




September 8, 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

*Steven R. Ritchie*

**Re:** Alternative Water Supply Planning Quarterly Update

Enclosed please find the 4<sup>th</sup> 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. Quarterly updates have been provided since October 2019.

Collectively, the projects described in this report represent our early planning to meet future water supply challenges and vulnerabilities such as environmental flow needs and other 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 this suite of diverse non-traditional supplies and leveraging regional partnerships to meet our needs through 2045. Our planning is focused on developing projects that are adaptive and can be integrated with our existing water supply infrastructure, as we also continue to seek additional supply options.

The format of this report is similar to the last report; however, to avoid redundancy, the background section has been moved to the end of the report, where it has been included for reference. Individual project summaries have been updated, and the report now includes a program level update at the front of the document, which highlights two key topic areas. Every quarter we will focus on different programmatic topics that demonstrate how we think about these planning efforts.

cc: Nicole Sandkulla, BAWSCA  
 Tom Francis, BAWSCA

- London N. Breed**  
Mayor
- Ann Moller Caen**  
President
- Francesca Vietor**  
Vice President
- Anson Moran**  
Commissioner
- Sophie Maxwell**  
Commissioner
- Tim Paulson**  
Commissioner
- Harlan L. Kelly, Jr.**  
General Manager





*Photo: Alameda Watershed, 2013*

# **Alternative Water Supply Planning Quarterly Report**

September 2020

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## Overview

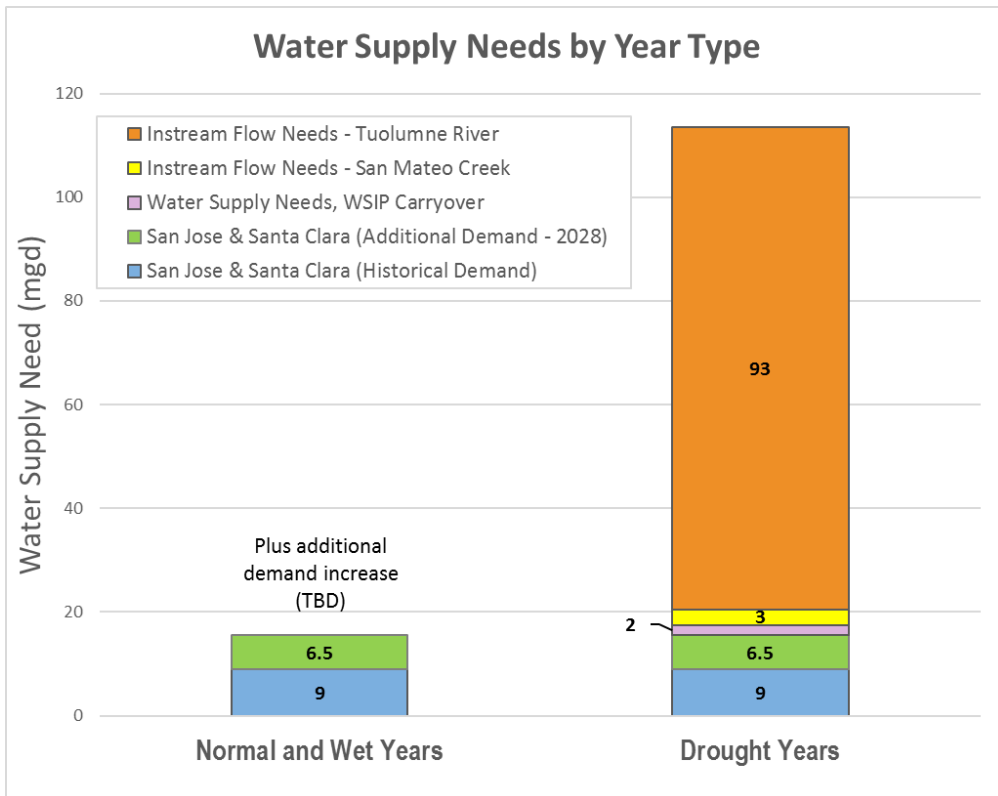
As our water supply needs evolve, the San Francisco Public Utilities Commission (SFPUC) is engaged in a robust planning effort to continue to meet the demands of our customers and the environment. For the current 2045 water supply planning horizon, the SFPUC is looking beyond the traditional surface water supplies of the San Francisco Regional Water System (RWS) and local groundwater sources. This report describes these non-traditional or “alternative” water supply options that are currently being considered such as expanding storage, groundwater banking, transfers, purified water (potable reuse), desalination, and technological innovations and other tools that can increase supply or reduce demand.

Planning for new “alternative” water supply projects presents unique challenges. Preparing for different sources of supply means we have to think carefully about how and where to most appropriately integrate these supplies into an expansive, existing system; it means we could have to re-operate certain parts of our system to accommodate the new supplies; it means understanding new governing regulations, some of which are not yet in place; it means our operators may need additional training and our treatment plants may need to be equipped to handle the new supplies; and it means that we have to enter into complex multi-party agreements with new partners. As we carefully study and plan these projects, we understand that accepting new water supplies can be difficult too, and we are committed to engaging with our customers openly and frequently throughout the process. Taking these aspects of developing alternative water supplies into account, we can expect that these projects will take longer than traditional surface and groundwater supply projects to implement, which can be over a decade. That means our planning process needs to be well underway while we continue to refine our water supply needs. Through this quarterly report, we provide regular updates both at the program and project level to more clearly articulate our planning considerations, the thought process behind the ongoing SFPUC staff efforts, and important decision-making milestones as we consider these new supply opportunities.

The current planning effort and the focus of this report is on meeting the following water supply needs:

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

There are environmental flow obligations, contract requirements, and customer demands that make up the SFPUC’s current water supply needs indicated above. The environmental flow obligation associated with the Bay Delta Water Quality Control Plan (Bay-Delta Plan) requirement to leave 40% of unimpaired flows in the Tuolumne River is the most significant driver of drought demand.<sup>1</sup> SFPUC staff determined that the water supply impact of this new flow requirement would be approximately 93 million gallons per day (mgd) during drought years at our contract levels of demand. For more detail on this and other water supply needs, see the Program Background section of this report.



<sup>1</sup> In 2018, the State Water Resources Control Board (State Board) adopted amendments to the Bay Delta Water Quality Control Plan (Bay-Delta Plan) which, if implemented, would require 40% of unimpaired flows in the Tuolumne River. Although the SFPUC is participating in a lawsuit against the State Board challenging the Bay-Delta Plan Amendment, the SFPUC is simultaneously seeking a compromise solution through negotiation of a Voluntary Agreement with the State of California. We are hopeful that adoption of a Voluntary Agreement would result in a smaller shortfall during drought conditions than that which would result from implementation of the 2018 Plan Amendment.

## **Program Status and Highlights**

Fifteen proposed projects have been identified through the SFPUC's current planning process. Considered collectively, they can provide between 65% and 75% of the projected water supply needs. However, the SFPUC is still in the early stages of planning and significant uncertainties remain. So, the gap between demand and supply may be even wider if one or more projects does not meet its full potential.

In order to bridge the gap, the SFPUC is simultaneously working on 1) refining demands and 2) increasing supply potential. On the demand front, the SFPUC remains committed to finding the best way(s) to balance ecosystem needs in the Bay-Delta while optimizing water supply availability for customers during droughts through voluntary agreement negotiations with the State. SFPUC staff will also review customer demands and purchase requests alongside contract obligations.

On the supply side, SFPUC staff continue to explore all options. Regionally, we have surveyed opportunities for partnerships with wastewater agencies to produce purified water throughout our service area. We actively participate in the Bay Area Regional Reliability (BARR) Partnership with neighboring utilities to find additional drought supply and exchange opportunities. In San Francisco, we support technological innovation such as atmospheric water generation through grants and studies. Building on our innovative Onsite Water Reuse Program, we are studying how we can consolidate clusters of demands to provide decentralized non-potable supplies. We are also thinking about how growing demands associated with new developments can be reduced or neutralized.

While these planning efforts can result in some incremental water supply benefits, opportunities to provide large volumes of potable water that can meet projected needs during droughts are scarce. Above- and below- ground storage, purified water and desalination offer the best potential for sizable new water supplies that can be available during droughts. In the coming months, SFPUC staff will focus additional efforts on identifying new projects that expand these resource areas to develop additional water supply potential.

### ***Coordination with BAWSCA***

BAWSCA represents approximately two-thirds of our customers and coordination between our agencies is an important part of the planning process. SFPUC staff work closely with BAWSCA on these alternative water

supply projects. In addition to this quarterly report, BAWSCA receives monthly updates on the status of some regional water supply projects. For others, including the Los Vaqueros Reservoir Expansion Project, Crystal Springs Purified Water Project (PREP), and the BARR Partnership, BAWSCA attends meetings alongside SFPUC staff and we meet regularly to discuss project details.

***San Jose and Santa Clara***

The Cities of San Jose and Santa Clara are interruptible customers of the SFPUC, and the SFPUC’s agreement with the Wholesale Customers allows the SFPUC to issue a conditional notice of termination of supply to San Jose and Santa Clara if sufficient long-term water supplies from the RWS are not available. For San Jose and Santa Clara to become permanent customers of the SFPUC, an additional 9 mgd of new, year-round supplies would be needed to meet historic demand levels and up to 15.5 mgd would be needed to meet planned demand through 2040.

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

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

Planning of alternative water supplies is proceeding with the intention to be able to make San Jose and Santa Clara permanent customers of the SFPUC. However, consistent with the SFPUC’s planning priorities, the SFPUC must first meet instream flow obligations and identify projects to meet existing obligations to existing permanent customers before making interruptible customers permanent or meeting increased demands of existing and interruptible customers. Distinct from San Jose and Santa Clara’s year-round needs, drought supplies are needed to meet existing obligations.

As SFPUC staff evaluate the technical and institutional feasibility of each of the alternative water supply projects, the timing, availability and location of the

water supply benefits associated with the projects are also being considered. With these criteria, the SFPUC can review projects for their suitability as drought supply for existing permanent customers. If a project is better suited to meeting all-year needs rather than drought-year only needs, it will be considered as a potential source of supply for San Jose and Santa Clara. An example of this could be a purified water project that may need to produce water in all years to be cost-effective. Depending on location and availability, such a project could be better suited to meet San Jose and Santa Clara's needs rather than the drought needs of existing permanent customers alone. Dependent on conveyance, timing, and availability of a new water supply, the Los Vaqueros Reservoir Expansion project may be another project that could serve the needs of San Jose and Santa Clara. As project analyses are conducted, staff will continue to report on these planning considerations.

Meanwhile, BAWSCA has initiated regular discussions with the SFPUC, San Jose and Santa Clara to collectively consider project opportunities and interests. Coordination among staff will help ensure that project planning is appropriate and comprehensive. The first of such meetings was held on August 13, 2020, and future meetings will continue on a monthly basis.

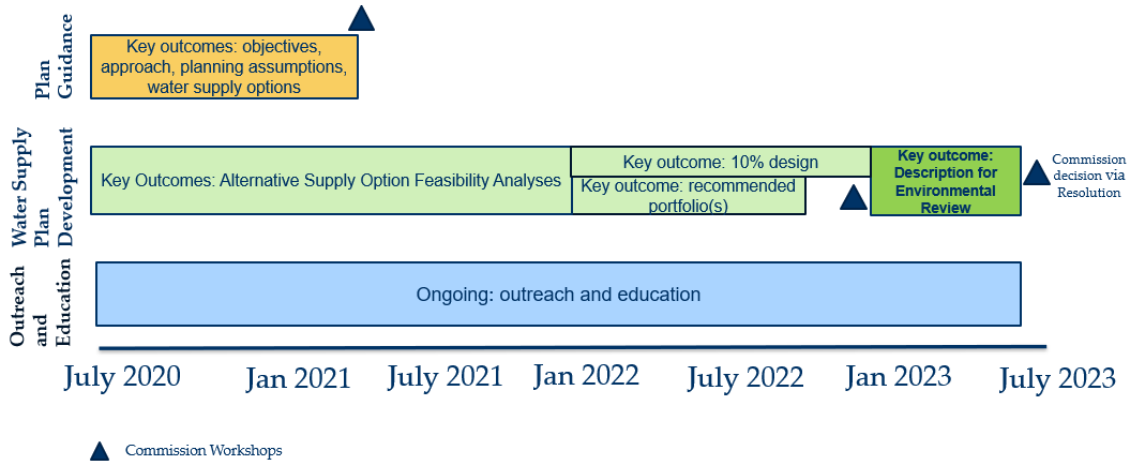
### ***Moving Toward Environmental Review***

As with traditional infrastructure projects, there is a need to progress systematically from planning to environmental review, and then on to detailed design, permitting and construction of these alternative water supply projects. Given the complexity and inherent challenges described in the Overview, these projects will require a long lead time to develop and implement. However, the SFPUC's drought needs may be imminent and decisions to make San Jose and Santa Clara must be made by 2028.

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



## Proposed Water Supply Plan Deliverable Schedule



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

Typically, a minimum of 10 percent design is needed to obtain the level of project detail required to begin preparation of an environmental document. To achieve this, the SFPUC will need to work closely with its partners to complete the feasibility phase of the projects and make decisions about which projects to pursue no later than 2023. The Los Vaqueros Reservoir Expansion (LVE) Project is an exception to this schedule because of external project drivers. In this case, the SFPUC will need to decide whether to continue to participate in planning and design in September of 2020 and whether to participate in the broader project implementation by December 2021. SFPUC staff are working toward having necessary project planning information and Plan guidance in place in time for the Commission to make an informed decision.

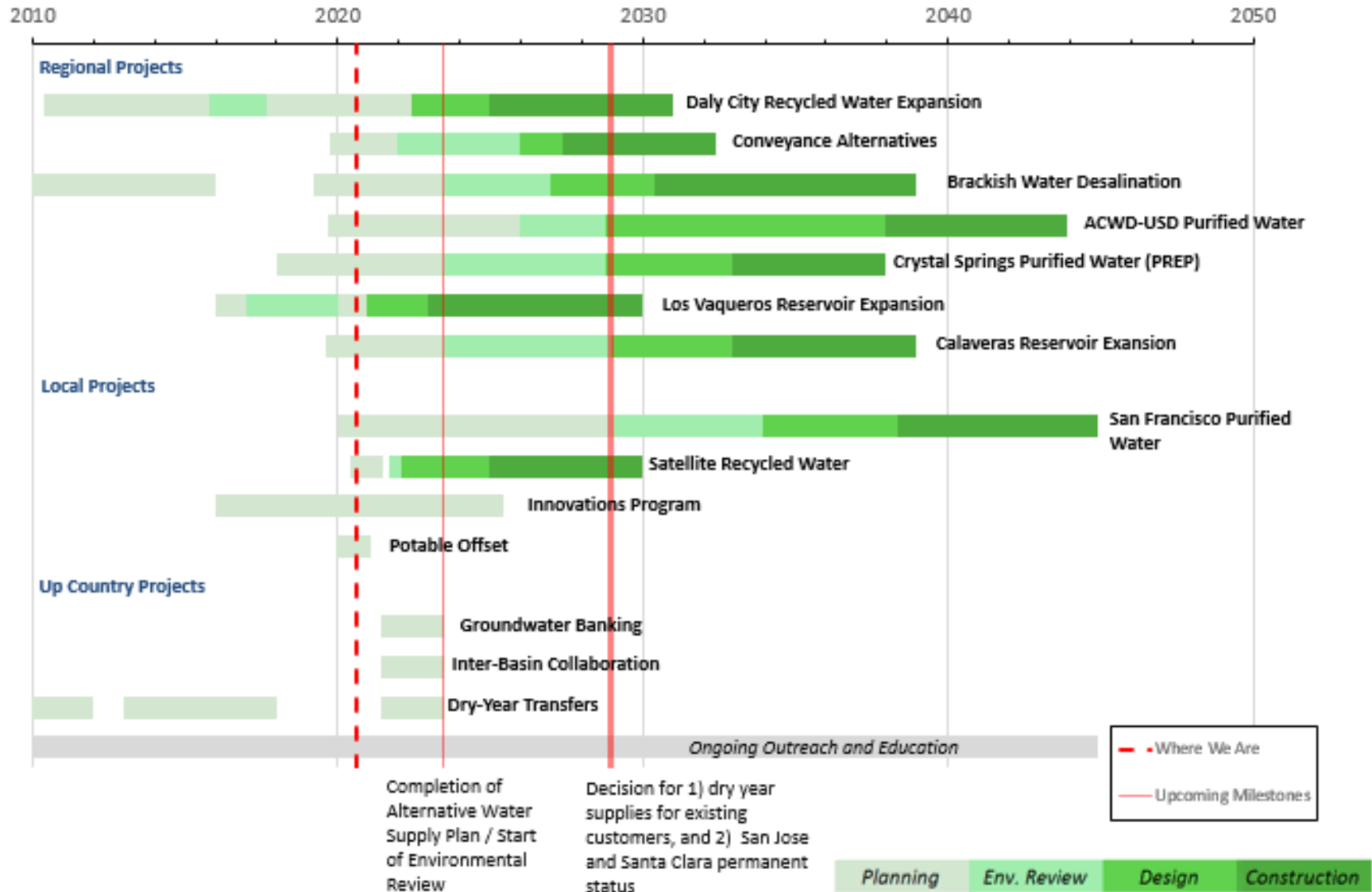
A table breaking out the project phases and estimated completion dates is shown below. On the next page, an overlay of the various project schedules is shown to demonstrate how the key milestones will align with the planning process.

Alternative Water Supply Project Status							
	Planning		Env. Review	Design			Construction
	Technical Feasibility	Institutional Feasibility		10% Design	Full Design	Permitting	
<b>Regional Projects</b>							
Daly City Recycled Water Expansion	✓	2023	✓	✓	2025	2029	2031
Conveyance Alternatives	2022	2024	2024	2022	2027	2029	2032
Brackish Water Desalination	✓	2025	2029	2023	2030	2036	2039
ACWD-USD Purified Water	2023	2028	2029	2026	2038	2038	2044
Crystal Springs Purified Water (PREP)	✓	2027	2029	2024	2033	2034	2038
Los Vaqueros Reservoir Expansion	✓	2021	✓	✓	2023	2023	2030
Calaveras Reservoir Expansion	2023	2025	2029	2026	2033	2033	2039
<b>Local Projects</b>							
San Francisco Purified Water	2023	2029	2033	2030	2038	2040	2045
Satellite Recycled Water	2021	2021	2023	2022	2025	2025	2030
Innovations Program	✓	2025	N/A	N/A	N/A	N/A	N/A
Potable Offset Potential	✓	2021	N/A	N/A	N/A	N/A	N/A
<b>Up Country Projects</b>							
Groundwater Banking	○		N/A	N/A	N/A	N/A	N/A
Inter-Basin Collaboration	○		N/A	N/A	N/A	N/A	N/A
Dry-Year Transfers	✓	○	N/A	N/A	N/A	N/A	N/A

Complete	✓
Underway	○
Estimated completion date	20XX

# Proposed Programmatic Schedule



## **Program Trends and Risks**

Each regional alternative water supply project, apart from the Calaveras Reservoir Expansion Project, involves multi-agency partnerships with institutional complexities. Due to jurisdictions over water sources or infrastructure, the SFPUC relies on our partner utilities to move forward. Therefore, the priorities and constraints of partner agencies will factor into project feasibility, cost, and schedules.

In addition, regulatory uncertainties pose a risk for some of the projects, particularly for those with direct potable reuse (DPR) components. 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. In the absence of clear regulatory guidance, projects with DPR components are at risk due to uncertainties.

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

In this quarter, to address the questions above, SFPUC staff have held several meetings with Cal Water and Daly City to discuss each agency's potential roles and responsibilities, as well as discuss a schedule for a recycled water project. As a private utility, Cal Water's participation is further subject to review by the California Public Utilities Commission. As Cal Water contemplates its role in the project, it is conducting a reliability study that will include review of the costs and benefits of this project over the coming year. The partner agencies will continue to coordinate regularly as roles, responsibilities and relative cost-shares are defined for this project.

Meanwhile, SFPUC staff have finalized the scope of work to develop and evaluate alternatives to the baseline recycled water project. The study will evaluate the feasibility and cost of other project scenarios that with potentially lower risks, but can also help protect the South Westside Groundwater Basin as a reliable and sustainable drought supply. Modeling of the South Westside Groundwater Basin will help inform the potential water supply benefits associated with these alternatives, in conjunction with the GSR 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 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.

The approach to planning for this project has been that the consultant team prepares individual draft chapters of the Feasibility Study for review and discussion by the partners. Chapters completed so far include information on individual agency needs and constraints and regulatory framework. A chapter on lessons learned from other projects is currently underway. In the last quarter, there was also a meeting with the Regional Board, which demonstrated the need for a robust Monitoring Plan to evaluate water quality data for purified water potentially entering Quarry Lakes. As interim deliverables are provided and meetings are held, elements of strawman alternatives are emerging for further evaluation in the latter part of the study (which is scheduled to begin in late 2020). The goal of the study is to identify and evaluate feasible alternatives to provide the maximum potential purified water from the project.

### *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 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 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 have been collaborating to develop a scope of work for Phase 3 of the feasibility study. In this past quarter, the SFPUC and partners finalized the Phase 3 scope of work

and budget. The partner agencies are currently reviewing a draft Memorandum of Agreement in order to commence Phase 3 in the next quarter. As part of Phase 3, in addition to the technical analysis of the project, staff from the partner agencies will develop a framework for continued cooperation and cost sharing, and they will collaborate to develop a Fact Sheet to begin public outreach.

### *Los Vaqueros Reservoir Expansion*

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. 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 (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 pilot simulation (evaluating potential impacts of conveyance from LVE to San Antonio Reservoir within the RWS and 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.

The following have been the recent areas of focus for the LVE project:

**The Joint Powers Authority Agreement:** In this quarter, CCWD has continued to spearhead the planning for LVE, as SFPUC staff, legal counsel, and senior management are working with other partners to draft the JPA agreement.

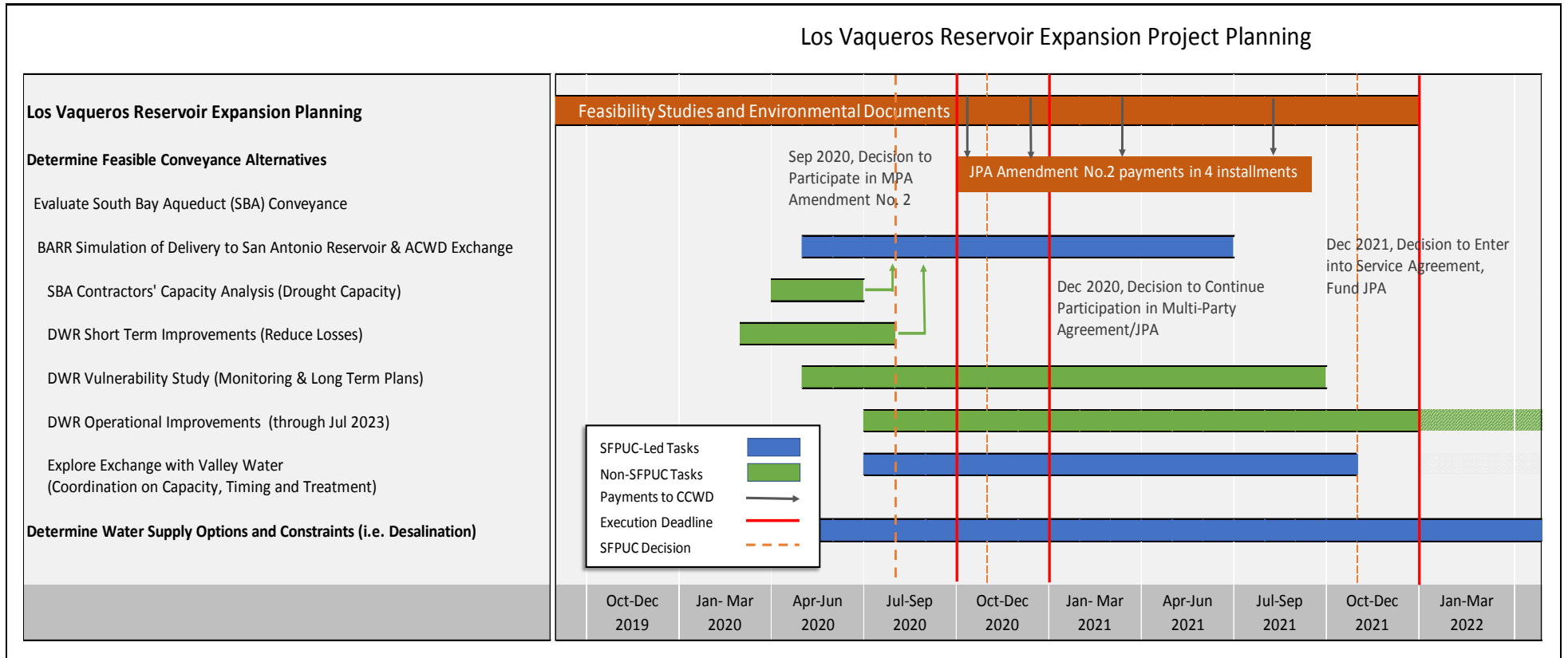
**LVE Cost Share Agreement:** A new cost share proposal was put forward by the CCWD team in June 2020. The SFPUC team, along with other partner agencies, deliberated on the proposed methodology to calculate usage fees and provided coordinated comments to CCWD. A second review and analysis of CCWD's June 2020 proposed fee structure is underway.

**First Amendment to the Multi Party Agreement:** The first amendment to the Multi-Party Agreement (MPA), which is a no-cost extension of the current planning agreement through December 2020 was approved and executed by the SFPUC in June 2020.

**Second Amendment to the Multi Party Agreement:** In late July 2020, CCWD shared a draft second amendment to the MPA with the partner agencies. The 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 or up to \$1 million per agency. BAWSCA is currently determining whether it will continue to be an independent partner in this phase of work. If not, the SFPUC will continue to represent the needs of all its customers and work closely with BAWSCA.

An overall Project schedule for studies related to the decision-making for the LVE project is shown below to indicate key milestones within the planning process.

## Proposed Schedule for Elements that Support SFPUC's Decision-Making for Participation in the Los Vaqueros Reservoir Expansion 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.

Private water operators have previously expressed interest in developing this project as a public-private partnership. Last quarter, staff worked with consultant Jerry Johns 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. The exchange pilot is expected to be completed in late 2020. No additional work is anticipated for this project until then.

### *Conveyance Alternatives*

In this project we are exploring the alternate mechanisms for a dry year water transfer from LVE to the SFPUC's service area. The three conveyance alternatives that are included 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.
- 6) EBMUD is developing wheeling cost scenarios, including options for delivery from LVE.

While we are looking at different conveyance opportunities involving significant new infrastructure, the SBA offers maximum opportunities for direct delivery into the RWS using existing infrastructure. Therefore, our primary focus has been on understanding the available capacity and timing of potential deliveries through the SBA, either directly into San Antonio Reservoir and/or via exchange through ACWD or Valley Water.

During this quarter, there were several important developments. The SBA capacity study has been drafted, and we expect the SBA Contractors to share results with the SFPUC and BAWSCA soon. The capacity study will provide key information about when and how much water may be available to the SFPUC from the SBA either directly or via exchange. In conjunction with water supply availability information from LVE and an analysis of the optimal timing for the SFPUC to receive water into San Antonio, we will have a good understanding of the potential water supply benefits of the LVE project through the SBA in the coming months.

In this quarter, SFPUC staff also identified alternative bypass alternatives, connecting to EBMUD's system. That analysis will be carried out in parallel to the SBA analysis. Meanwhile, the SFPUC will continue to coordinate with Valley Water and ACWD on exchange opportunities.

### *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.

In this quarter, the BARR Partnership held two workshops with external stakeholders. Diverse interests were represented and the comments shared will help the BARR Partners develop a more comprehensive strategy in developing drought supply planning opportunities.

For the BARR Pilot 1A simulation, SFPUC staff across divisions met to discuss the scope and objectives for water quality analysis, which has been finalized. A Task Order is being initiated to begin this work in August. SFPUC is also meeting monthly with ACWD and BAWSCA to coordinate tasks including financial considerations associated with potential exchange scenarios.

### *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 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, SFPUC staff began evaluating conveyance alternatives for the project. In the coming months, a scope of work will be developed for a consultant to perform additional feasibility evaluation of pump station and pipeline alternatives to provide conveyance between the Alameda Siphons and Calaveras Reservoir. Meanwhile, a draft study on the potential dam raise concepts is currently under review by staff.

### ***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.

In this reporting period, the SFPUC's initial research referred to as PureWaterSF was completed. A final report was prepared and submitted to the Water Research Foundation, which provided funding in support of the SFPUC's research and lab analysis. The Project findings were presented by SFPUC staff at the annual WaterReuse California conference.

At the end of August, the advanced treatment system was fully decommissioned. Through collaboration with the U.S. Bureau of Reclamation (partner that funded the equipment purchase) and Ventura Water (a utility planning potable reuse supply in their service area), the equipment from PureWaterSF will be used for a demonstration project in southern California in the coming months. Opportunities for joint research and collaboration between the SFPUC and Ventura Water are continuing to be explored.

### *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 SFPUC has approved the consultant's scope of work for the feasibility study and the study is underway.

### *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 received approval to 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.

### *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 has worked with the consultant team to review existing potable offset programs nationally and internally as part of the efforts to evaluate the potential to offset future potable demand.

### ***Project Summaries***

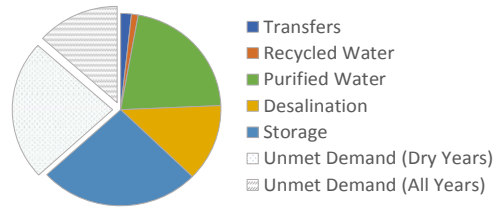
In the following pages, single page summaries of each project are provided, along with current planning and development schedules and additional details of each project included in this program.



## 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

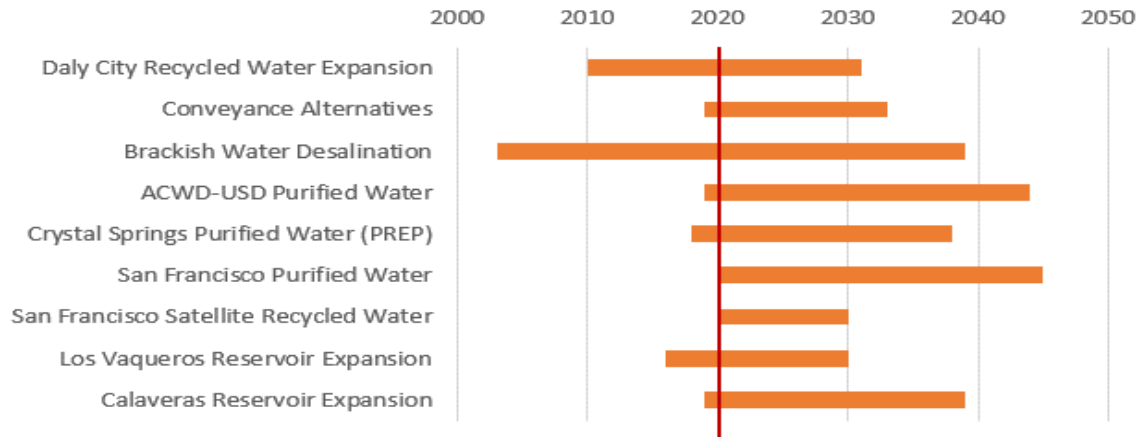
Est. Capital Cost:	TBD	Est. Annual O&M:	TBD

### Capital Cost/Acre-Foot

TBD
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### 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

## 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

<b>Est. Capital Cost:</b>	TBD	<b>Est. Annual O&amp;M:</b>	TBD
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### Institutional Complexity

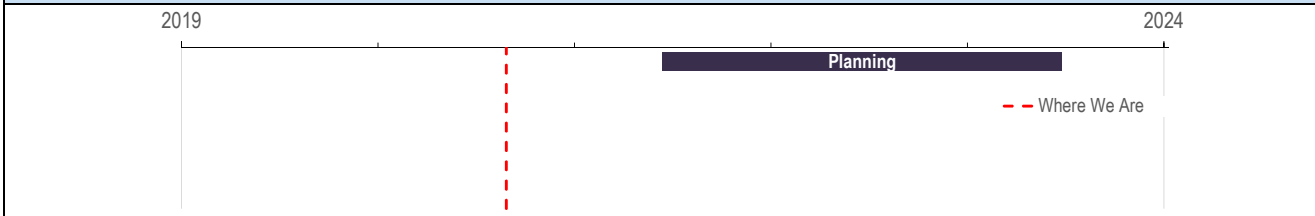
SFPUC  Multi-Party Partnership

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

### SFPUC Budget Information

<b>CIP Budget Allocation:</b>	\$0.0M
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### Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
Conceptual <b>18-Month Outlook</b> <ul style="list-style-type: none"> <li>Initiate discussions with MID and TID</li> </ul>	<ul style="list-style-type: none"> <li>Institutional challenges relating to water rights and basin management</li> </ul>	<ul style="list-style-type: none"> <li>Additional storage, with availability in dry years</li> </ul>

## 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

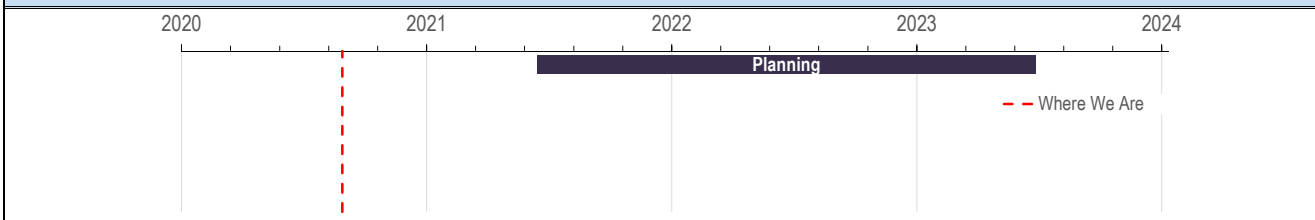
Ellen Levin and Michael Carlin

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

## 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
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### Institutional Complexity

SFPUC Only  Multi-Party Partnership

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

### SFPUC Budget Information

CIP Budget Allocation:	TBD
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### Estimated Project Schedule (Not a Baseline Schedule)



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

## 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

<b>Est. Capital Cost:</b>	\$85.0M	<b>Est. Annual O&amp;M:</b>	\$2.0M
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### Institutional Complexity

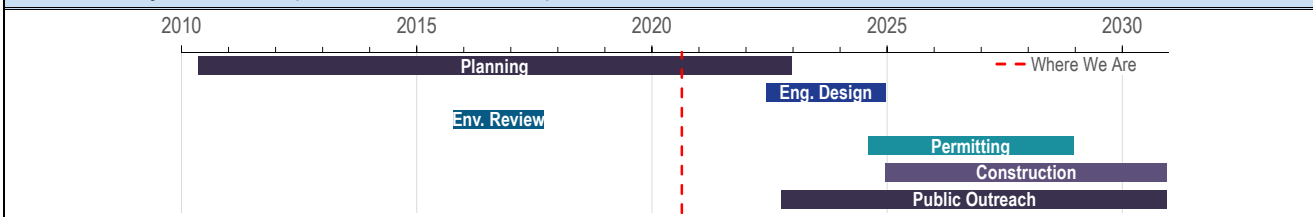
SFPUC Only	Multi-Party Partnership
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### SFPUC Budget Information

<b>10-Yr CIP Budget Allocation:</b>	\$85.0M	<b>Current Allocation:</b>	\$2.5M
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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><b>18-Month Outlook</b></p> <ul style="list-style-type: none"> <li>Identify Project ownership and cost structure among Partners (SFPUC, Daly City, Cal Water)</li> <li>Evaluate project alternatives</li> <li>Develop Term Sheet for project</li> </ul>	<ul style="list-style-type: none"> <li>Securing customers (cemeteries and others)</li> <li>Partner buy-in and involvement</li> <li>Finalizing and procuring storage tank location</li> <li>Realizing groundwater offset benefits through GSR</li> <li>Loss of 1-2 SFPUC retail customers, dependent on negotiations with partners</li> </ul>	<ul style="list-style-type: none"> <li>Reducing reliance of cemeteries on groundwater pumping for irrigation will increase the reliability of the Southwest Groundwater Basin for drinking water supply</li> <li>Recycled water supply may be available for additional customers (to be identified)</li> <li>Diversifying water supply portfolio</li> <li>Replace some potable water used for irrigation with recycled water (0.05 mgd)</li> </ul>

## 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
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### Institutional Complexity

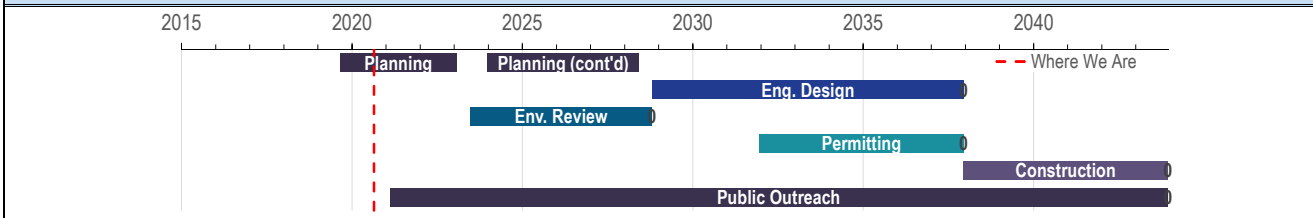
SFPUC Only  Multi-Party Partnership

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

### SFPUC Budget Information

10-Yr CIP Budget Allocation:	\$5.0M	Current Allocation:	\$2.5M
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### Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
Planning <b>18-Month Outlook</b> • Feasibility study underway to identify and analyze purified water (potable reuse) project concepts	• Potential water quality change to Quarry Lakes	• Leverages existing facilities to provide water supply

## Crystal Springs Purified Water

### Project Description

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



*Crystal Springs Reservoir*

### Project Partners

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

### SFPUC Project Manager

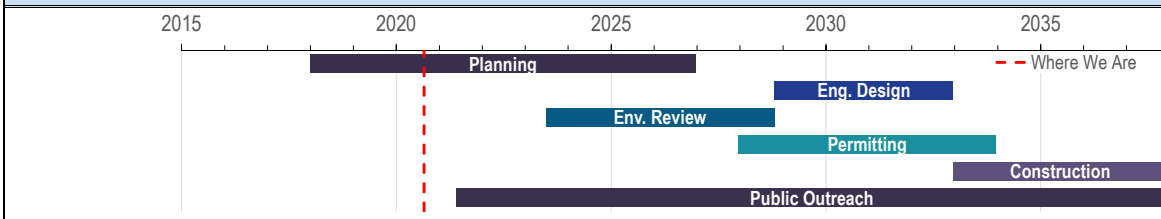
YinLan Zhang

### General Project Information

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

Total Project Cost				Institutional Complexity	
Est. Capital Cost:	TBD	Est. Annual O&M:	TBD	SFPUC Only	Multi-Party Partnership
<b>SFPUC Budget Information</b>				<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>	
10-Yr CIP Budget Allocation:	\$4.5M	Current Allocation:	\$2.0M		

### Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Planning</p> <p><b>18-Month Outlook</b></p> <ul style="list-style-type: none"> <li>Continue analysis of impacts of new water supply into Crystal Springs Reservoir</li> <li>Identify and evaluate Direct Potable Reuse opportunities</li> </ul>	<ul style="list-style-type: none"> <li>Operational and water quality challenges in Crystal Springs Reservoir</li> <li>Construction challenges in parts of distribution area</li> <li>Water supply during non-drought years would impact operations and storage availability in the Regional Water System</li> </ul>	<ul style="list-style-type: none"> <li>Reduces Bay discharges</li> <li>Provides a new drought-resistant water supply</li> </ul>

## 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), 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:	\$980M	Est. Annual O&M:	TBD
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### Institutional Complexity

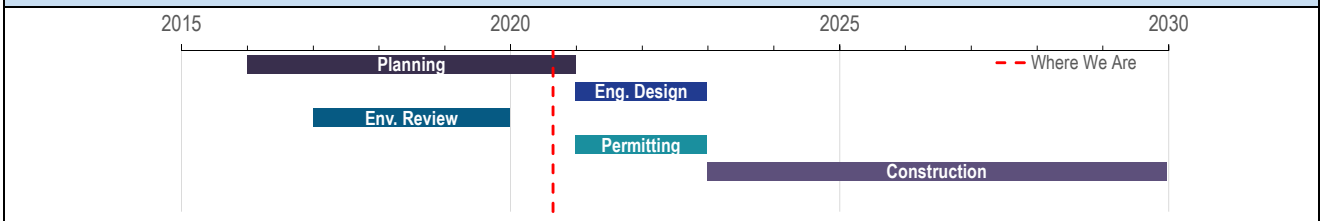
SFPUC Only  Multi-Party Partnership

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

### SFPUC Budget Information

10-Yr CIP Budget Allocation:	\$10.5M	Current Allocation:	\$2.5M
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### Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
Planning; Environmental Review <b>18-Month Outlook</b> <ul style="list-style-type: none"> <li>Determine feasible conveyance options and constraints</li> <li>Continue participation in Multi-Party Agreement for planning</li> <li>Determine water supply options and constraints</li> <li>Evaluate participation in JPA</li> </ul>	<ul style="list-style-type: none"> <li>Capacity and institutional constraints for conveyance to RWS</li> <li>Firm water supply source</li> <li>Depending on conveyance option, water quality and need for pretreatment</li> </ul>	<ul style="list-style-type: none"> <li>Provides operational flexibility, particularly in drier years</li> <li>Allows the SFPUC to manage existing supply more efficiently</li> </ul>



## 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

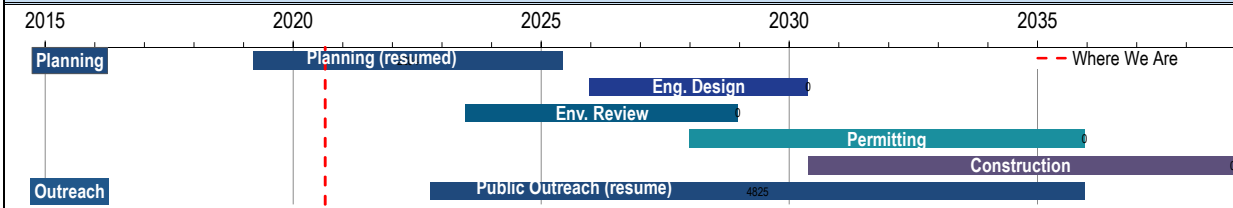
### SFPUC Project Manager

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

### Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
<p>Planning</p> <p><b>18-Month Outlook</b></p> <ul style="list-style-type: none"> <li>Develop feasible project scenarios, considering water rights and constraints for transfers and exchanges</li> <li>Consider public-private partnership options</li> </ul>	<ul style="list-style-type: none"> <li>Some impacts to sensitive fish may be unavoidable</li> <li>Water rights and permitting likely to be challenging</li> <li>Conveyance options are limited to transfer water to Regional Water System</li> </ul>	<ul style="list-style-type: none"> <li>Availability during dry years</li> <li>Lower GHG emissions than seawater desalination</li> <li>Leverages existing infrastructure</li> <li>Storage option in Los Vaqueros provide dry year benefits</li> </ul>

## 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

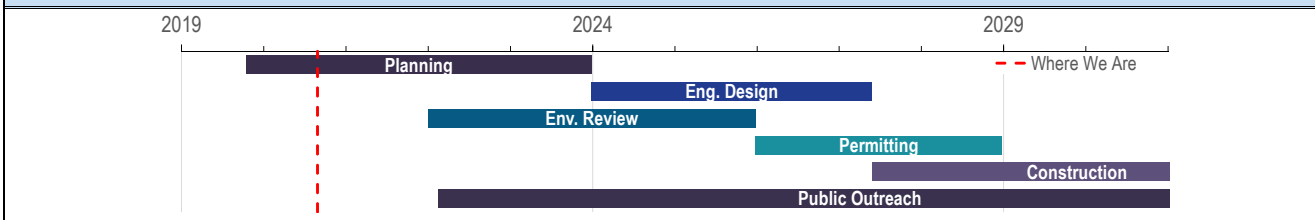
Average Annual Supply	Availability	Supply Type	Local or Regional?	Capital Cost/Acre-Foot
Dependent on water supply	All Years	Transfer	Regional	TBD

Total Project Cost				Institutional Complexity	
Est. Capital Cost:	TBD	Est. Annual O&M:	TBD	SFPUC Only <span style="background-color: orange; display: inline-block; width: 100px; height: 15px;"></span>	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:	\$3.0M	Current Allocation:	\$2.0M
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### Estimated Project Schedule (Not a Baseline Schedule)

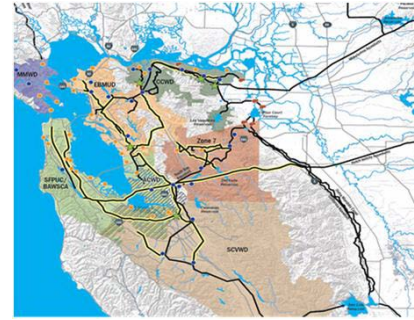


Current Status	Risks and Uncertainties	Benefits
Conceptual	<ul style="list-style-type: none"> <li>Institutional arrangements / willingness of stakeholders</li> <li>Availability of supply</li> <li>Availability of SBA capacity</li> </ul>	<ul style="list-style-type: none"> <li>Leverages existing infrastructure</li> </ul>
<b>18-Month Outlook</b> <ul style="list-style-type: none"> <li>Memo summarizing alternatives</li> <li>Evaluate likelihood that South Bay Aqueduct will provide conveyance (through coordination with State and SBA Contractors, and through BARR simulation project)</li> <li>Identify conceptual alternatives and costs for a new intertie with EBMUD</li> </ul>		

## 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 San Antonio Reservoir.

### Project Partners

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

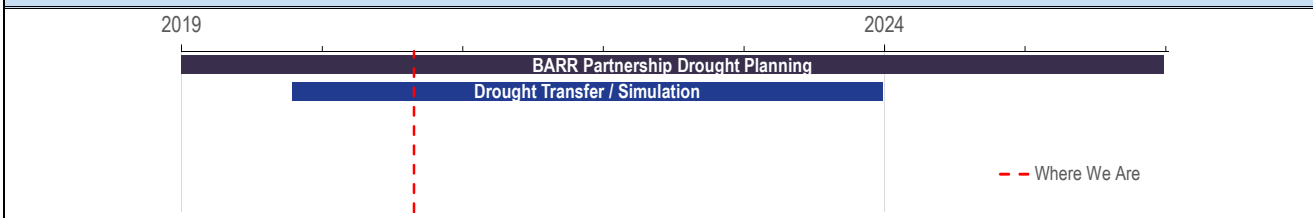
### SFPUC Project Manager

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			Institutional Complexity	
Est. Capital Cost:	TBD	Est. Annual O&M:	TBD	SFPUC Only <span style="background-color: orange; color: white; padding: 2px;">[REDACTED]</span> 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"> <li>Institutional arrangements / willingness of stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Encourages regional water supply planning and collaboration</li> <li>Leverages existing infrastructure</li> </ul>
<b>18-Month Outlook</b> <ul style="list-style-type: none"> <li>Conduct water transfer simulation through SBA, considering operational, water quality, financial and legal impacts</li> <li>Conduct water quality analysis</li> <li>Prepare draft executable agreement</li> <li>Incorporate stakeholder input in strategy report development</li> </ul>		

## 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

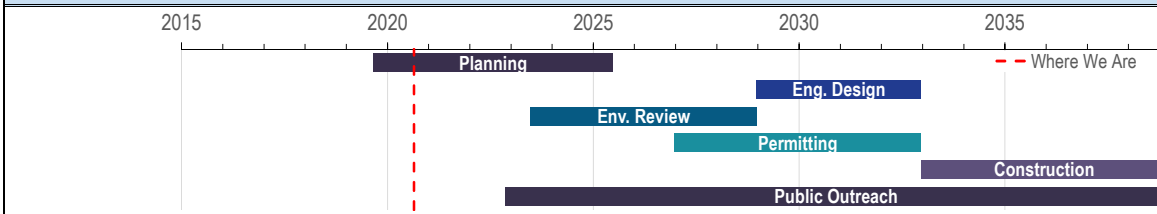
Susan Hou

### 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				Institutional Complexity	
Est. Capital Cost:	TBD	Est. Annual O&M:	TBD		SFPUC Only <span style="margin-left: 100px;">Multi-Party Partnership</span>
<b>SFPUC Budget Information</b>				<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>	
10-Yr CIP Budget Allocation:	\$3.5M	Current Allocation:	\$2.5M		

### Estimated Project Schedule (Not a Baseline Schedule)



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

## 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

<b>Est. Capital Cost:</b>	TBD	<b>Est. Annual O&amp;M:</b>	TBD
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### Institutional Complexity

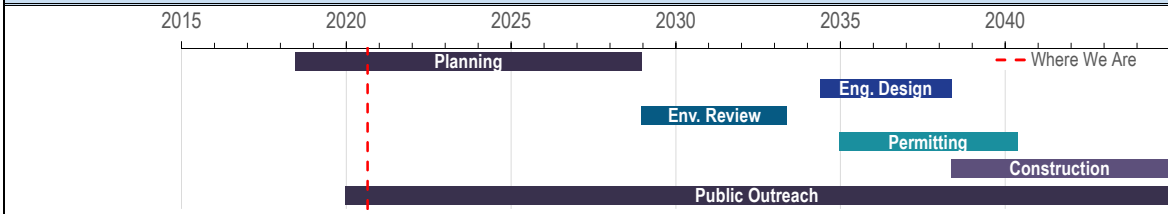


### SFPUC Budget Information

<b>10-Yr CIP Budget Allocation:</b>	\$5.5M	<b>Current Allocation:</b>	\$0.5M
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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

- 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
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### Institutional Complexity

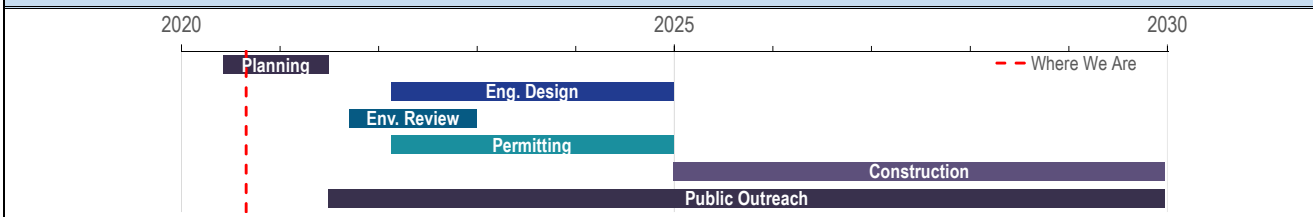
SFPUC Only	Multi-Party Partnership
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### SFPUC Budget Information

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

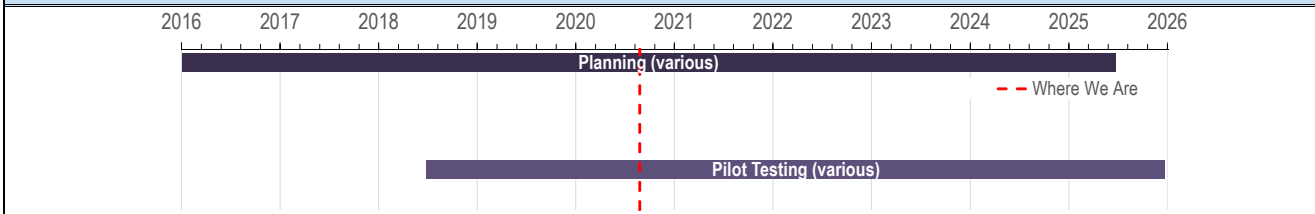
Total Project Cost	Institutional Complexity
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Est. Capital Cost:	TBD	Est. Annual O&M:	N/A	SFPUC Only		Multi-Party Partnership
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### SFPUC Budget Information

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.
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### Estimated Project Schedule (Not a Baseline Schedule)



Current Status	Risks and Uncertainties	Benefits
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Planning; Pilot Testing <b>18-Month Outlook</b> <ul style="list-style-type: none"> <li>Test alternative leak detection technologies</li> <li>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</li> <li>Provide grant support for the implementation of brewery process water</li> </ul>	<ul style="list-style-type: none"> <li>Individual projects may be small, making them costly</li> </ul>	<ul style="list-style-type: none"> <li>Identifies new technology opportunities to increase efficiency and water availability</li> </ul>
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## 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

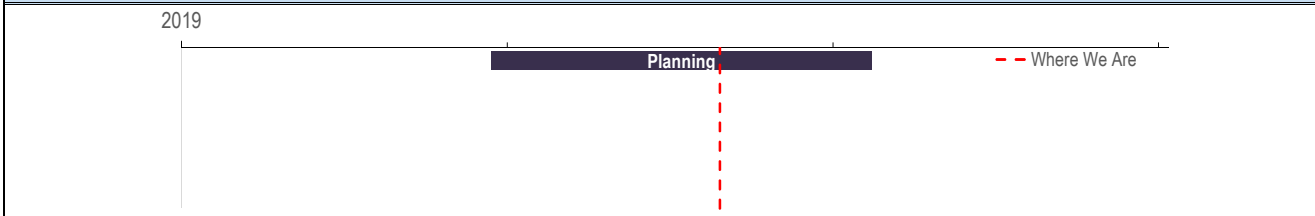
### SFPUC Project Manager

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	
<b>Est. Capital Cost:</b>	Not yet known	<b>Est. Annual O&amp;M:</b>	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>	
<b>CIP Budget Allocation:</b>	\$0.03M			

### Estimated Project Schedule (Not a Baseline Schedule)



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



## **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
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.

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
<b>SUBTOTAL Water Supply Needs, WSIP Carryover</b>		<b>2</b>
Instream Flow Obligations - San Mateo Creek	Drought (near-term)	3 <sup>1</sup>
Instream Flow Obligations - Tuolumne River <sup>2</sup>	Drought (near-term)	93
<b>SUBTOTAL Instream Flow Obligations</b>		<b>96</b>
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
<b>SUBOTAL Customer Demands</b>		<b>&gt;15.5</b>
<b>Total Drought (Near-Term) Needs</b>		<b>98</b>
<b>Total All Year Needs</b>		<b>&gt;15.5</b>
<b>TOTAL NEEDS</b>		<b>113.5</b>

<sup>1</sup> Flow release averaged over wet and dry years is 3.5 mgd; however, the average over drought years is 3 mgd

<sup>2</sup> Estimated environmental flow obligation associated with the Bay Delta Water Quality Control Plan

### ***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

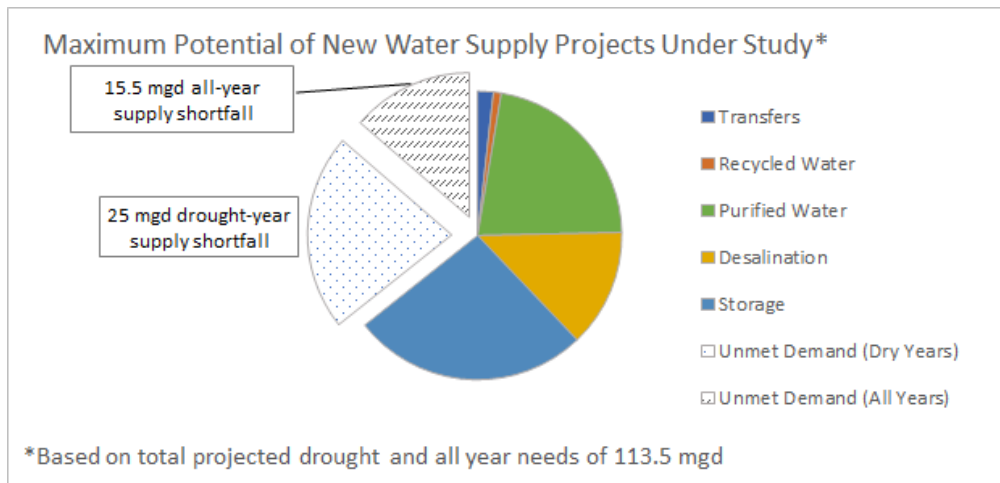
implementing both local and regional groundwater projects to produce local drinking water supplies.

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 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.

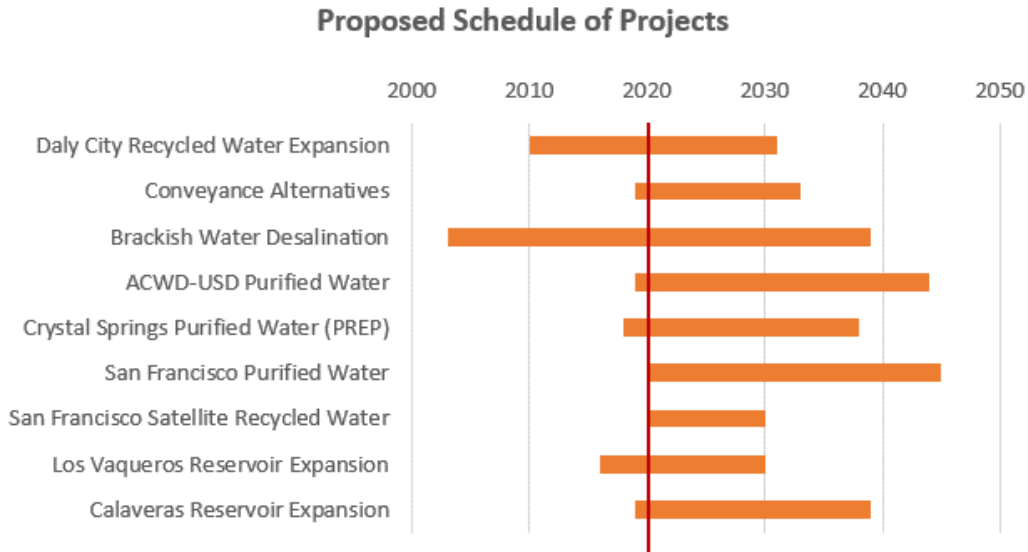
### ***Planning for Implementation***

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 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 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 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

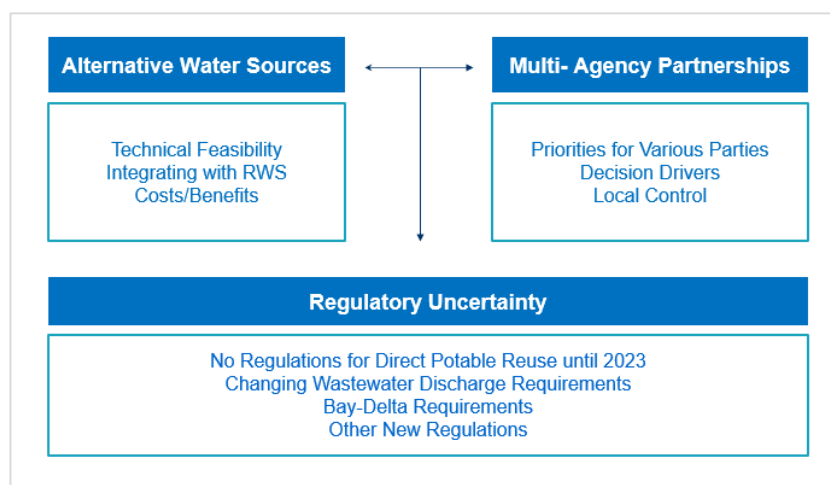
encumbering funds and invoicing and because the majority of projects are multi-party partnerships which further exacerbates that lag, we will not be able to report on expenditures in real-time.

### **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.

### **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.