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June 2, 2020

To: Commissioner Ann Moller Caen, President
Commissioner Francesca Vietor, Vice President
Commissioner Anson Moran
Commissioner Sophie Maxwell
Commissioner Tim Paulson

Through: Harlan L. Kelly, Jr., General Manager

From: Steven R. Ritchie, Assistant General Manager, Water
Paula Kehoe, Manager, Water Resources Division

Re: Water Supply Planning Quarterly Update

Enclosed please find the 3rd Quarterly Alternative Water Supply Planning Report, which provides an update on the status of new regional and local water supply and storage projects that are being planned within the SFPUC's service area.

Collectively, the 15 projects described in this report represent our early planning to meet future water supply challenges and vulnerabilities such as regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As we face future challenges – both known and unknown – we are considering a suite of non-traditional supplies and leveraging regional partnerships to meet our needs through 2045. More than ever, the current COVID-19 crisis underscores the need for a creative and adaptive strategy to continue building resilient water supply infrastructure that relies on supplies from various sources.

The format of this report has changed since previous reports, providing a more comprehensive discussion of each project that is under consideration. This format has been revised based on feedback from BAWSCA. We hope it provides further insight into some of the unique challenges of alternative supply planning. Individual project summaries prepared for prior reports have been updated and are also included in the report.

cc: Nicole Sandkulla, BAWSCA
Tom Francis, BAWSCA

Alternative Water Supply Planning Quarterly Report

June 2020

Overview

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. This report describes 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.

Among the water supply needs before the SFPUC, the most significant is represented by the need to make up for new instream flow requirements on the Tuolumne River. In December of 2018, the State Water Resources Control Board (State Board) adopted amendments to the Bay Delta Water Quality Control Plan (Bay-Delta Plan). For the SFPUC, the effect of this action is a requirement to leave 40% of unimpaired flows in the Tuolumne River to achieve fishery improvements in the Bay-Delta system. SFPUC staff determined that the water supply impact of this new flow requirement in the Tuolumne River would be approximately 93 million gallons per day (mgd) during drought years at our contract levels of demand.

The SFPUC is pursuing litigation against the State Board and is simultaneously seeking a compromise solution through a Voluntary Agreement with the State of California. We are hopeful that this will result in a smaller gap during drought conditions than what is currently anticipated. In the meantime, water supply projects take years and even decades to plan and implement. Complexities of implementing alternative water supply projects can require even longer lead times for planning than traditional water supply projects. Thus, there is an urgency to plan and develop new water supplies that provide drought year reliability so that we can continue to meet our highest priority needs and our Level of Service Goals and Objectives.

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)
Known water supply gaps from prior planning efforts (dry year transfers)	Drought (near-term)	2
Instream flow needs (San Mateo Creek)	Drought (near-term)	3.5
Instream flow needs (Tuolumne River)	Drought (near-term)	93
Other increases in customer demands (anticipated)	All Years (TBD)	*TBD*
San Jose and Santa Clara (historical demand)	All Years *(decision by 2028)*	9
Additional demand from San Jose and Santa Clara	All Years	6.5
TOTAL POTENTIAL DROUGHT NEEDS		***98.5***
TOTAL POTENTIAL ALL YEAR NEEDS (San Jose and Santa Clara)		***15.5***

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
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

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.

Water Supplies in the Pipeline

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.

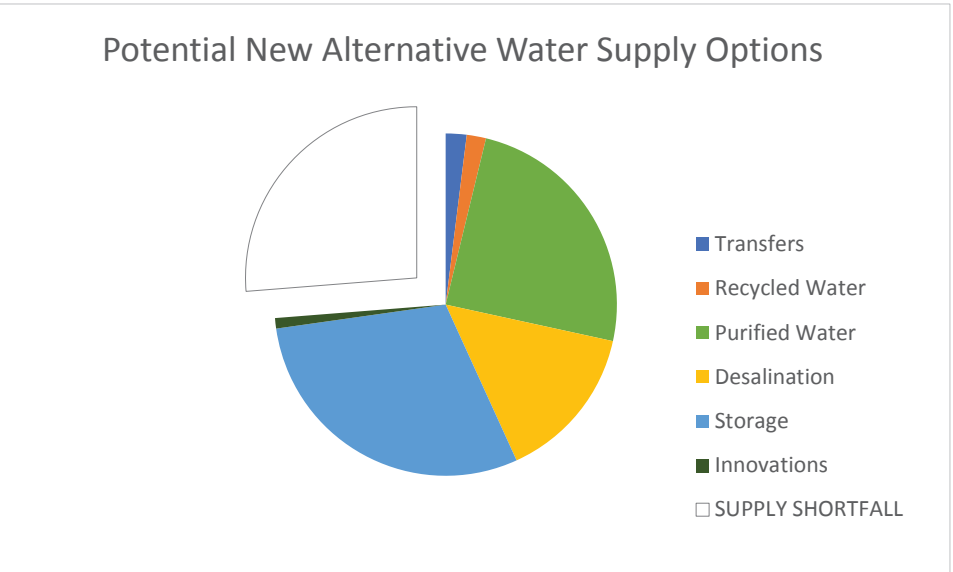
Since 2008, the SFPUC has been investing in capital projects to bring new supplies totaling approximately 10 mgd online in the retail service area. The SFPUC is constructing the Westside Enhanced Water Recycling Project to provide non-potable water to the largest remaining irrigation users, while partnering 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.

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 98.5 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.

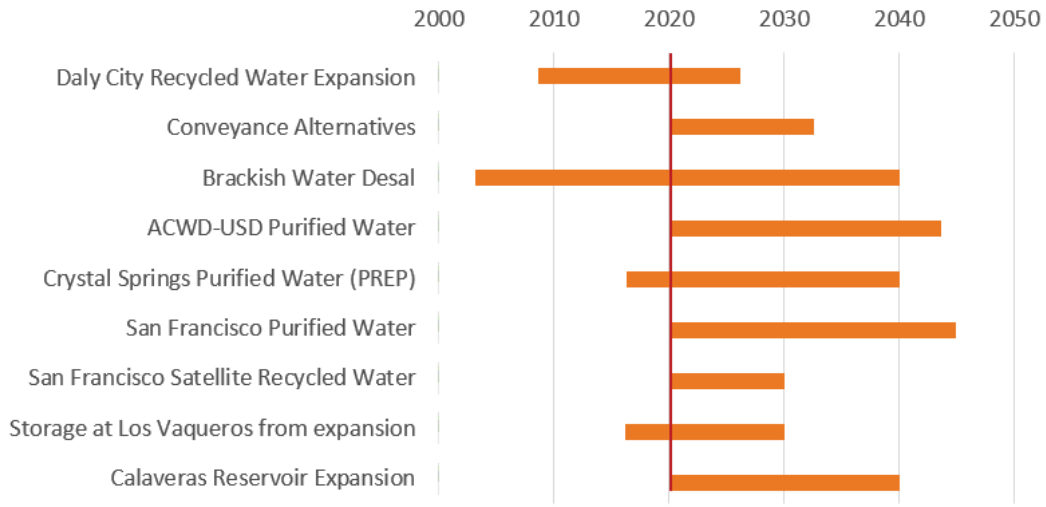
Planning for Implementation

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. 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 to make San Jose and Santa Clara permanent customers by 2028.



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 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 Joint Powers Authority 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.

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

Status of Projects

Staff are currently studying the feasibility of three upcountry, eight regional, and four local projects that can contribute to meeting the needs and priorities identified for this planning effort. These projects represent new upcountry or regional 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.

Upcountry Projects

Groundwater Banking

Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas (collectively, the Districts) 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, which have continued throughout this 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. Progress will depend on the negotiations on the Voluntary Agreement, which have continued throughout 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 OID to secure a similar drought 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.

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 Groundwater 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. 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 GSR Project, which is under construction.

In the past three months, a cost-benefit study was completed under contract with Daly City. The study provides partner agencies with cost information regarding recycled water service to the cemeteries as well as reference costs for the operation of the cemeteries' wells within the South Westside Basin. The study also describes the benefits to all the participating project partners.

Before proceeding with project design, there are two key decision points for the project:

1) How will responsibilities and costs be allocated among the project partners?
2) Are there alternatives that can help mitigate project risks?

To address the first question, the SFPUC and Cal Water have initiated discussions on the potential delivery of recycled water to the prospective customers. As a private water utility, Cal Water would have a different approval process for the project than the SFPUC. In the coming months, the SFPUC, Cal Water and Daly City will continue to determine the terms of cost allocation and roles for project scenarios.

In a parallel effort, SFPUC staff are finalizing a scope of work to compare the relative risks of project alternatives. An example of a project risk is the ability to secure recycled water customers. Through the as-needed contracting vehicle, a consultant will help SFPUC staff develop alternatives to the baseline recycled water project that can potentially reduce some project risks and help protect the South Westside Basin as a reliable and sustainable drought supply (supporting the GSR project).This evaluation will draw on the SFPUC's groundwater basin modeling effort that is currently underway for the GSR Project and help the SFPUC determine the best investment strategy for this project.

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 for 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.

This project highlights the need to engage with the Regional Water Quality Control Board (Regional Board) in planning purified water projects. At the intersection of wastewater discharge and water supply, the Regional Board plays a unique regulatory role. In this reporting period, the project partners met with the Regional Board. The purpose of the meeting was to provide the Regional Board with background on the project and discuss a proposed approach for water quality analysis. The Regional Board expressed an interest in remaining engaged and reviewing the monitoring plan as the project progresses.

Select draft chapters of the feasibility study were also circulated for comment and discussion during this reporting period. The partner agencies continue to refine their needs and systemic constraints. Through regular monthly meetings, the partners coordinate closely on individual and collective interests. This will continue to be a focus of the feasibility analysis in the coming months.

Crystal Springs Purified Water (PREP)

This 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 transmitted 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 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 have been collaborating to develop a scope of work for Phase 3 of the feasibility study. During this past quarter, the SFPUC has coordinated discussions with the consultant (Kennedy Jenks, under contract with SVCW) and partners to reach

agreement on the scope, budget, and cost-share. The SFPUC and partner agencies hope to finalize an agreement and begin work by this summer.

Evaluation of Reuse Opportunities

In 2019, the SFPUC prepared and circulated a survey among wastewater agencies located within our service area to identify any additional water reuse opportunities that have not yet been pursued. Based on the feedback we received, there are four agencies that may have available capacity for additional reuse. However, each of these agencies is pursuing a recycled water and/or purified water project of its own. There do not appear to be additional opportunities for SFPUC participation in reuse at this time. SFPUC staff will continue to track developments and opportunities in the service area; however, no specific follow-up activities are planned as a result of the survey at this time. No additional reporting is anticipated until additional opportunities are identified.

Los Vaqueros Reservoir Expansion

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 Joint Powers Authority that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts.

Storage in LVE can 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 need to 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: Conveyance Alternatives (evaluating conveyance from LVE to RWS facilities), Brackish Water Desalination (potential supply source for exchange and storage in LVE), and the Bay Area Regional Reliability (BARR) Partnership pilot simulation (evaluating potential impacts of conveyance from LVE to San Antonio Reservoir within the RWS and an exchange with ACWD).

In this quarter, CCWD has continued to spearhead the planning for LVE, working toward the formation of a Joint Powers Authority in December of 2020. An independent analysis of CCWD's proposed fee structure was completed by Bartle Wells Associates. Along with other partner agencies, the SFPUC provided comments on the proposed methodology to calculate usage fees. Meanwhile, there are two planned amendments to the Multi-Party

Agreement among partner agencies. The first will be a no-cost extension of the current agreement through December 2020. A second amendment is anticipated to be executed in September 2020 to complete planning through 2021. The estimated cost of the second amendment is $6.8 million to be divided among partner agencies and spread across 4 payments.

The SFPUC and BAWSCA continue to emphasize the importance of conveyance through the State Water Project's South Bay Aqueduct (SBA) as a critical path consideration to determine feasibility of the project for our agencies. The SBA State Water Contractors (ACWD, Zone 7 Water Agency and Valley Water) are participating in the LVE planning and are providing assistance in determining the capacity constraints on the SBA. They are also coordinating with the Department of Water Resources (DWR), the owner of the SBA, to expedite a condition assessment of the SBA. The SFPUC is also coordinating with both ACWD and Valley Water to determine exchange opportunities through the SBA.

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.

Private water operators have expressed interest in developing this project as a public-private partnership. As the participating agencies consider next steps, staff are refining feasible project scenarios. Feasibility will depend in large part on water rights' issues. Staff are working through the BARR Partnership with the assistance of consultant Jerry Johns to evaluate issues associated with water rights. In this reporting period, a memo was prepared, discussed and finalized. Key findings of this work include that 1) the primary water right for the project would be CCWD's existing license and 2) to use the water supply in conjunction with storage at LVE will require an exchange(s) with CCWD, which may have some additional constraints that need to be explored. Additional work on this project is anticipated in the coming months, in conjunction with other BARR efforts.

Conveyance Alternatives

In this project we are exploring the mechanism for a dry year water transfer from LVE to the SFPUC's service area. The volume of water that can be transferred would be the same volume of water that is stored by the SFPUC in LVE. This project will identify and pursue feasible conveyance alternatives so that the SFPUC can realize the benefit of water stored in Los Vaqueros Reservoir. The three conveyance alternatives that will be explored as part of this project using the SBA include 1) a transfer with ACWD; 2) a transfer with Valley Water; and 3) delivery to San Antonio Reservoir. This project is dependent on the SFPUC's participation in the LVE Project. In addition to options off the SBA, this project also considers alternatives for wheeling water through EBMUD using either 1) an existing SFPUC-EBMUD Intertie which would require additional CEQA review and new agreements with EBMUD and Hayward or 2) a new intertie between EBMUD and SFPUC that bypasses the City of Hayward to avoid impacts to Hayward's water supply infrastructure.

As noted in the LVE discussion, there are six major efforts underway that will help the SFPUC evaluate the feasibility of conveyance alternatives:

1) The SBA Contractors are conducting a study of available capacity in the SBA;
2) DWR has prepared a plan for short-, medium-, and long-term repairs to the SBA including geotechnical investigations and a full condition assessment of the existing infrastructure;
3) Under the auspices of BARR, staff from SFPUC, ACWD, and BAWSCA are simulating a transfer of water from LVE to San Antonio Reservoir along with an exchange with ACWD;
4) SFPUC, BAWSCA and Valley Water are coordinating to evaluate a potential exchange scenario between SFPUC and Valley Water using the existing intertie at Milpitas;
5) SFPUC has engaged a consultant to develop conceptual planning for a new intertie between EBMUD and SFPUC; and
6) EBMUD is developing wheeling cost scenarios, including options for delivery from LVE

During this quarter, there was progress on each of these efforts. A scope was developed and consultant engaged by the SBA Contractors on the capacity study. DWR shared its detailed plans for repairs, and the SFPUC initiated discussions with DWR on potential interconnections to the San Antonio Reservoir. The SFPUC, ACWD, and BAWSCA kicked off the BARR simulation project. The SFPUC brought together various internal departments to begin coordinating discussions around key issue areas. SFPUC staff have also had discussions with EBMUD and Valley Water to advance planning and identify next steps.

Bay Area Regional Reliability Partnership

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 (formerly Santa Clara Valley Water District), 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 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.

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 2020.

Between February and April, staff from SFPUC, ACWD and BAWSCA began outlining the concept for the simulated transfer concept through the SBA. In April, the SFPUC held a kick-off meeting to begin coordination among different departments from within the SFPUC to identify key issues that will need to be evaluated over the next year.

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 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.

During this reporting period, the SFPUC engaged AECOM to conceptualize four options to raise the dam elevation. This initial feasibility study is underway. Meanwhile, SFPUC staff are reviewing water supply availability and conveyance constraints. Additional evaluation is forthcoming in the next reporting period.

Local Projects

San Francisco Purified Water

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 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.

In this reporting period, the SFPUC and its consultant received remaining lab results and prepared a draft report presenting analytical results and a summary of project outreach for PureWaterSF, the initial research effort associated with developing purified water opportunities in San Francisco. Several staff and public tours of the PureWaterSF equipment and operation were also conducted prior to the Shelter in Place order. As the research effort has met its objectives and is concluding, plans to decommission the advanced treatment system are underway. As a follow-up effort, SFPUC staff are collaborating with Ventura Water in southern California. Ventura Water will use decommissioned equipment from PureWaterSF to re-establish their own small-scale demonstration for public outreach and education. The SFPUC and Ventura Water will share best practices and data, and will work together toward ensuring that potable reuse regulations address the challenges of implementing DPR in California.

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) and the Auxiliary Water Supply System (AWSS) (the City's firefighting water system for conflagrations). In this quarter, the SFPUC is

finalizing a scope of work and is engaging a consultant through the as-needed vehicle to initiate the feasibility study.

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 has begun working with an atmospheric water generation technology provider to demonstrate a local application in San Francisco. A demonstration will be initiated once the Shelter in Place order is lifted.

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, SFPUC staff initiated consultant task order to begin planning to evaluate the potential to offset future potable demand.

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.

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

SFPUC Budget Information

CIP Budget Allocation:	$0.0M	

Institutional Complexity

SFPUC — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)

Current Status

Conceptual

18-Month Outlook

- Initiate discussions with MID and TID

Risks and Uncertainties

- Institutional challenges relating to water rights and basin management

Benefits

- Additional storage, with availability in dry years

Inter Basin Collaborations

Project Description

Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology. The Tuolumne system tends to spill more excess flow in wetter years than the Stanislaus, and this excess flow could be shaped and credited to meet Stanislaus system requirements, while New Melones Reservoir in the Stanislaus system is refilling. Then the stored water could be partially used to provide required streamflow to meet Stanislaus and Tuolumne requirements in future dry years.

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

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

Reservoirs on the tributaries to the San Joaquin River

Project Partners

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

SFPUC Project Manager

Ellen Levin and Michael Carlin

General Project Information

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

Total Project Cost

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

SFPUC Budget Information

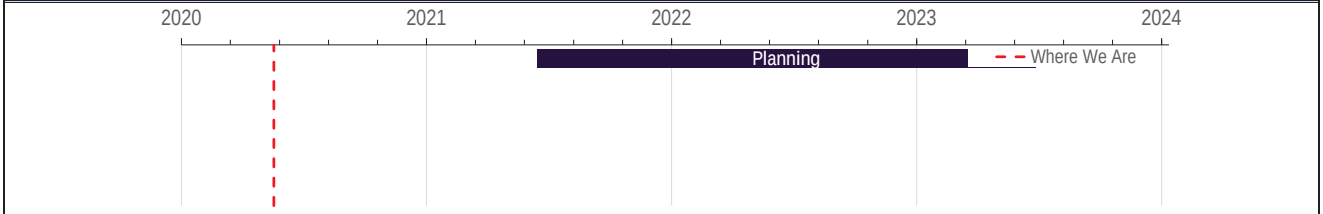
CIP Budget Allocation:	N/A	

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Conceptual

18-Month Outlook

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

Risks and Uncertainties

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

Benefits

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

Dry Year Transfers - Districts

Project Description

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

Don Pedro Reservoir

Project Partners

SFPUC
Oakdale Irrigation District
Modesto Irrigation District

SFPUC Project Manager

Ellen Levin and Michael Carlin

General Project Information

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

Total Project Cost

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

SFPUC Budget Information

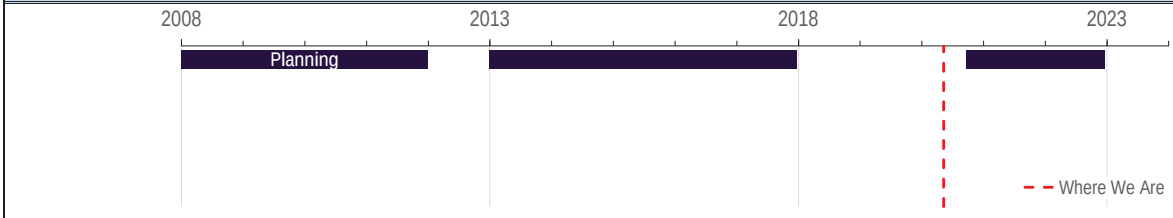
CIP Budget Allocation:	TBD	

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Conceptual

18-Month Outlook

- Resume discussions with Districts

Risks and Uncertainties

- Institutional arrangements / willingness of stakeholders
- Availability of supply

Benefits

- Leverages existing supply and existing infrastructure

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, offseting 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
1.25 mgd	Drought and All Years	Recycled Water / Groundwater Offset	Regional	$6,000

Total Project Cost

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

SFPUC Budget Information

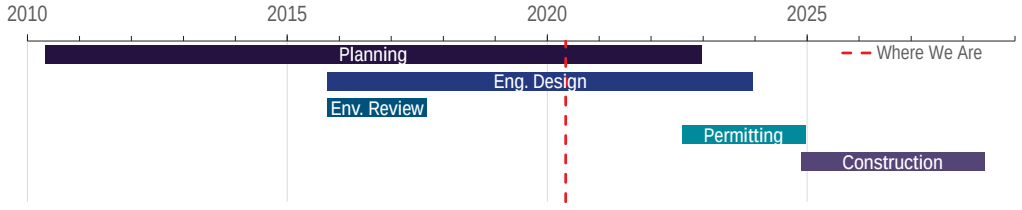
CIP Budget Allocation:	$85.0M

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning; Design Contracting

18-Month Outlook

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

Risks and Uncertainties

- Securing customers (cemeteries and others)
- Partner buy-in and involvement
- Finalizing and procuring storage tank location
- Realizing groundwater offset benefits through GSR
- Loss of 1-2 SFPUC retail customers, dependent on negotiations with partners

Benefits

- Reducing reliance of cemeteries on groundwater pumping for irrigation will increase the reliability of the Southwest Groundwater Basin for drinking water supply
- Recycled water supply may be available for additional customers (to be identified)
- Diversifying water supply portfolio
- Replace some potable water used for irrigation with recycled water (0.05 mgd)

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

Project Description

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

Quarry Lakes, Alameda County

Project Partners

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

SFPUC Project Manager

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

SFPUC Budget Information

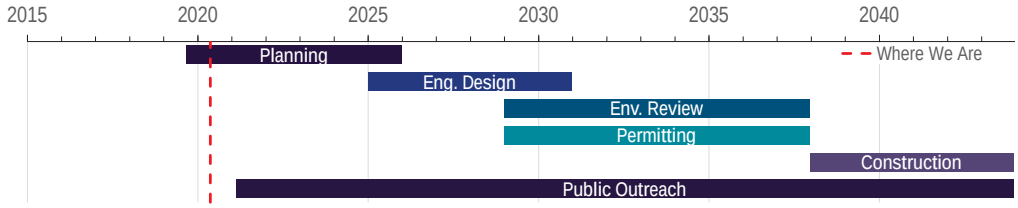
CIP Budget Allocation:	$3.5M

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning

18-Month Outlook

- 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

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
6-12 mgd	All Years	Purified Water	Regional	TBD

Total Project Cost

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

SFPUC Budget Information

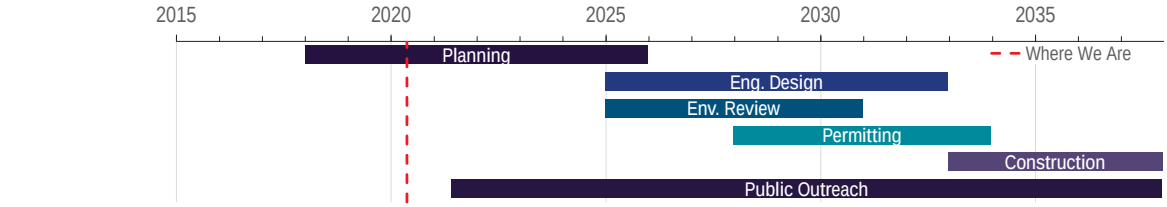
CIP Budget Allocation:	$2.5M

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning

18-Month Outlook

- Continue analysis of impacts of new water supply into Crystal Springs Reservoir
- Identify and evaluate Direct Potable Reuse opportunities

Risks and Uncertainties

- Operational and water quality challenges in Crystal Springs Reservoir
- Construction challenges in parts of distribution area
- Water supply during non-drought years would impact operations and storage availability in the Regional Water System

Benefits

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

Los Vaqueros Reservoir Expansion

Project Description

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

Los Vaqueros Reservoir

Project Partners

Alameda County Water District (ACWD), the Bay Area Water Supply and Conservation Agency (BAWSCA), the City of Brentwood, 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:	$1.3B	**Est. Annual O&M:**	TBD

SFPUC Budget Information

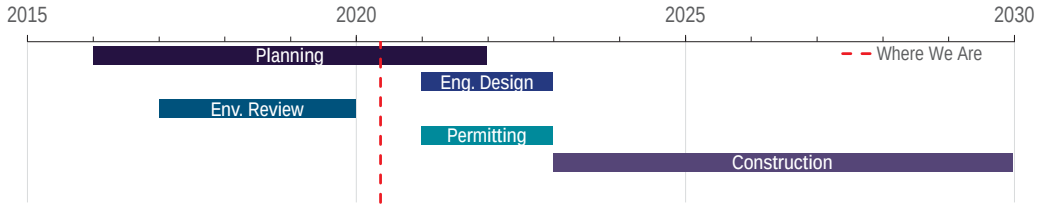
CIP Budget Allocation:	$4.0M	

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning; Environmental Review

18-Month Outlook

- Determine feasible conveyance options and constraints
- Continue participation in Multi-Party Agreement for planning
- Determine water supply options and constraints
- Evaluate participation in JPA

Risks and Uncertainties

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

Benefits

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

Updated as of 5/18/2020

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
~ 5 MGD (TBD)	Dry Years (with storage) and/or All Years	Desalination / Transfers	Regional	TBD

Total Project Cost

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

SFPUC Budget Information

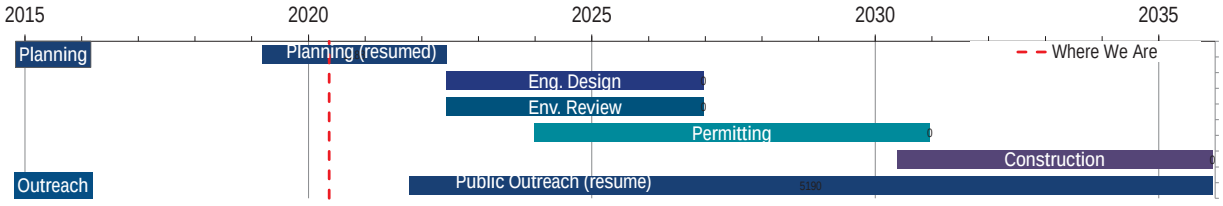
CIP Budget Allocation:	$2.5M

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning

18-Month Outlook

- Develop 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

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

SFPUC Budget Information

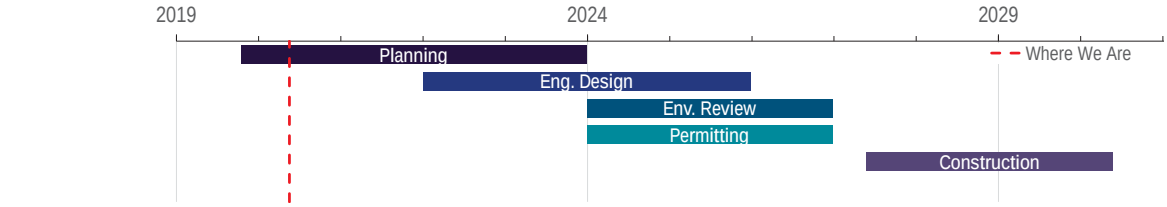
CIP Budget Allocation:	$2.0M	

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Conceptual

18-Month Outlook

- Memo summarizing alternatives
- Evaluate likelihood that South Bay Aqueduct will provide conveyance (through coordination with State and SBA Contractors, and through BARR simulation project)
- Identify 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

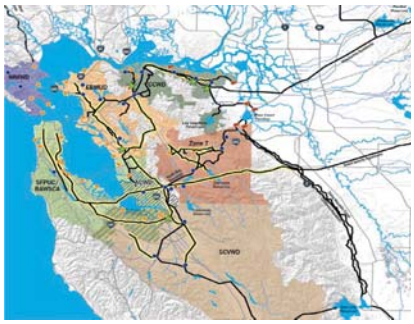
Benefits

- Leverages existing infrastructure

Bay Area Regional Reliability (BARR) Partnership

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 so that future transfers can be implemented more readily in times of drought or emergency. 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 the 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	Transfer	Regional	TBD

Total Project Cost

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

SFPUC Budget Information

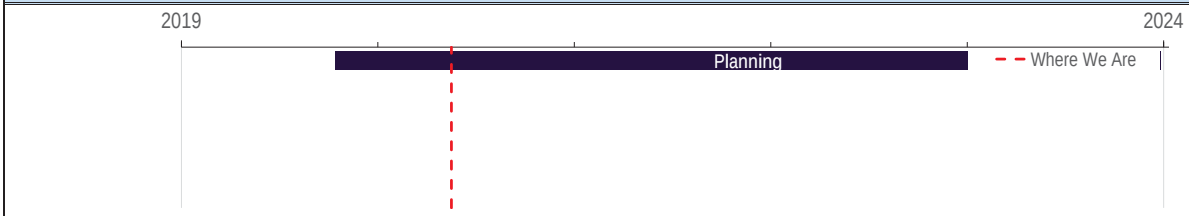
CIP Budget Allocation:	$0.3M

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Conceptual

18-Month Outlook

- Initiate water transfer simulation through SBA, considering operational, water quality, financial and legal impacts
- Prepare draft executable agreement for transfer
- Prepare technical memo describing issues and opportunities for transfer

Risks and Uncertainties

- Institutional arrangements / willingness of stakeholders

Benefits

- Encourages regional water supply planning and collaboration
- 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

SFPUC Budget Information

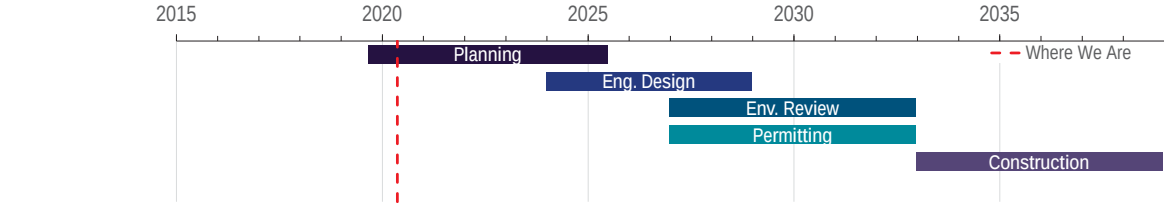
CIP Budget Allocation:	$2.5M

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning

18-Month Outlook

• 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

Risks and Uncertainties

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

Benefits

• Provides operational flexibility, particularly in dry years
• Increases storage capacity in the SFPUC's largest reservoir
• Increases utilization of Tuolumne River and other wet/normal year supply

Updated as of 5/18/2020

San Francisco Purified Water

Project Description

The San Francisco Purified Water Project is a concept that envisions providing approximately 5 million gallons per day of new, local drinking water supply in San Francisco. The project would treat secondary effluent sourced from one of San Francisco's wastewater treatment plants through a multi-stage, multi-barrier advanced treatment process to produce water that meets state and federal drinking water standards. The treated water would then be blended at one or more of San Francisco's drinking water reservoirs. This treatment and distribution process is referred to as treated water augmentation, and State regulations are still under development (anticipated by 2023). The SFPUC would have no external partners in developing the project infrastructure, but close coordination with regulators, other utilities contemplating similar projects, and our communities will be very important throughout the planning and development of this project.

Southeast Treatment Plant

Before engaging in project planning, SFPUC is conducting extensive research and data collection around water quality and process reliability for purified water opportunities. In 2018-2019, SFPUC operated a building-scale research project at its headquarters in San Francisco (PureWaterSF). Data revealed that the treatment processes operated as anticipated. Additional, larger-scale research is needed. Additionally, there are needs for operating training and public outreach before SFPUC will consider engaging in the development of a project.

Project Partners

SFPUC only

SFPUC Project Manager

Manisha Kothari

General Project Information

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

Total Project Cost

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

SFPUC Budget Information

CIP Budget Allocation:	$0.5M	

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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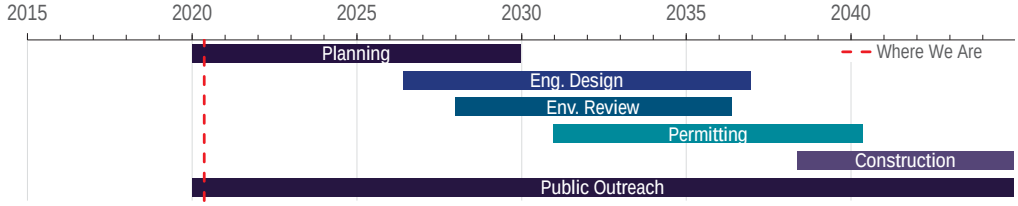
Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Research / Conceptual

18-Month Outlook

- 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

Updated as of 5/18/2020

Satellite Recycled Water (including AWSS)

Project Description

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

Rendering of Chase Center in San Francisco

Project Partners

SFPUC only

SFPUC Project Manager

Taylor Chang

General Project Information

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

Total Project Cost

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

SFPUC Budget Information

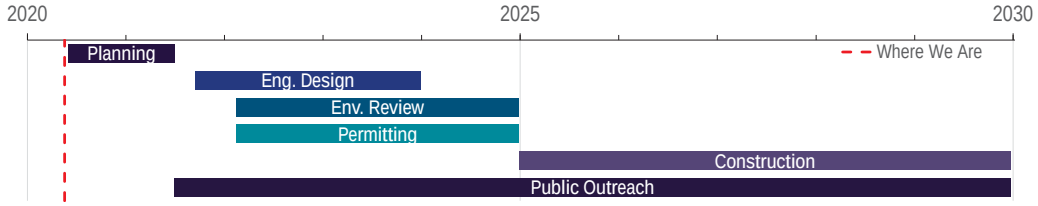
CIP Budget Allocation:	$0.3M	

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Conceptual

18-Month Outlook

- Initiate consultant Task Order for Feasibility Study
- Complete work for dual-plumbed and irrigation plumbed property verification and Recycled Water Satellite Facilities Study

Risks and Uncertainties

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

Benefits

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

Innovations Program

Project Description

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

Fog on Golden Gate Bridge

Project Partners

Various

SFPUC Project Manager

Paula Kehoe

General Project Information

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

Total Project Cost

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

SFPUC Budget Information

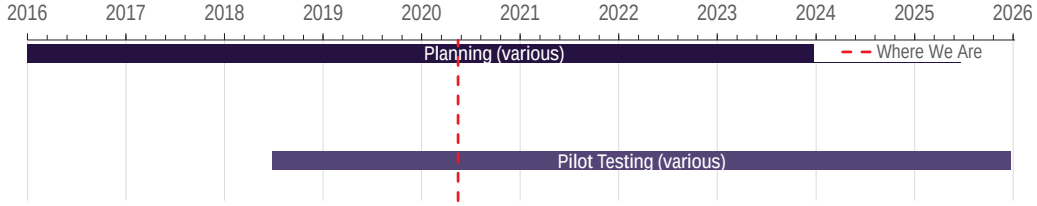
CIP Budget Allocation:	$0.5M

Institutional Complexity

SFPUC Only — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning; Pilot Testing

18-Month Outlook

- Test alternative leak detection technologies
- Evaluate atmospheric water generation technology potential
- Provide grant support for the implementation of brewery process water reuse

Risks and Uncertainties

- Individual projects may be small, making them costly

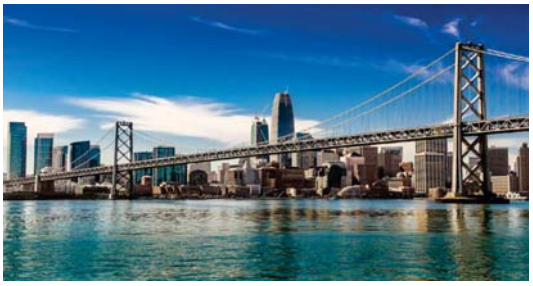
Benefits

- Identifies new technology opportunities to increase efficiency and water availability

Potable Offset Potential

Project Description

The purpose of this project is to evaluate the potential to offset the incremental water demand associated with large new developments in San Francisco. Through coordination with other City departments such as Planning and the Department of Building Inspection, the SFPUC will identify options and potable water thressholds 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

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

SFPUC Budget Information

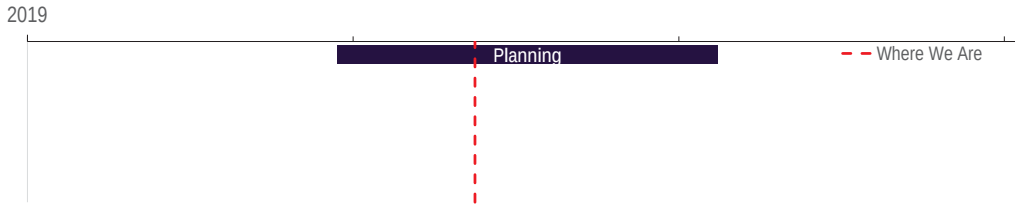
CIP Budget Allocation:	$0.03M	

Institutional Complexity

SFPUC — Multi-Party Partnership

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

Estimated Project Schedule (Not a Baseline Schedule)



Current Status

Planning

18-Month Outlook

- Evaluate potential to offset potable demand
- Develop policy recommendations

Risks and Uncertainties

- Cost to developers and/or property owners of implementation

Benefits

- Limits or eliminates demand from new developments