefits. They can take advantage of existing infrastructure across service areas. With cost-sharing and availability of grant opportunities, they can also result in lower costs for each partner and their ratepayers. However, depending on their nature, partnerships can also present planning and implementation challenges. Understanding these risks can provide some perspective on the Alternative Water Supply program.

The first step in understanding partnerships is understanding who the partners are and their interests. Broadly, the SFPUC's project partners fall into six categories: public water agencies who serve urban municipal areas, a private water utility, irrigation districts who serve agriculture areas, a water district that serves wildlife refuges, wastewater utilities, and state and federal agencies. These categories reflect the different primary drivers that influence the participation of each partner in a project.

One of the simpler project partnerships in the program is represented by the Daly City Recycled Water Expansion Project. As shown in **Figure 2** below, there are currently three project partners – the SFPUC, the North San Mateo County Sanitation District (Daly City), and the California Water Service Company (Cal Water). Each of the partners has a slightly different goal reflecting its participation in the project. Both the SFPUC and Daly City are seeking a new water supply, albeit for different reasons. The SFPUC's primary benefit will be in lieu groundwater recharge that results from cemeteries reducing their pumping in the South Westside Basin. Importantly, the project can help reduce some risks associated with mitigation requirements of the Groundwater Storage and Recovery (GSR) Project. For Cal Water, increasing recycled water supply will add to its local water sources and help limit future reliance on the RWS. The project will also provide Cal Water with new irrigation customers in their service area, but those customers will be sensitive to any changes in cost

or water quality. Daly City will benefit from the project if it reduces discharges to the Pacific Ocean and enables greater reuse of wastewater flows. However, depending on the treatment process required, operations and maintenance needs may increase, and discharge concentrations may impact Daly City’s National Pollutant Discharge Elimination System (NPDES) permit.

Figure 2. Daly City Recycled Water Expansion Partnership Structure

	SFPUC	Daly City (Sanitation District)	Cal Water
Project Goal	Increase drought supply reliability	Reduce ocean discharges	Develop local supplies
Partner Characteristics	<ul style="list-style-type: none"> Groundwater Storage & Recovery Project Partner Regional water supplier 	<ul style="list-style-type: none"> Groundwater Storage & Recovery Project Partner SFPUC Wholesale Customer 	<ul style="list-style-type: none"> Subject to CPUC rules and rate-setting Groundwater Storage & Recovery Project Partner SFPUC Wholesale Customer

For this project, there are some unique characteristics of each partner agency that help further align interests: both Daly City and Cal Water are SFPUC Wholesale Customers, and there is a shared interest in increasing systemwide drought supply reliability. Moreover, all three agencies share a common interest in the underlying South Westside Basin as project partners in the GSR project. That Cal Water is a private utility may impact how and when it can participate in this water supply project. Cal Water is subject to the rules and processes of the California Public Utilities Commission (CPUC), including operating on a three-year rate-setting cycle. This can affect the project schedule and cost structure.

As this example demonstrates, the motivation to participate in a project and characteristics that either differentiate or align agencies’ interests indicate how easily different partners can work together toward common project goals. Across the program, the SFPUC is engaged in many kinds of partnerships. With some partners, we have one or more common interests that exist outside of a specific project. For example, the Alameda County Water District (ACWD) is both a Wholesale Customer of the SFPUC and a State Water Project Contractor who receives water supply via the South Bay Aqueduct (SBA), a State-owned facility that the SFPUC is evaluating as a conveyance option. These overlapping interests result in an alignment of project goals for the Los Vaqueros Reservoir Expansion Project. In other cases, project partners have entirely different characteristics and motivations that come together based only on a mutual interest in a specific project. Such projects require more deliberate collaboration and coordination around the project for the partnership to remain strong.

The number of partners participating in any given project also contributes to its complexity. For instance, there are currently six partners in the Crystal Springs Purified Water project, representing both water and wastewater utilities. All partners have to agree on scope, schedule, responsibilities, and cost-share at every step of project development. Any agreements among partners need to be reviewed and approved by each partner’s legal advisors, and that can add time and complexity to negotiating agreements.

Given the importance of strong partnerships to the success of the Alternative Water Supply projects, developing a clear foundation for partnerships is an important part of the planning process for the Alternative Water Supply program. After assessing preliminary technical feasibility, SFPUC staff are working with project partners to develop a Term Sheet. The Term Sheet provides a framework for the institutional structure of the alternative water supply project. It includes clearly defined goals and benefits for each partner, describes roles and responsibilities, and lays out principles for cost-sharing and other aspects of planning and implementation. While not legally binding, a Term Sheet reflects and documents a shared understanding among partners.

In the next six to eight months, the SFPUC will develop Term Sheets for the Daly City Recycled Water and Crystal Springs Purified Water projects. A detailed Term Sheet to establish a Joint Powers Authority (JPA) for the Los Vaqueros Reservoir Expansion project was prepared in 2019.

San Jose and Santa Clara

One of the key policy decisions that will result from the Alternative Water Supply program will be whether to make the Cities of San Jose and Santa Clara permanent customers of the SFPUC. San Jose and Santa Clara are interruptible customers. Unlike the twenty-four Wholesale Customers who currently have permanent status, San Jose and Santa Clara are not included in the Supply Assurance that provides assurance of water supply in perpetuity. This section describes the continued planning and coordination around the potential to make San Jose and Santa Clara permanent on a programmatic level.

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.

In order to make San Jose and Santa Clara permanent customers, the Commission would have to identify additional water supplies of between 9 mgd (based on historical demands of 4.5 mgd each) and 15.5 mgd (based on projected demands in the planning horizon). In accordance with the WSA, as amended, the Commission will have to decide on their status by December 31, 2028. By completing planning for Alternative Water Supply program by 2023, the Commission will have the necessary information to provide direction and pursue environmental review on projects to help make a decision by the end of 2028.

Figure 3. Process for Permanent Status Decision



Since August, the SFPUC has participated in monthly meetings with BAWSCA, San Jose and Santa Clara to collaborate on water supply planning. San Jose and Santa Clara have reaffirmed their desire to gain permanent customer status with a minimum guaranteed supply of 4.5 mgd each. They have also expressed an interest in exploring all supply options, including all forms of potable reuse.

Both San Jose and Santa Clara also get water supply from Valley Water (formerly Santa Clara Valley Water District). Although Valley Water supply does not serve the northern portions of the two cities where growth is planned, we have expanded planning discussions to include Valley Water so that we may seek joint solutions to address the needs of our common customers. As Valley Water is a partner with the SFPUC in multiple Alternative Water Supply projects, has an emergency intertie with the SFPUC, and is a South Bay Aqueduct (SBA) Contractor, there may be opportunities to find synergies to help bridge the water supply gap for San Jose and Santa Clara. Meanwhile, the SFPUC is continuing to evaluate Alternative Water Supply projects, in accordance with stated **planning priorities**, with the intention to serve San Jose and Santa Clara on a permanent basis.

Project Spotlight: Los Vaqueros Reservoir Expansion Project

Beyond the quarterly update on recent activity that follows in the next section of this report, the purpose of this featured discussion is to describe one project in greater detail - in the context of the Alternative Water Supply program - to provide greater insight on how it relates to other projects for future decision-making. This quarter, the spotlight is on the Los Vaqueros Reservoir Expansion (LVE) Project.

The LVE Project is unique among the Alternative Water Supply projects in a few important ways: 1) it is moving ahead at an accelerated pace compared to other projects; 2) it represents the broadest and most complex of partnerships currently in planning; and 3) it relies on additional, separate projects to provide water supply reliability to the SFPUC.

Contra Costa Water District (CCWD) is currently leading the planning and development of the LVE Project, which will increase the capacity of the existing CCWD-owned and operated reservoir by 115,000 acre-feet. This proposed expansion will be operated as a regional project that sits atop a CCWD facility and is intended to improve urban water supply reliability and provide ecological benefits to refuges while protecting Delta fisheries. The project has broad stakeholder support and has received a conditional award of over \$450 million from the California Water Commission in addition to federal funding

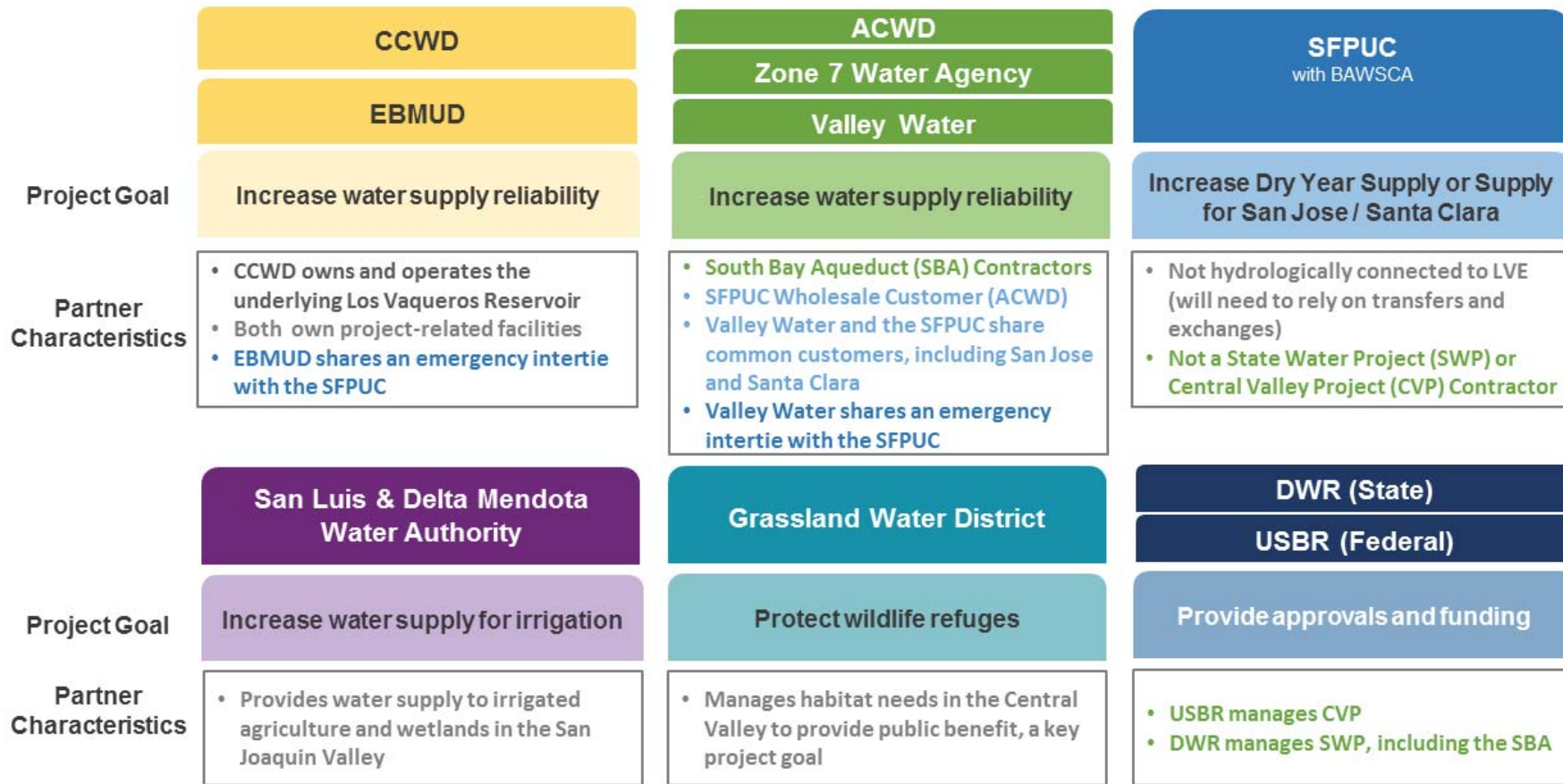
from the US Bureau of Reclamation. Grant funding could cover over 50% of the estimated capital costs of the project. As a result, grant-related milestones are important drivers of the project schedule. Specifically, by January 1, 2022, the LVE Project must secure at least 75% of the local funding and complete permitting. To meet the January 2022 commitments, the project team is establishing a JPA to govern the project and intends to enter into financially binding agreements (Service Agreements) before December 31, 2021.

As described in the section on [Project Partnerships](#), the size and scope of a partnership can add significant complexity to a project. The LVE Project represents a broad partnership with agencies representing various interests, as shown in **Figure 4** on the next page. Governance of the LVE project through a JPA will require careful planning on issues ranging from voting rights to withdrawal provisions. Outside legal counsel has been retained by the LVE Project to help support the establishment of a JPA Agreement. The City Attorney's Office and SFPUC Finance are supporting the SFPUC's participation in the planning process.

The SFPUC is not hydrologically connected to the Los Vaqueros Reservoir or any related CCWD facilities. Therefore, to benefit from storage in the LVE Project, the SFPUC will have to 1) enter into a water transfer or exchange to deposit water in storage, and 2) enter into a wheeling agreement to convey water through other facilities into the SFPUC's service area. Water supply and conveyance currently present the most significant risks associated with this project for the SFPUC; without them, storage has limited value. Staff are currently evaluating options for both, and recent progress is detailed in the [project updates](#) presented later in this report. For this discussion, it is important to note that both water supply and conveyance are critical aspects of the feasibility of this project for the SFPUC and they are separate from the feasibility of the LVE Project itself, which is focused on storage.

The primary conveyance route being considered to support the SFPUC's participation in the LVE Project is the SBA, a State Water Project facility owned and operated by the California Department of Water Resources (DWR). DWR and the three agencies that maintain contracts for the use of the SBA: Zone 7 Water Agency, ACWD, and Valley Water (SBA Contractors), are also involved in the LVE Project. SFPUC and BAWSCA staff are coordinating closely with the SBA Contractors to determine the available capacity, timing and conditions for potential use of the SBA to convey water to the SFPUC's service area. Depending on delivery location, volume and timing, other issues such as water quality may need to be addressed further. The ongoing planning efforts will converge in 2021 to help the SFPUC make an informed decision about continued participation in the implementation of the LVE Project.

Figure 4. Los Vaqueros Reservoir Expansion Partnership Structure



Section 2: Project Updates

Staff are currently studying the feasibility of eight regional and four local projects that can contribute to meeting the needs and priorities identified for this planning effort. Three upcountry projects have also been identified and planning for those could begin in the coming months. 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. All these efforts are described in subsequent sections, which are organized geographically.

Regional Projects

Daly City Recycled Water Expansion

This project can produce up to 3 mgd of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 mgd or 1,400 acre-feet per year. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, 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 and Daly City, and the irrigation customers are located largely within the California Water Service Company's (Cal Water's) service area. As such, in recent months, Cal Water has been taking a more direct role in the development of the project. RWS 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.

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

- 1) Is there potential to increase production at Daly City?
- 2) Are there alternatives to the baseline recycled water project that might help mitigate project risks associated with the GSR project and increase drought year reliability in the South Westside Basin?
- 3) How will responsibilities and costs be allocated among the project partners?

In this quarter, to address the questions above, SFPUC staff have continued to meet with Cal Water and Daly City regularly to discuss each agency's potential roles and responsibilities. Cal Water has engaged in a parallel planning effort to evaluate its investment opportunities regionally and that study will help inform their participation over the course of the next year. The partner agencies will continue to coordinate regularly as roles, responsibilities and relative cost-

shares are defined for this project, culminating in the development of a Term Sheet for the project.

On November 4, the project team held a workshop with Daly City to better understand constraints and opportunities to increase treatment capacity at the wastewater plant. Increasing supply could serve additional demands or augment groundwater storage. If either option is feasible, it could reduce the unit cost of the project and increase supply reliability.

Meanwhile, SFPUC staff and the consultant team have started to identify conceptual alternatives to the baseline recycled water project. Close collaboration with SFPUC staff working on the GSR project is a critical component of considering alternatives that may be feasible and beneficial to the SFPUC's broader drought supply goals. On November 17, the project team met with the GSR team to review conceptual alternatives as well. Between these initial coordination meetings, the project team has a better understanding of which conceptual alternatives should be studied further.

In the coming quarter, planning assumptions will be refined and there will be additional discussion with Daly City regarding the potential to increase treatment capacity within the limited space at the wastewater facility. SFPUC staff will also help model the alternatives to understand their impact on the South Westside Basin.

ACWD-USD Purified Water

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 would 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.

During this quarter, the project consultant team interviewed and reported on lessons learned from other successful purified water projects in California: Orange County, San Diego and Monterey. The experiences of these projects are instructive in project planning as alternatives are developed and evaluated. Some of the key takeaways identified include:

- A demonstration facility run by trained staff is the most effective way to engage with the community, policymakers and other stakeholders;
- Outreach should start early and be sustained from planning through implementation; and
- Project costs should be allocated based on benefits to partners, and all partners should recognize benefits.

In December, the project partners will identify conceptual alternatives for further analysis in 2021.

Crystal Springs Purified Water (PREP)

The Crystal Springs Purified Water (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. To evaluate the merits of the project as a water supply to meet drought 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. In this quarter, the SFPUC and partners negotiated and approved the Memorandum of Agreement in order to commence Phase 3. The Commission approved the SFPUC's participation on October 27. The SFPUC's contribution to the study includes funding of \$160,000 and an in-kind technical evaluation by operations and planning staff to better understand the impact of this project on RWS operations. Also, as part of Phase 3, the project partners will develop a framework for continued cooperation and cost sharing (Term Sheet) and develop a Fact Sheet to begin public outreach.

Los Vaqueros Reservoir Expansion

As highlighted previously in this report, 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 must be better understood before the SFPUC can determine the extent of participation in the LVE project. As such, this project is being planned in conjunction with three other projects:

1. Conveyance Alternatives (evaluating conveyance from LVE to RWS facilities);
2. Brackish Water Desalination (potential supply source for exchange and storage in LVE); and
3. 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.

Another important planning consideration for the SFPUC has been the prioritization of water supply needs. Is LVE best suited to meet the drought needs associated with our Level of Service goal to limit rationing to no more than 20% systemwide (highest priority) or to provide supplies that can enable making San Jose and Santa Clara permanent customers? Can it do both? While we have not answered these questions, our approach has been to first identify the possible pathways, volumes and timing for deliveries. We know that conveyance through the SBA will be limited and delivery may not be reliable, so it is not likely that we can meet all our needs with this project. In non-drought years, the SBA is in use by SBA Contractors and additional capacity for the SFPUC will necessarily be limited. What water can be made available then likely cannot be stored in San Antonio without displacing other RWS supplies, so we would have to rely on exchanges for (limited) normal year deliveries.

During this quarter, there have been several significant developments. As this project is moving at an accelerated pace, this will continue to be the case through project planning. The updates are grouped in the paragraphs that follow.

Planning and Permitting

The LVE Project partners negotiated Amendment No. 2 to the Multi-Party Cost Share Agreement, which extends project planning and permitting through 2021. The cost of this extended planning phase is approximately \$6.1 million, shared equally among partners. In September, BAWSCA's Board of Directors took the decision to withdraw from continued participation as a separate and independent partner in the project. This action signals that BAWSCA is no longer seeking water supply benefits from the project over and above those already represented by the SFPUC's participation. BAWSCA remains interested in the potential water supply benefits of the LVE Project and supports the SFPUC's continued engagement in ongoing planning activities. Staff from the SFPUC and BAWSCA still coordinate closely, and BAWSCA staff are participating in project planning with the LVE project partners. On November 10, the Commission authorized the SFPUC's continued participation in the LVE Project

with a funding commitment of \$868,852. If the number of partners decreases further, that commitment could increase up to approximately \$1 million.

Formation of a Joint Powers Authority (JPA)

The project team has retained outside legal counsel to lead the formation of a JPA. A Legal Work Group representing all project partners has also been formed. SFPUC representation on the Legal Work Group is through the City Attorney's Office, in close cooperation with SFPUC staff. During the quarter, the Legal Work Group continued to negotiate terms and provisions of the draft JPA such as voting, funding, staffing and withdrawal. These provisions continue to be negotiated and discussed.

Usage Fees

The LVE Project includes the use of underlying facilities owned by CCWD and EBMUD. Therefore, each of these agencies will assess facility use charges, or usage fees, to recoup proportionate costs of operating and maintaining those facilities. Both CCWD and EBMUD prepared memoranda (in September and October, respectively) describing their methodology for calculating usage fees, and there have been discussions with staff representing the partners. The SFPUC and other partners have shared feedback with CCWD. While not finalized, CCWD will memorialize the negotiations to date in a Letter of Intent while EBMUD is soliciting initial feedback from partner agencies on their usage fee calculations. A pro forma financial model that was developed for the LVE Project in 2019 is also being updated with current assumptions on usage fees.

As described in the [Project Spotlight](#), key grant-related milestones are driving the schedule for the LVE Project. As a result, the project partners will need to complete the planning activities described above and make significant financial commitments by December 31, 2021. Therefore, the supply and conveyance projects described in the subsequent update sections are critical to decision-making on the LVE Project.

Bay Area Brackish Water Desalination

The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, SFPUC, Valley Water, and Zone 7 Water Agency. EBMUD and ACWD may also participate in the project. 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 drought conditions when combined with storage at LVE. In the coming months, SFPUC staff will also evaluate supply alternatives for storage in LVE.

For the Regional Desalination Project, private water operators have previously expressed interest in developing this project as a public-private partnership. Last quarter, staff worked with a consultant to evaluate issues associated with

water rights. 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 will provide additional information on the potential for exchanges using LVE. In order to realize the maximum regional benefits of a Brackish Water Desalination project, exchange opportunities must be better understood. CCWD and Valley Water staff are currently in discussions with the U.S. Bureau of Reclamation for guidance on the condition for exchanges among Central Valley Project partners. The exchange pilot is expected to be completed in 2021 and will be instructive for other regional exchanges. No additional work is anticipated for this project until the pilot is complete. Meanwhile, SFPUC staff are seeking alternatives for transfers and exchanges as supply for LVE storage.

Conveyance Alternatives

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 3 State Water Project contractors (SBA Contractors) who maintain contract capacity for use of the SBA. They include 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 and what constraints may exist to determine feasibility, timing and extent of potential use for the benefit of SFPUC customers.

In August, SBA Contractors shared a model to demonstrate available capacity in the SBA under various hydrologic conditions based on their projected demands in 2040. In this quarter, SFPUC and BAWSCA staff have been analyzing the model and have discussed planning assumptions with SBA Contractors. Preliminary analysis shows intermittent available capacity in drought years, when the SFPUC has indicated a need for water supply. The SFPUC is now refining the timing of potential deliveries and considering flow data from DWR to better understand capacity availability and potential risks. Meanwhile, through the Bay Area Regional Reliability Shared Water Access Program (BARR SWAP) effort described in the next section, the SFPUC is also evaluating potential water quality impacts of bringing new water supplies through the SBA into the San Antonio Reservoir or Sunol Valley Water Treatment Plant. Once there is confidence in the available capacity through the SBA, SFPUC will enter into discussions with the SBA Contractors and DWR regarding the terms and conditions for its 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, including San Jose and Santa Clara, with Valley Water. 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. The SFPUC has retained a consultant team that is evaluating three potential alignments for conveyance, which will be completed in Spring 2021. EBMUD and the SFPUC share an emergency intertie through the City of Hayward, so this alternative considers the development of a new non-emergency intertie. Usage fee cost calculations for the LVE Project provide some estimates that are helpful in evaluating this alternative.

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

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. 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.

A second parallel pilot (Pilot 2A) involves a Central Valley Project (CVP) exchange in Los Vaqueros Reservoir between Valley Water and CCWD. This pilot is planned as a physical transfer in 2021. Although the SFPUC is not participating directly in this effort, the results will be instructive for possible exchanges or transfers of water supply for storage in the LVE Project.

In this quarter, the SFPUC retained a consultant team to support the evaluation of water quality impacts of new water deliveries of up to 20,000

acre-feet in two consecutive years into San Antonio Reservoir or Sunol Valley Water Treatment Plant. The consultant team is collecting historical baseline water quality data now and will be developing scenarios for analysis in the next quarter. BAWSCA initiated a study of potential financial and legal implications of an exchange with ACWD, under various conditions. In September, ACWD temporarily modified their operations to decrease supply from the RWS and simultaneously increase supply via the SBA, effectively simulating an exchange at a small scale (the equivalent of 2,200 acre-feet over a year). This test provided operational insight into facilitating an exchange.

Calaveras Reservoir Expansion

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.

During this quarter, a consultant team helped staff prepare a study on four potential dam raise scenarios. A draft report has been prepared and is under internal review. The preliminary analysis indicates that an expansion of the dam at various elevations is technically feasible. Water supply, conveyance, and the evaluation of capacity constraints at related facilities are still to be determined and will be evaluated in the coming months.

Upcountry Projects

Groundwater Banking

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.

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

Inter-Basin Collaborations

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.

As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement. No new development has occurred during this reporting period.

Dry Year Transfers

During the planning and implementation of the Phased WSIP, the SFPUC pursued a long-term agreement to transfer 2 mgd from MID in drought 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. 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. No new water transfer developments occurred during this reporting period.

Local Projects

San Francisco Purified Water

The San Francisco Purified Water Project is a concept that envisions providing a new, local drinking water supply in San Francisco. The project would treat secondary effluent sourced from the Southeast Treatment Plant or Oceanside Treatment Plant 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. Before engaging at a project-level, the SFPUC will participate in research and data collection around water quality and process reliability for purified water opportunities.

With the successful completion of PureWaterSF, San Francisco's initial research and demonstration of a small-scale Direct Potable Reuse (DPR) project, the SFPUC is beginning to plan next steps for the development of purified water. SFPUC staff has begun putting together a scope of work to consider the size and scope of purified water opportunities in San Francisco, as well as identify research, training and outreach needs.

Satellite Recycled Water

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. 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). In this quarter, the consultant team worked with SFPUC staff to develop a database of existing dual-plumbed buildings and compiled water consumption data from those buildings; the team also started developing customer groupings.

Innovations Program

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. Within the reporting period, the SFPUC continued to pilot different leak detection technologies and is contracting to get Zero Mass Water on board for the atmospheric water generation project. SFPUC staff also worked on drafting the grant agreement with a San Francisco brewery to implement a brewery process water reuse project.

Potable Offset Potential

The purpose of this project is to explore 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 will identify options and potable water thresholds that may result in policy recommendations. The first step in the planning process will be 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. In this quarter the consultant team prepared a memo of their review of existing potable offset programs.

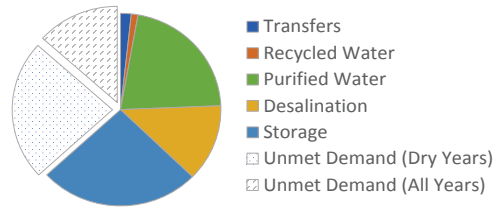
Project Summaries

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
\$299.1M	\$18.3M

Total Project Costs

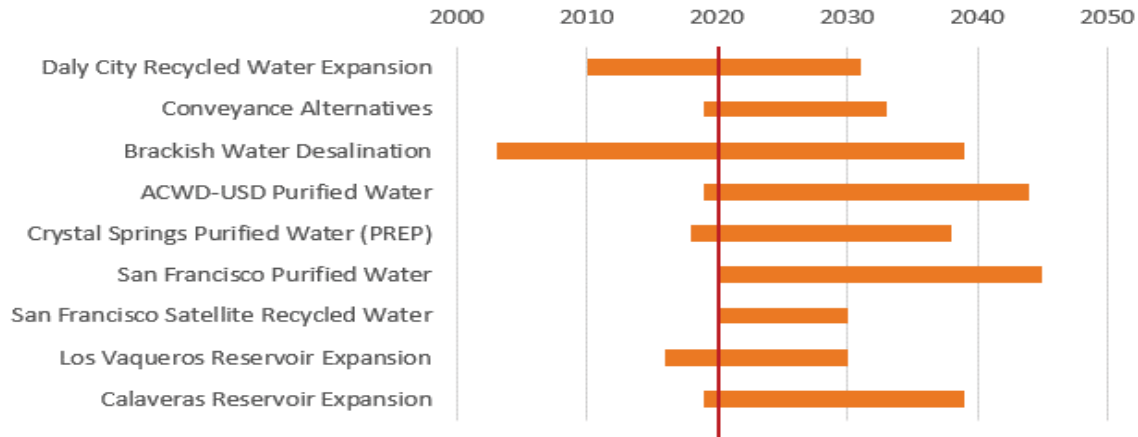
Est. Capital Cost:	TBD	Est. Annual O&M:	TBD

Capital Cost/Acre-Foot

TBD

Programmatic Schedule

Proposed Schedule of Projects



Current Status

Planning

18-Month Outlook

- Feasibility studies underway to identify and analyze project concepts

Risks and Uncertainties

- Determining incremental water supply benefits
- Integrating new supplies with existing supplies

Benefits

- Potential to meet future water supply needs

Daly City Recycled Water Expansion

Project Description

This is a recycled water project that will produce up to 3 mgd of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 mgd or 1,400 acre-feet per year. The primary purpose of the project is to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin (Basin); this will free up groundwater, enhancing the reliability of the Basin. The project is a regional partnership between the SFPUC and Daly City and the irrigation customers are located largely within California Water Service's (Cal Water's) service area. SFPUC Regional Water System customers will benefit from the increased reliability of the South Westside Groundwater Basin for additional drinking water supply during droughts. In this way, this project supports the Regional Groundwater Storage and Recovery Project, which is under construction. This project includes construction of a new two-story treatment facility co-located at Daly City's recycled water treatment plant, approximately 11 miles of 14"-18"-diameter distribution pipelines, 1-2 pump stations and a 2.4 million gallon underground storage tank in Colma. Daly City completed a Mitigated Negative Declaration under CEQA in September of 2017 and 30% design for the project has been completed.



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
TBD	Drought and All Years	Recycled Water / Groundwater Offset	Regional	TBD

Total Project Cost

Est. Capital Cost:	\$85.0M	Est. Annual O&M:	\$2.0M
---------------------------	---------	-----------------------------	--------

Institutional Complexity

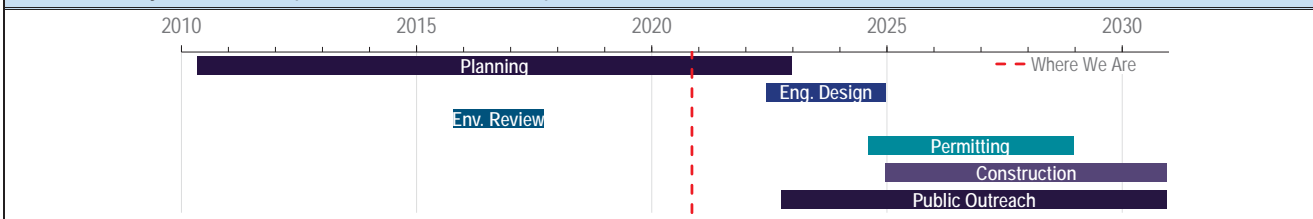
SFPUC Only Multi-Party Partnership

SFPUC Budget Information

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

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

Estimated Project Schedule (Not a Baseline Schedule)



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

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
--------------------	-----	------------------	-----

Institutional Complexity

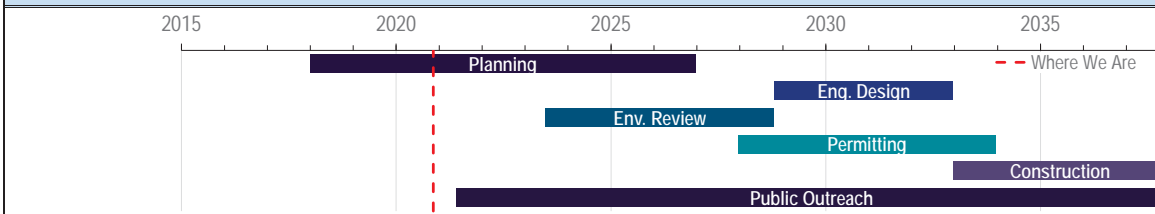
SFPUC Only Multi-Party Partnership

SFPUC Budget Information

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

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
- Identify and evaluate Direct Potable Reuse opportunities
- Initiate outreach and develop fact-sheet

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

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

Manisha Kothari

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
--------------------	-----	------------------	-----

Institutional Complexity

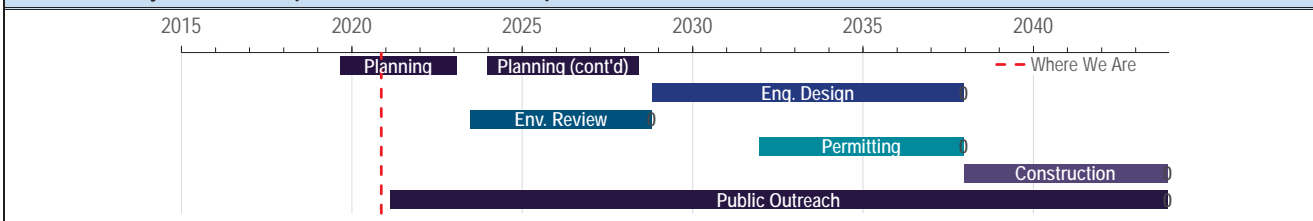
SFPUC Only Multi-Party Partnership

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

SFPUC Budget Information

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning

18-Month Outlook

- Feasibility study underway to identify and analyze purified water (potable reuse) project concepts

Risks and Uncertainties

- Potential water quality change to Quarry Lakes

Benefits

- Leverages existing facilities to provide water supply

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
---------------------------	-----	-----------------------------	-----

Institutional Complexity

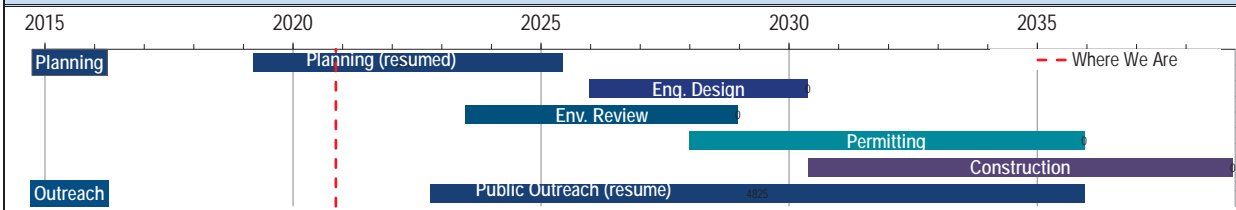
SFPUC Only	<div style="width: 80%; height: 15px; background-color: orange;"></div>	Multi-Party Partnership
------------	---	-------------------------

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

SFPUC Budget Information

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning

18-Month Outlook

- Develop feasible project scenarios, considering water rights and constraints for transfers and exchanges
- Consider public-private partnership options

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

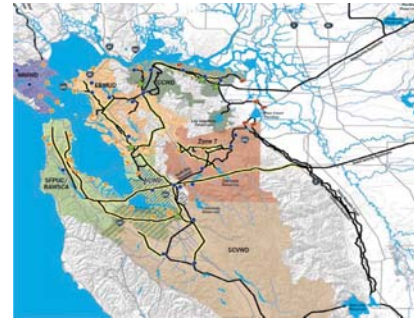
Benefits

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

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

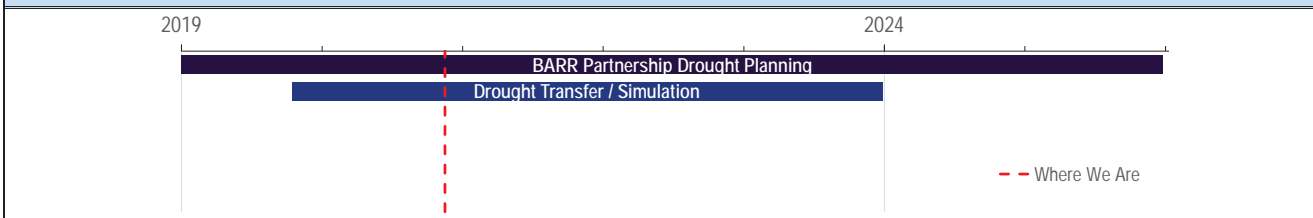
SFPUC Project Manager

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			Institutional Complexity	
Est. Capital Cost:	TBD	Est. Annual O&M:	TBD	SFPUC Only [REDACTED] Multi-Party Partnership
SFPUC Budget Information				Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.
CIP Budget Allocation:	\$0.3M			

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
Conceptual	<ul style="list-style-type: none"> Institutional arrangements / willingness of stakeholders 	<ul style="list-style-type: none"> Encourages regional water supply planning and collaboration Leverages existing infrastructure
18-Month Outlook <ul style="list-style-type: none"> Conduct water transfer simulation through SBA, considering operational, water quality, financial and legal impacts Conduct water quality analysis Prepare draft executable agreement Incorporate stakeholder input in strategy report development 		

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 facilities and reoperation of some facilities. Storage in LVE can provide a dry year water supply benefit to the SFPUC's Regional Water System (RWS). Currently, SFPUC staff are pursuing scenarios of 20,000 - 40,000 acre-feet of storage. In addition, water supply and conveyance to the RWS need to be determined before the SFPUC determines the extent of participation in the LVE project. Conveyance Alternatives, Brackish Water Desalination, and BARR simulation are planning efforts that are linked directly to this project.



Los Vaqueros Reservoir

Project Partners

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

SFPUC Project Manager

Manisha Kothari

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

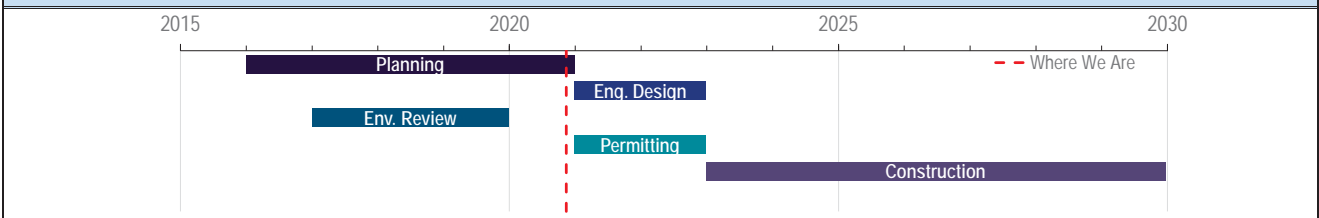
10-Yr CIP Budget Allocation:	\$10.5M	Current Allocation:	\$2.5M
------------------------------	---------	---------------------	--------

Institutional Complexity



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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
Planning; Environmental Review 18-Month Outlook <ul style="list-style-type: none"> Determine feasible conveyance options and constraints Continue participation in Multi-Party Agreement for planning Determine water supply options and constraints Evaluate participation in JPA 	<ul style="list-style-type: none"> Capacity and institutional constraints for conveyance to RWS Firm water supply source Depending on conveyance option, water quality and need for pretreatment 	<ul style="list-style-type: none"> 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

Matt Moses

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
--------------------	-----	------------------	-----

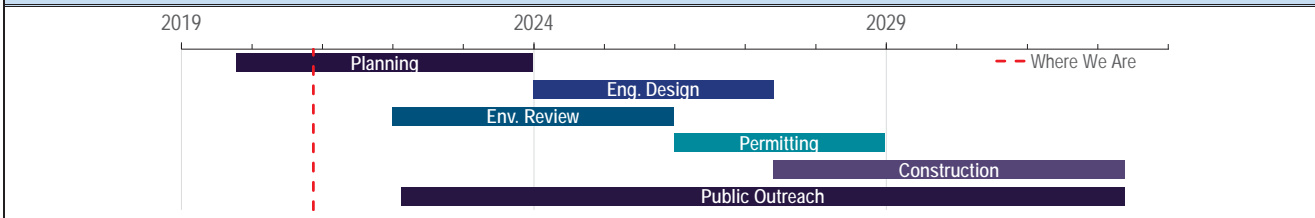
Institutional Complexity

SFPUC Only		Multi-Party Partnership
<small>Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.</small>		

SFPUC Budget Information

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning

18-Month Outlook

- Refine conveyance availability, timing and conditions in coordination with SBA Contractors and DWR
- Prepare memo comparing conceptual alternatives and costs for a new intertie with EBMUD

Risks and Uncertainties

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

Benefits

- Leverages existing infrastructure

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
---------------------------	-----	-----------------------------	-----

Institutional Complexity

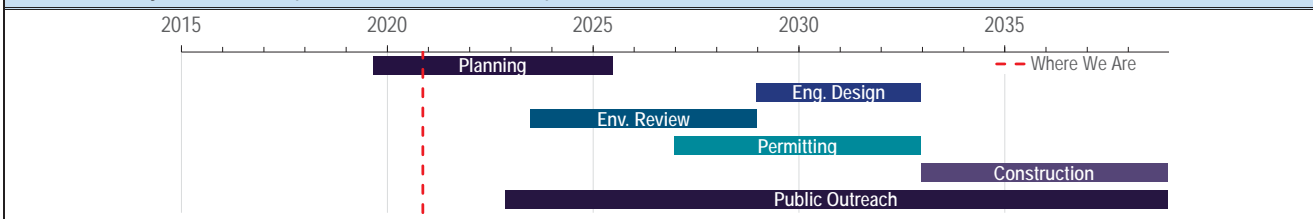
SFPUC Only } Multi-Party Partnership

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

SFPUC Budget Information

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Planning</p> <p>18-Month Outlook</p> <ul style="list-style-type: none"> Feasibility Study underway to determine storage potential and infrastructure needs for four dam raise options (conceptual) Internal review of water supply availability and conveyance options 	<ul style="list-style-type: none"> Availability of additional water from the Tuolumne River to divert to storage 	<ul style="list-style-type: none"> Provides operational flexibility, particularly in dry years Increases storage capacity in the SFPUC's largest reservoir Increases utilization of Tuolumne River and other wet/normal year supply

Groundwater Banking

Project Description

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



Irrigation in MID service area

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

Project Partners

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

SFPUC Project Manager

Ellen Levin 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
---------------------------	-----	-----------------------------	-----

Institutional Complexity

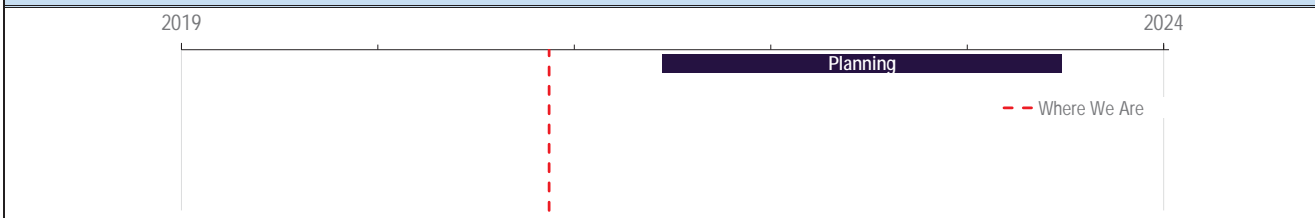
SFPUC Multi-Party Partnership

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

SFPUC Budget Information

CIP Budget Allocation:	\$0.0M		
-------------------------------	--------	--	--

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Conceptual</p> <p>18-Month Outlook</p> <ul style="list-style-type: none"> Initiate discussions with MID and TID 	<ul style="list-style-type: none"> Institutional challenges relating to water rights and basin management 	<ul style="list-style-type: none"> 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.



Reservoirs on the tributaries to the San Joaquin River

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.

Project Partners

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

SFPUC Project Manager

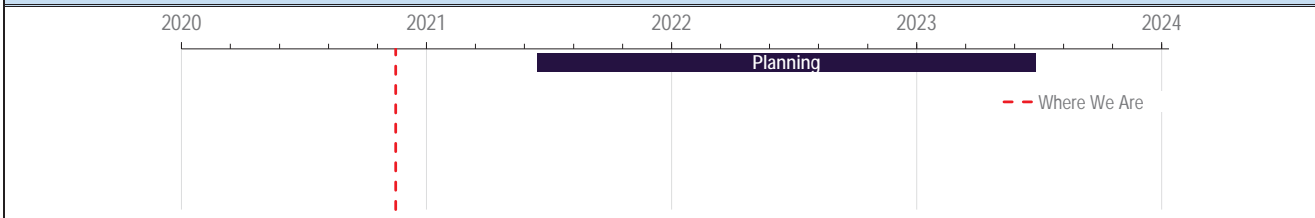
Ellen Levin and Michael Carlin

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

Estimated Project Schedule (Not a Baseline Schedule)



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

Dry Year Transfers - Districts

Project Description

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



Don Pedro Reservoir

Project Partners

SFPUC
Oakdale Irrigation District
Modesto Irrigation District

SFPUC Project Manager

Ellen Levin 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
--------------------	-----	------------------	-----

Institutional Complexity

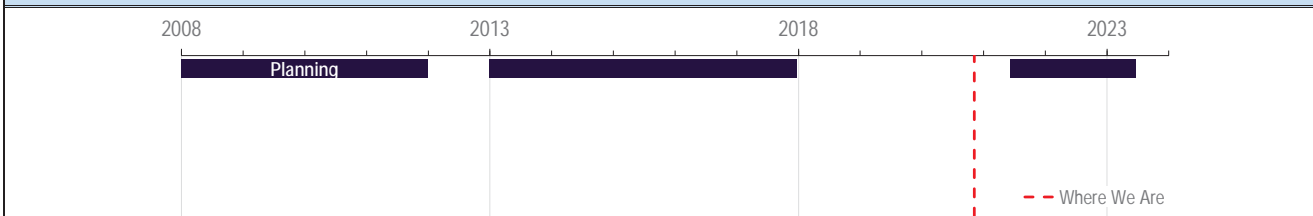
SFPUC Only Multi-Party Partnership

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

SFPUC Budget Information

CIP Budget Allocation:	TBD
------------------------	-----

Estimated Project Schedule (Not a Baseline Schedule)



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

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

In 2018-2019, the SFPUC conducted research and collected data around water quality, process reliability, operations and outreach for purified water opportunities in San Francisco through PureWaterSF. PureWaterSF was a building-scale research project at the SFPUC headquarters in San Francisco that revealed some initial process and operational needs for purified water in San Francisco. A feasibility study will be developed in the coming months to explore the size and scope of purified water opportunities, and to develop a plan for next steps.

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
--------------------	-----	------------------	-----

Institutional Complexity

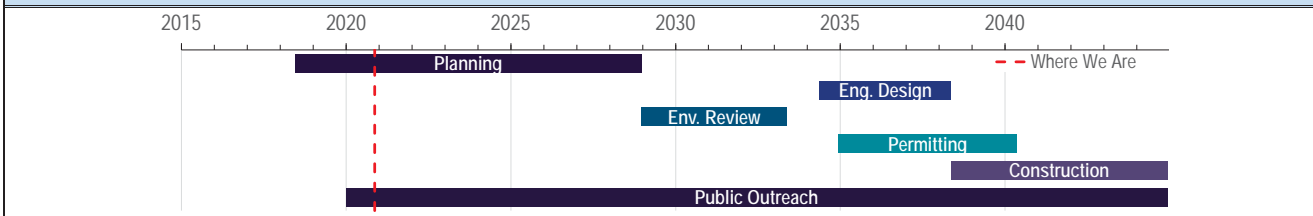
SFPUC Only Multi-Party Partnership

SFPUC Budget Information

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

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

- Initiate feasibility study to explore purified water potential in San Francisco
- Continue research, analysis and outreach efforts on purified water opportunities

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 commercial 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
--------------------	-----	------------------	-----

Institutional Complexity

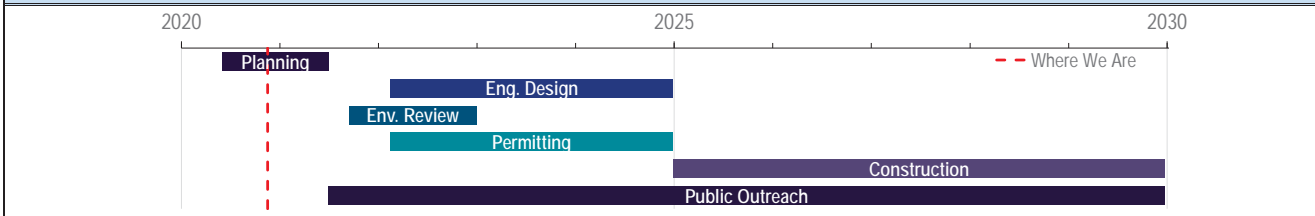
SFPUC Only Multi-Party Partnership

SFPUC Budget Information

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

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

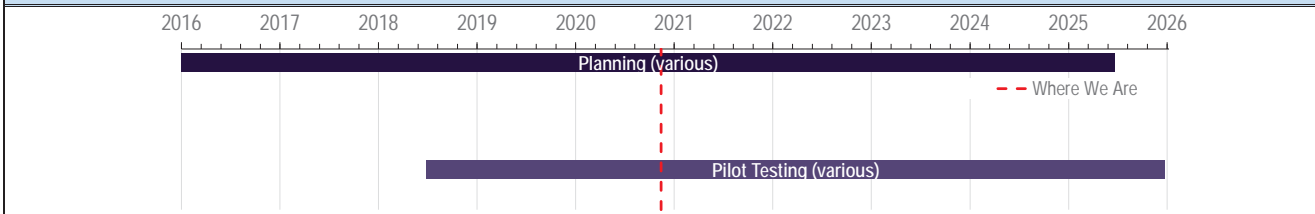
Total Project Cost	Institutional Complexity
--------------------	--------------------------

Est. Capital Cost:	TBD	Est. Annual O&M:	N/A	SFPUC Only Multi-Party Partnership
--------------------	-----	------------------	-----	---

SFPUC Budget Information

CIP Budget Allocation:	\$0.5M	Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.
------------------------	--------	---

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
----------------	-------------------------	----------

Planning; Pilot Testing 18-Month Outlook <ul style="list-style-type: none"> Test alternative leak detection technologies Contract with an atmospheric water generation technology provider to demonstrate a local application in San Francisco. A demonstration will be initiated in the coming months Provide grant support for the implementation of brewery process water 	<ul style="list-style-type: none"> Individual projects may be small, making them costly 	<ul style="list-style-type: none"> Identifies new technology opportunities to increase efficiency and water availability
---	--	---

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 will identify options and potable water thresholds that may result in policy recommendations. The first step in the planning process will be 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

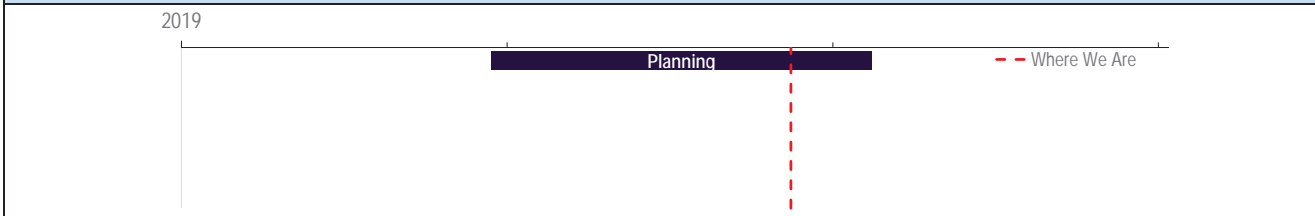
SFPUC Project Manager

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			Institutional Complexity	
Est. Capital Cost:	Not yet known	Est. Annual O&M:	None	
SFPUC Budget Information			SFPUC Multi-Party Partnership <small>Institutional complexity is a relative measure that takes into account project service area, project facilities ownership, number of project partners, cost share, and whether SFPUC is construction and design lead.</small>	
CIP Budget Allocation:	\$0.03M			

Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
Planning 18-Month Outlook <ul style="list-style-type: none"> Evaluate potential to offset potable demand Develop policy recommendations 	<ul style="list-style-type: none"> Cost to developers and/or property owners of implementation 	<ul style="list-style-type: none"> Limits or eliminates demand from new developments

Section 3: Program Background

Planning Priorities and Service 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 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 Level of Service (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.

The current planning effort and the focus of this report 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
SUBTOTAL 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 drought years is 3 mgd

² Estimated environmental flow obligation associated with the Bay Delta Water Quality Control Plan

Ongoing Conservation, Recycled Water and Groundwater Programs

Reducing demand has always been the first line of defense in the SFPUC’s water planning strategy. Despite growth, both retail and wholesale customers maintain active conservation programs. In San Francisco’s retail service area, conservation continues to be a way of life. Retail customers have consistently maintained very low per capita water use. In addition, the SFPUC offers tools such as grants, rebates, educational programs, free consultation services, free devices and leak alerts. As a result, San Francisco maintains one of the lowest residential per capita water consumption rates at 41 gallons per person per day, which is half of the statewide average. To further reduce demand on potable supplies, the SFPUC has pioneered an onsite water reuse program in San Francisco that is helping to keep the largest commercial and mixed use developments significantly off the water grid, reducing the new potable demand for those buildings through mandates, technical assistance, and grant programs.

Since 2008, the SFPUC has been investing in capital projects to bring new supplies totaling approximately 10 mgd online in the retail service area. The SFPUC is constructing the Westside Enhanced Water Recycling Project to provide non-potable water to the largest remaining irrigation users, while partnering with neighboring water and wastewater agencies to realize maximum regional recycled water opportunities. The SFPUC is also implementing both local and regional groundwater projects to produce local drinking water supplies.

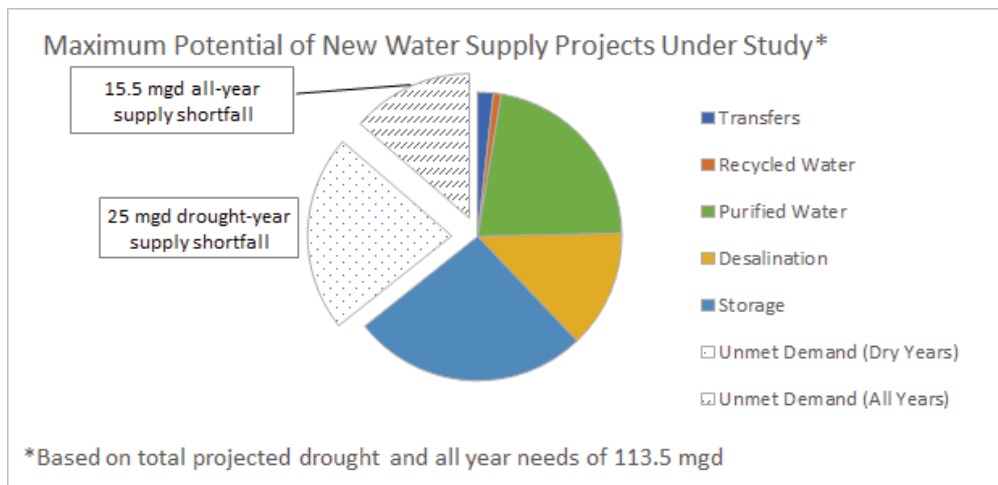
Individual wholesale customers have implemented active conservation programs in their service areas to maintain low per capita use, and are similarly investing in groundwater and water recycling programs to offset potable demands. The SFPUC does not track non-RWS supplies in the

wholesale service area; however, we share best practices and coordinate on planning and messaging through BAWSCA and common planning efforts.

New Alternative Water Supplies

The aforementioned projects that are already in the pipeline were being planned well before the new drought year needs of up to 98 mgd were identified; therefore, they do not count toward meeting our current water supply needs. SFPUC staff continue to seek additional opportunities to increase the potential for conservation, onsite water reuse, and recycled water projects through innovation, policies and partnerships. A number of identified projects directly address these priorities.

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 solutions within the planning horizon. These new water supply options, which are the subject of this report, include expanding storage, groundwater banking, transfers, purified water (potable reuse), desalination, and technological innovations that can increase supply. In addition to the opportunities we have identified and are developing, we are also continuing to seek more options to fully meet our needs. In the context of our planning efforts, new supply categories are described 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 (drought 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 droughts. 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 drought 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 and disinfection, to produce purified water (the product) that meets or exceeds 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.

Many utilities throughout California are considering potable reuse. The SFPUC is considering both regional and in-city projects. Research and analysis are the first steps in understanding and evaluating purified water projects. The three purified water projects being evaluated currently are 1) Crystal Springs Purified Water (PREP), which could produce 6-12 mgd to augment surface water supplies in Crystal Springs Reservoir; 2) Alameda County Water District (ACWD)-Union Sanitary District (USD) Purified Water Partnership, which could produce over 4 mgd. A feasibility study is underway to determine the water supply potential; and 3) San Francisco Purified Water, which could provide up to 5 mgd of purified water in San Francisco. Because this project represents treated water augmentation, which is not yet regulated, additional research and investigation will be required to assess project feasibility.

Unlike dry year transfers or storage projects that can enhance drought supply 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, we continue to seek 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 drought supply reliability.

Planning for Implementation

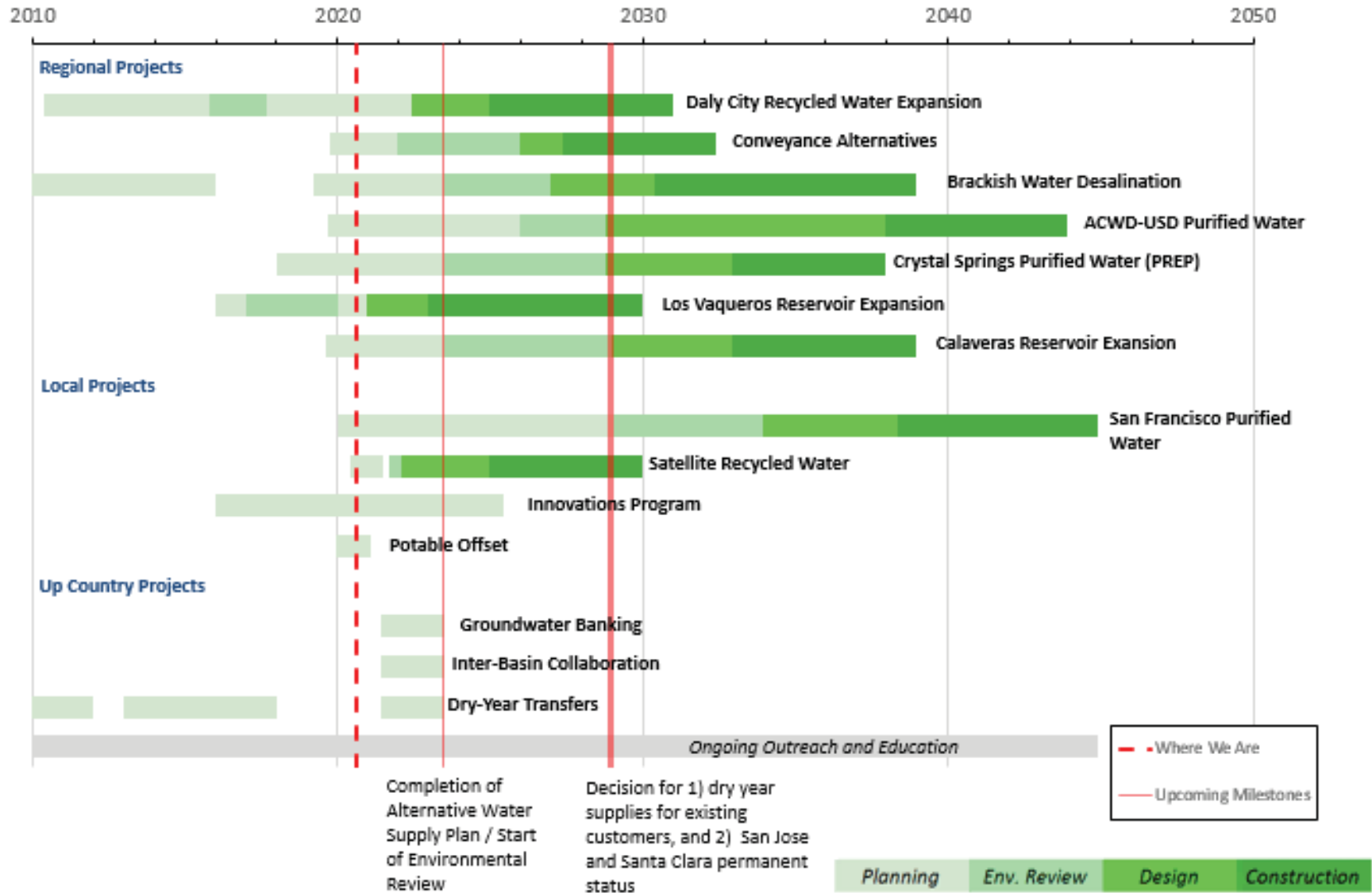
If all the projects identified through the SFPUC's current planning process to date could be implemented, there would still be a supply shortfall of approximately 25% to meet projected demands, and a 35% shortfall to meet drought year demands with San Jose and Santa Clara all-year water supply needs included. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect our ability to implement it. These risks will be described by project in the ensuing pages.

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 during droughts. 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 contained in this report may be augmented over time.

Schedule

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.

Proposed Programmatic Schedule



Staffing

In order to advance the planning for several of these Alternative Water Supply projects expeditiously, the SFPUC is establishing a new group within the Water Resources Division. In February and March of 2020, two new project managers were hired. The timing of their onboarding and plans to hire a manager to supervise this group coincided with the onset of the COVID-19 Shelter in Place order in San Francisco. While recruitment for the supervising position has been temporarily suspended, a senior staff member was designated to serve as Acting Manager to ensure that planning on all projects continues seamlessly. Staff have put in extra effort to ensure that the SFPUC can make significant progress on all planning efforts underway during this time. As a result, no planning activities have been delayed as a result of the current crisis.

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.

Funding and Expenditures

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. However, under the current crisis situation, budgets are being revised and will be submitted before the San Francisco Board of Supervisors for approval on October 1, 2020. During this time, the proposed Capital Improvement Plan budgets are subject to change. While budget revisions are anticipated, expenditures including the time of dedicated staff, time for staff from other SFPUC departments, payments to other agencies for cost sharing of technical studies, and other consultant-supported planning through our as-needed professional services contracts will continue in earnest.

Over the course of the current budget cycle (through Fiscal Year 2021), we expect planning studies to be completed 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.

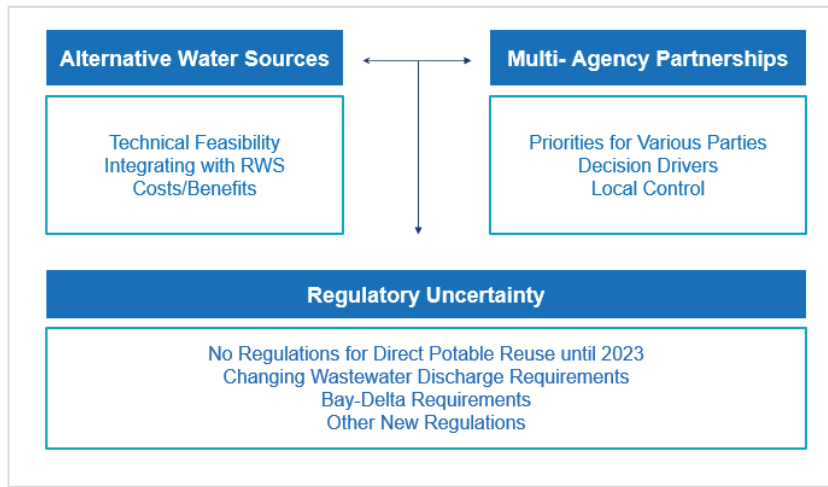
As we enter into MOUs or initiate as-needed contracts, we will report on non-staff costs planned in each quarterly report. Given the lag between encumbering funds and invoicing and because the majority of projects are multi-party partnerships which further exacerbates that lag, we will not be able to report on expenditures in real-time.

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.

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