NON-AGENDA

September 6, 2019

Board Policy EL-7 Communication and Support to the Board
The BAOs shall inform and support the Board in its work.

Board correspondence has been removed from the on line posting of the Non-Agenda to protect personal contact information. Lengthy reports/attachments may also be removed due to file size limitations. Copies of board correspondence and/or reports/attachments are available by submitting a public records request to publicrecords@valleywater.org.

CEO BULLETIN

To: Board of Directors
From: Norma J. Camacho, CEO

Chief Executive Officer Bulletin
Week of August 30 – September 5, 2019

Board Executive Limitation Policy EL-7:
The Board Appointed Officers shall inform and support the Board in its work. Further, a BAO shall 1) inform the Board of relevant trends, anticipated adverse media coverage, or material external and internal changes, particularly changes in the assumptions upon which any Board policy has previously been established and 2) report in a timely manner an actual or anticipated noncompliance with any policy of the Board.

1. Annual Combined Monitoring Report Submitted to State Water Resources Control Board Division of Drinking Water

In 1988, per Water Supply Permit No. 02-88-005, the State Water Resources Control Board Division of Drinking Water (DDW), formerly known as the State Department of Health Services (Drinking Water Program), permitted Valley Water to use Anderson, Calero, Coyote, and Almaden reservoirs for domestic water supply.

To maintain compliance with respect to the permit's provisions and to ensure the safety of these important water supply resources, Valley Water has been performing comprehensive water quality monitoring of Anderson, Coyote, Calero, and Almaden reservoirs and their tributaries. The water quality information obtained along with a status report of the watershed management activities are provided to DDW annually in August.

This year's annual water quality monitoring report was successfully submitted to DDW on August 29, 2019.

For further information, please contact Bhavani Yerrapotu at (408) 630-2735.

2. Safe, Clean Water Grants Application Period Open From August 30-November 1

Valley Water is now accepting applications for the 2020 grants from August 30 through November 1, 2019. This grant funding is part of the Safe, Clean Water and Natural Flood Protection Program, which was approved by voters in 2012 to allow Valley Water to reinvest into the community for meaningful projects.

This year, Valley Water has up to $2.1 million available in voter-approved Safe, Clean Water grant funding for projects and activities that meet the minimum qualifications and eligibility criteria for:

- Water Conservation Research Grants – up to $100,000 total available
- Pollution Prevention Partnerships and Grants – up to $500,000 total available
- Wildlife Restoration Grants – up to $1.3 million total available
- Mini-Grants – up to $200,000 total available (up to $5,000 per project)

New this year, Valley Water is launching an online grants management system, valleywater.fluxx.io. This online system will allow prospective grantees to track the progress of each application and streamline the grant invoicing, reporting, and other administration functions. Additionally, Valley Water will offer bonus points to organizations that demonstrate financial stability, projects that serve underrepresented communities, and organizations that are first-time applicants.

For more information about the grant award process, eligibility criteria, minimum qualifications, and how to apply, visit valleywater.org/grants, contact grants@valleywater.org, or attend an informational grants workshop:

- Tuesday, September 10, 2019, 10:30–11:30 a.m.
  Valley Water Headquarters Building, Room A-143
  5700 Almaden Expressway, San Jose, CA 95118

- Wednesday, September 18, 2019, 6:00–7:00 p.m.
  Valley Water Administration Building, Room B-108
  5750 Almaden Expressway, San Jose, CA 95118

Valley Water is promoting the FY20 grants cycle opportunity through a press release, blog post, social media posts, Nextdoor posts, brochures, stakeholder e-mails, and more. The grant applications will be evaluated by a review committee and staff will make recommendations to the Board for final determination on projects awarded funding.

For further information, please contact Rick Callender at (408) 630-2017.

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3. Valley Water Hosts an Algal Identification Workshop

Valley Water is one of the Bay Area's leading agencies, not only in monitoring and identification of Cyanobacteria, but also in early detection and response preparedness, in the event that algal toxins find their way into our source supply.

On August 29-30, 2019, Valley Water's laboratory, in partnership with the California Department of Public Health (CDPH), sponsored a two-day cyanobacteria identification and taxonomy workshop at CDPH's Microbial Disease Laboratory in Richmond. The workshop was tailored to provide hands-

on experience in proper identification of algae in environmental samples, especially distinguishing harmful algae blooms (HABs).

The workshop, presented by Phycologist Andrew Chapman of Greenwater Laboratories of Florida, benefited representatives from Valley Water, California Department of Public Health, East Bay Regional Park District, Zone 7 Water Agency, San Francisco Public Utilities Commission, East Bay Municipal Utility District, Alameda County Water District, California Department of Water Resources, Contra Costa Water District, City of Santa Cruz, South San Joaquin Irrigation District, Solano County, and Kern County Public Health Department.

This workshop is expected to enhance sister agencies' algal identification expertise and serve as technical resource for each other, sharing the common goals of keeping the public safe from HABs. Valley Water is diligently working with local agencies, regulators, and treated water retailers to educate them about HAB issues, Valley Water's cyanotoxin monitoring and response plan, and communication strategies in the event of potential detection of cyanotoxin in the treated water.

For further information, please contact Bhavani Yerrapotu at (408) 630-2735.

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4. Water Conservation Program Receives High Marks in Recent Customer Satisfaction Survey

Each year the water conservation program at Valley Water conducts annual customer surveys to better understand the public's level of satisfaction and to identify areas of improvement. The FY 18/19 survey results demonstrate that the programs continue to meet and exceed the public's expectations, similar to surveys in previous years. Approximately 2,257 surveys were sent to FY 18/19 program participants and the response rate was 23 percent (525). The majority of respondents were satisfied or found excellent value in the programs, as demonstrated by the combined approval rating of 91 percent. Most respondents also found the quality of service, clarity of the application process, timeliness of rebates, and quality of online materials either satisfactory or excellent. Programs also received several positive testimonials including:

"Really appreciate Santa Clara Valley Water District offering this program. It absolutely made me switch over to a smart irrigation system. The water savings have been HUGE! There was a period of about 2.5 months where I believe the sprinkler system did not turn on at all! I'm now addicted to water savings."

Feedback that was received varied by program, and changes were made to programs to address customer concerns. These customer satisfaction surveys show that water conservation programs continue to be favorable to the public, while also helping meet Valley Water's long-term conservation goal of saving 110,000 acre-feet per year by 2040.

For further information, please contact Jerry De La Piedra (408) 630-2257.

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5. Winfield Warehouse Roof Fall Protection Update

There are more than a dozen trades in which workers are permitted regular access to flat or low-sloped roofs, including but not limited to roofing, building maintenance, HVAC, electrical, plumbing and telecommunications personnel. Nearly all commercial unit skylights installed on roofs accessed regularly by workers are aluminum framed and most use some form of plastic glazing (acrylic is most common).

Periodically, fatalities attributed to falls through skylights are highlighted in industry publications. The actual number of fatalities associated with skylights and skylight openings is very small when compared to other workplace injuries and fatalities; however, it is important for all workers that access roofs to be aware of all potential hazards, including the potential to fall through a skylight, and how to prevent such incidents.

During a roof fall hazards assessment performed at the Almaden Campus and Winfield Complex, 81 unprotected fiberglass skylights were discovered on the Winfield Warehouse. Fiberglass skylights can degrade over time and pose increased fall hazards for staff performing maintenance activities on the roof. Recommendations were made to guard these skylights and on August 13th Valley Water installed guards on 33 skylights located on the Winfield Warehouse roof. Currently, skylight guards are being fabricated for the remaining 48 unguarded skylights. In the interim, staff that are required to access roofs with unguarded skylights are fully trained in the potential skylight fall risk and roof access is either delayed, or substitute fall protection methods are being deployed, until the remaining skylights can be guarded.

For further information, please contact Tina Yoke at (408) 630-2385.

Report Name: Board Member Requests

Request	Request Date	Director	BAO/Chief	Staff	Description	20 Days Due Date	Expected Completion Date	Disposition
I-19-0015	09/05/19	Santos	Camacho	Togami	Director Santos has expressed concern with the County building a shed in the in the Alviso Marina County Park parking lot. Staff is gathering information.	09/25/19		
I-19-0016	09/05/19	Santos	Hawk	Baker	Director Santos request,Staff to investigate a water leak from an unknown source at the City of San Jose's Penitencia Creek Park to determine if it's a District raw water pipeline. .	09/25/19		
R-19-0012	08/27/19	Lezotte	Yoke	Gordon	Staff is to coordinate a mock active shooter exercise replicating an active shooter at a Board Meeting scenario, and investigate, bringing on-site CERT Training (Community Emergency Response Team)	09/25/19		

Valley Water

MEMORANDUM

FC 14 (02-08-19)

TO: Board of Directors

FROM: Nina Hawk

SUBJECT: 2017 Consultant Report on Proposed Lake Del Valle Modifications

DATE: August 27, 2019

This memorandum provides staff follow-up to the Committee Agenda Memorandum for Valley Water's Water Storage Exploratory Committee (Committee) on August 27, 2019, entitled "Update on Proposed Lake Del Valle Modifications" (Item 4.5, 19-0775), per request of the Committee.

Lake Del Valle is a storage reservoir in Alameda County southeast of Livermore, owned by the State of California and operated by the California Department of Water Resources (DWR) as part of the State Water Project (SWP). DWR operates Lake Del Valle to meet peaking demands and improve water quality for the Santa Clara Valley Water District (Valley Water), Alameda County Water District (ACWD), and Alameda County Flood Control and Water Conservation District (Zone 7). ACWD and Zone 7 also have rights to local water supplies captured by Lake Del Valle. Additionally, the East Bay Regional Park District (EBRPD) manages public access to Lake Del Valle for recreational purposes.

Valley Water, ACWD, and Zone 7 (the SBA agencies), with input from EBRPD, investigated opportunities in 2017 to refine reservoir operations in a manner that could increase water storage in Lake Del Valle, while complying with flood management requirements and minimizing impacts to existing recreational facilities. Details of this investigation were compiled into a report from David Ford Consulting Engineers (Report), which is included as Attachment 1.

The report identified options which had the potential to increase operational storage capacity up to 22,000 acre-feet per year and meet flood management objectives, including operational changes via forecasting models and/or flood management pool alterations, and structural changes to increase reservoir capacity. However, these options also appeared to result in more frequent inundation of Lake Del Valle recreational facilities. The report indicated that implementation of any re-allocation methods or physical alterations would likely require intensive coordination with the U.S. Army Corps of Engineers and changes to water control guidelines, including review by various other state and federal agencies.

for Nina Hawk
Chief Operating Officer
Water Utility Enterprise

Attachment 1: David Ford Consulting Engineers Lake Del Valle Report

Lake Del Valle forecast-informed reservoir operations (FIRO) initial viability study

Revised January 31, 2018

Alameda County Water District
43885 South Grimmer Blvd
Fremont, CA 94538

DAVID FORD CONSULTING ENGINEERS

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Contents

Executive summary

Motivation for this study

Alameda County Water District (ACWD), Santa Clara Valley Water District (SCVWD), and Zone 7 of the Alameda County Flood Control and Water Conservation District (Zone 7 Water Agency or Zone 7), collectively referred to as the South Bay Contractors (SBCs, or "agencies") of the State Water Project (SWP), rely on water deliveries from the Sacramento-San Joaquin Delta (Delta) via the South Bay Aqueduct (SBA) to serve over 2.5 million residents in the San Francisco Bay Area. Lake Del Valle Reservoir (Lake Del Valle) is an off-stream storage facility for the SBA that provides regulatory storage, local water supply storage for two of the SBCs who have pre-established water rights, flood control for Arroyo del Valle and Alameda Creek, and recreation. As part of the SWP infrastructure, Lake Del Valle is owned and operated by the California Department of Water Resources (DWR). However, due to partial federal funding under the Flood Control Act of 1962, Lake Del Valle is regulated by the United States Army Corps of Engineers (USACE) as a non-federal dam and must operate within the flood management guidelines outlined in its Water Control Manual (WCM). Recreation facilities at Lake Del Valle are managed by the East Bay Regional Parks District (EBRPD).

Increased storage in Lake Del Valle would improve water supply availability and reduce the extent of water shortage emergencies caused by delivery disruptions from the Delta and extreme dry conditions. In addition, increased storage could be a valuable benefit to DWR operations as well as to the 2.5 million Bay Area residents that depend on the Delta in the event of a catastrophe such as an earthquake or flooding. In March 2016, the SBCs submitted a concept paper to the California Water Commission's Water Storage Investment Program. The concept paper outlined a study to increase emergency water supply through reoperation of the reservoir while complying with Lake Del Valle's flood management requirements and maintaining or enhancing the functions of the existing recreational facilities. The concept paper advocated modernizing the flood management rules prescribed in the 1978 water control manual (WCM) through use of a forecast-informed reservoir operation (FIRO) approach, which relies on modern weather and water forecasting to optimize reservoir storage and releases.

Scope of FIRO Initial Viability Study

The SBCs and EBRPD (collectively, Stakeholder Agencies) identified three potential methods for increasing water supply availability as follows:

- **Forecast-informed reservoir operations (FIRO).** FIRO is an operational scheme in which forecasted inflow information is used to reallocate variable flood management capacity to the water conservation pool temporarily and to make operation decisions.
- **Permanent reallocation of flood management capacity to the water conservation pool.** Reallocation is a set volume by which the water conservation pool is increased and the flood control pool is decreased. (The total capacity of the reservoir is unchanged.)
- **Structural changes (for example, a dam raise) to increase total capacity.** Structural changes such as dam and spillway raises add

capacity to the reservoir. At Lake Del Valle, such changes would be anticipated to increase the water conservation pool, while maintaining the total flood management capacity.

The Stakeholder Agencies wish to know how FIRO alone or in combination with one of the other potential methods might affect:

- Water supply availability at Lake Del Valle in terms of runoff capture and storage.
- Flood management operations at Lake Del Valle.
- Inundation frequency of recreational facilities at Lake Del Valle.

Analytical approach

The analytical approach for this FIRO initial viability study used historical streamflow data over a 45-year period (1969 through 2015) to simulate a variety of operational outcomes at Lake Del Valle that would require either a planned major deviation from or a revision to WCM rules (USACE Sacramento District 1978). FIRO is based on the idea that modern forecasting and modeling tools can optimize the balance between flood control and water supply more effectively than the existing WCMs by providing adaptive, real-time forecasting. This study modeled a variety of scenarios where portions of the flood control pool in Lake Del Valle were reallocated to the water conservation pool, with reservoir releases in the model triggered by real historical flows "projected" from simulated 5-day forecasts.

A breakdown of the analytical approach for this FIRO initial viability study included the following steps:

1. Development of metrics for assessing the impacts to water supply, flood management, and recreational facilities from the implementation of FIRO alone and with other defined reallocation and structural configurations.
2. Refinement of the Lake Del Valle HEC-ResSim reservoir operations model developed and provided by Zone 7.
3. Definition of baseline (no-change) operations and the operational alternatives (i.e., FIRO alone, reallocation with FIRO, and structural changes with FIRO).
4. Development of a period of hydrologic record to be used as input into the HEC-ResSim model.
5. Configuration of the Lake Del Valle HEC-ResSim model for baseline operations, and simulation of baseline operations.
6. Configuration of the Lake Del Valle HEC-ResSim model for FIRO alone, reallocation with FIRO, and structural change with FIRO, and simulation of those operational alternatives.
7. Analysis, comparison, and interpretation of results from those simulations.

Findings

This study shows that FIRO coupled with either reallocation of the flood control pool or structural changes can increase water supply availability through increases in storage while meeting Lake Del Valle's flood management requirements (per the USACE WCM), given the modeled hydrologic conditions. However, all such scenarios require relocation of the

EBRPD's recreational facilities. Furthermore, all examined alternatives have only very limited potential to enhance runoff capture in Lake Del Valle. Downstream impacts on the alternative scenarios are summarized below:

- FIRO alone. FIRO alone provides a minimal increase in mean monthly average storage of 103 ac-ft per year, and essentially matches the baseline scenario in terms of flood management and recreational impacts. No significant increase in average annual runoff capture was demonstrated.
- Permanent reallocation of flood management capacity to the water conservation pool with FIRO. The reallocation-with-FIRO alternatives provide increases in mean monthly average storage that range from 4,933 ac-ft per year up to 22,062 ac-ft per year. Flood management requirements (per the USACE WCM) are met under all reallocation-with-FIRO scenarios for the modeled period (November 1969 to September 2015). However, storage reallocation with FIRO increases the frequency and magnitude of high release rates (those greater than 2,000 cfs) from the reservoir, with releases greater than 2,000 cfs made off storm peak so as not to exceed downstream thresholds defined by the WCM. More studies are needed to determine the extent of flood management impacts such as increased erosion downstream. Recreational facilities require relocation under all reallocation-with-FIRO alternatives. The reallocation-with-FIRO alternatives showed very minimal average annual runoff capture increases ranging from 36 ac-ft up to 152 ac-ft.
- Structural changes (for example, a dam raise) to increase total capacity with FIRO. Structural changes with FIRO (which added 5,000 ac-ft to the water conservation pool) provide an increase in mean monthly average storage of 4,942 ac-ft per year and a minimal increase in average annual runoff capture of 36 ac-ft. The flood management impact is similar to the baseline scenario. Recreational facilities require relocation.

A brief summary of the findings is provided in Table 1. Table 22 provides a more complete summary of the potential impacts to water supply, flood management, and recreational facilities by alternative, and detailed results can be found in Appendix III through Appendix IX.

Table 1. Brief summary of findings

Reoperation alternative (1)	Water supply availability (2)	Potential impacts (as compared to baseline) on: Flood management (3)	Recreational facilities (4)
FIRO alone	• Slight increase in storage • No increase in runoff capture	Similar to baseline	Similar to baseline
5,000 ac-ft reallocation with FIRO	• Increase in storage proportional to reallocation volume • Slight increase in runoff capture	• Increased pool elevations and downstream flows for largest events and least likely flows • Most-likely flows have a similar probability of exceedence as baseline	• Increased number of days and probability that recreational facilities are inundated • Kayak rental and sewage lift station facilities will need relocation
10,500 ac-ft reallocation with FIRO			
15,000 ac-ft reallocation with FIRO			
25,500 ac-ft reallocation with FIRO			
Structural changes to add 5,000 ac-ft with FIRO	• Increase in storage proportional to reallocation volume • Slight increase in runoff capture	Similar to baseline	

Limitations of this study

Because of the methods, data, and assumptions employed in this initial viability study, the analyses and results are limited in their applicability. In the calculations of storage and runoff capture, the model did not distinguish between Table A water (deliveries from the State Water Project Stored in Lake Del Valle) and local inflows when assigning volumes to storage. Rather, reservoir fill took all types of water and storage was calculated simply as the volume of water in the reservoir. Runoff capture was calculated as the volume of additional reservoir inflows stored in the water conservation pool above the historical baseline. Water rights and agency-specific storage use in Lake Del Valle also did not factor into the study.

In terms of data considerations, the historical streamflow data used in the study was considered "perfect" and no statistical errors were introduced to the model. As a result, all modeling output is precise and based on the perfect input assumption. However, in the analysis of the study's findings, only model output of significant magnitude is discussed. In addition, the streamflow data used to generate the hydrologic dataset spans only 45 years of historical record, and as a result, is not intended to cover the full range of storm

severity that could be experienced in the basin. Specifically, the peak historic events of 1995 and 1998 have return periods of approximately 15 and 20 years respectively (more common than the 100-year storm); more severe storm events would need to be evaluated in future studies. [These return period estimates are based on the USGS peak streamflow data for Alameda Creek near Niles (USGS 2017) and the regulated peak flow-frequency curve on Plate 3 of the Lake Del Valle WCM.] The hydrologic dataset used for the HEC-ResSim model also remained a constant input value and was not iteratively adjusted to account for changes in reservoir operations under different model scenarios.

In terms of FIRO assumptions, the 5-day forecast used in the model was simulated by using real historical values from the historical inflow data series, allowing the simulated forecast to perfectly predict future inflow. This "perfect" forecast is an optimistic representation of FIRO, but was chosen for clarity. Despite these limitations, the study provides a sound basis for deciding whether to pursue further investigations into the feasibility and effectiveness of FIRO, alone or with reallocation, to increase water supply availability in Lake Del Valle.

Future steps to implement reservoir reoperations

Future steps to implementing FIRO, alone or in combination with another alternative, are as follows:

- Implementing FIRO alone could be accomplished through approval of a planned major deviation by the US Army Corps of Engineers (USACE) San Francisco District (USACE South Pacific Division 2013). The USACE guidance explaining the deviation process is provided as Appendix X. DWR would operate Lake Del Valle according to the deviation guidelines provided by the USACE.
- Implementing any reallocation alternative would require a formal revision to the WCM. Changing the WCM would be a considerable, multi-year effort. More studies are also required to evaluate downstream impacts of the modified release patterns and rates from Lake Del Valle reoperation under more severe storm conditions.
- Implementing structural changes would require a planning study, a dam design, and a WCM revision (also a multi-year effort).

Motivation for this study

Alameda County Water District (ACWD), Santa Clara Valley Water District (SCVWD), and Alameda County Flood Control and Water Conservation District (Zone 7), collectively referred to as the South Bay Contractors (SBCs, or "agencies") of the State Water Project (SWP), rely on water deliveries from the Sacramento-San Joaquin Delta (Delta) via the South Bay Aqueduct (SBA) to serve over 2.5 million residents in the San Francisco Bay Area. Lake Del Valle Reservoir (Lake Del Valle) is an off-stream storage facility for the SBA that provides regulatory storage, local water supply storage for two of the SBCs who have pre-established water rights, flood control for Arroyo del Valle and Alameda Creek, and recreation. As part of the SWP infrastructure, Lake Del Valle is owned and operated by the California Department of Water Resources (DWR). However, due to partial federal funding under the Flood Control Act of 1962, Lake Del Valle is regulated by the United States Army Corps of Engineers (USACE) as a non-federal dam and must operate within the flood management guidelines outlined in its water control manual (WCM). Recreation facilities at Lake Del Valle are managed by the East Bay Regional Parks District (EBRPD).

The SBCs are situated south of the Delta but upstream of any major water storage facilities within the southern portions of the SWP, and are therefore uniquely vulnerable to delivery disruptions from the Delta. Lake Del Valle plays an important role in the augmentation of water deliveries to the SBCs when disruptions occur. However, because of limited storage and operational rigidity under the WCM, only short duration disruptions in water deliveries from the Delta can be accommodated. On January 31, 2014, DWR announced a 0% Table A allocation (i.e. no water deliveries from the State Water Project) for the first time in its 54-year history. Although the allocation was subsequently raised to 5%, Table A water was available only after September 1, after the high summer demand season. Furthermore, the extreme dry conditions resulted in highly impaired water quality in the Delta, requiring that supplies in Lake Del Valle be used for water quality blending to meet regulatory water quality standards. All three agencies declared water shortage emergencies as a result of the disrupted Delta deliveries.

Increased storage in Lake Del Valle would improve water supply availability and reduce the extent of water shortage emergencies caused by extreme dry conditions. In addition, increased storage could be a valuable benefit to DWR operations as well as to the 2.5 million Bay Area residents that depend on the Delta in the event of a catastrophe such as an earthquake or flooding. Building upon the 2001 and 2009 Delta Water Supply Reliability Studies that assessed the costs and benefits of increasing storage capacity in Lake Del Valle, the SBCs submitted a concept paper to the California Water Commission's Water Storage Investment Program in March of 2016. The concept paper outlined a study to increase emergency water supply through reoperation of the reservoir while complying with Lake Del Valle's flood management requirements and maintaining or enhancing the functions of the existing recreational facilities. Reoperation of Lake Del Valle would require either approval of a planned major deviation under the existing WCM or a revision to the WCM rules. Specifically, the concept paper advocated modernizing the flood management rules prescribed in the 1978 WCM through use of a forecast-informed reservoir operation (FIRO) approach,

which relies on modern weather and water forecasting to optimize reservoir storage and releases.

The rationale for using FIRO to determine the viability of increasing water supply availability at Lake Del Valle was multifold. The FIRO management strategy was developed initially and tested for proof-of-concept on Lake Mendocino by a coalition of government agencies (including USACE). The August 2017 Preliminary Viability Assessment (PVA) for the Lake Mendocino project determined that FIRO was viable as a management strategy for the study case and could further benefit water supply and environmental flows without diminishing flood control or dam safety—in other words, FIRO supported adjustments to Lake Mendocino's WCM. In addition, the methodology behind the FIRO approach was designed to transfer to other watersheds and reservoir operations. Incorporation of FIRO would also prime the SBCs to benefit directly from the $19 million Proposition 84 Integrated Regional Water Management grant awarded to the San Francisco Bay Region for Atmospheric Quantitative Precipitation Information (AQPI) systems. AQPI explores large-scale, long-range precipitation predictions that help inform reservoir operation and flood risk estimation, and is expected to assist with the improved forecasting necessary for the FIRO program at Lake Mendocino and for any future FIRO adopters in the region.

The SBCs and EBRPD (collectively, the Stakeholder Agencies) are undertaking the studies shown in Table 2 to test the feasibility of proposals listed in the concept paper.

Table 2. Feasibility studies related to this FIRO initial viability study

No. (1)	Element (2)	Description (3)	Conducted by (4)
1	Lake Del Valle forecast informed reservoir operations (FIRO) initial viability study *(This study)*	Critical first test. Evaluate whether flood protection, public safety, and recreation currently provided by the dam/reservoir can be maintained if water supply availability were to be increased through FIRO-based alternatives, including FIRO with storage reallocation and FIRO with the construction of additional storage.	David Ford Consulting Engineers
2	Valuation studies	Assess value of all recreational facilities. Used for cost assumptions if reoperation were to result in need to relocate and expand recreation facilities.	VFA, Inc.
3	Conceptual engineer design to accommodate lowering lake levels	Preliminary engineering study to modify or relocate recreation facilities to become unavailable when lake levels are drawn down below current minimums (boating facilities and water treatment plant intake).	KSN Engineers

No. (1)	Element (2)	Description (3)	Conducted by (4)
4	Yield analysis	Integrated operational modeling to see if Arroyo Valle water supply yield can be increased under existing water rights permits held by Zone 7 and ACWD.	ACWD and Zone 7 Staff
5	Water quality blending analysis	SBA model for blending in dry years to assess benefit of extending limited Delta supply through blending.	ACWD, SCVWD, and Zone 7 Staff

Description of the watershed

Del Valle Dam and Reservoir, shown in Figure *1*, are located on the Arroyo Del Valle, part of the Alameda Creek watershed, just south of Livermore, CA. The watershed area above the reservoir is 146 sq mi and ranges in elevation from 701.70 ft (the typical winter reservoir pool elevation) to 4,089.00 ft (the peak of Eylar Mountain). The Arroyo Del Valle is a tributary to the Arroyo de la Laguna, itself a major tributary of Alameda Creek. Ultimately, the Alameda Creek watershed drains into southern San Francisco Bay.

There are two other reservoirs in the basin, Calaveras Reservoir and Lake Turner (San Antonio Dam). These reservoirs are located on Calaveras and San Antonio creeks, respectively. Both are operated by the San Francisco Public Utilities Commission. Both reservoirs are operated primarily for water supply and historically have little to no effect on flood flows downstream (USACE 1978).

Description of the dam and reservoir

Del Valle Dam and Reservoir were authorized by the federal Flood Control Act of 1962, and federally funded in part. As noted above, the dam is operated by DWR under USACE regulations for non-federal dams. In general, the reservoir is operated to supply water via the SBA and to manage flood flows downstream at the Niles US Geological Survey (USGS) gage.

Del Valle Dam is an earthen embankment structure with a crest elevation of 773.00 ft and crest length of 880.00 ft. Lake Del Valle has 40,000 ac-ft of conservation storage capacity and 37,000 ac-ft of flood management capacity. The dam has five valves at varying elevations for water supply outlets, two 6-ft by 7-ft flood control gates at an invert of 609.05 ft, and an uncontrolled morning glory spillway with a crest elevation of 745.00 ft.

Three potential methods for increasing water supply availability

The Stakeholder Agencies identified three potential methods for increasing water supply availability as follows:

- **Forecast-informed reservoir operations (FIRO).** FIRO is an operational scheme in which forecasted inflow information is used to reallocate variable flood management capacity to water conservation capacity temporarily and to make operation decisions.

- **Permanent reallocation of flood management capacity to water conservation capacity.** Reallocation shifts a set volume from the reservoir's flood management capacity to its water conservation capacity, i.e., the top of conservation (TOC) pool elevation is moved upward. (The total capacity of the reservoir is unchanged.)
- **Structural changes (for example, a dam raise) to increase total capacity.** Structural changes such as dam and spillway raises add capacity to the reservoir. At Lake Del Valle, such changes would be anticipated to increase the water conservation capacity, while maintaining the same flood management capacity.

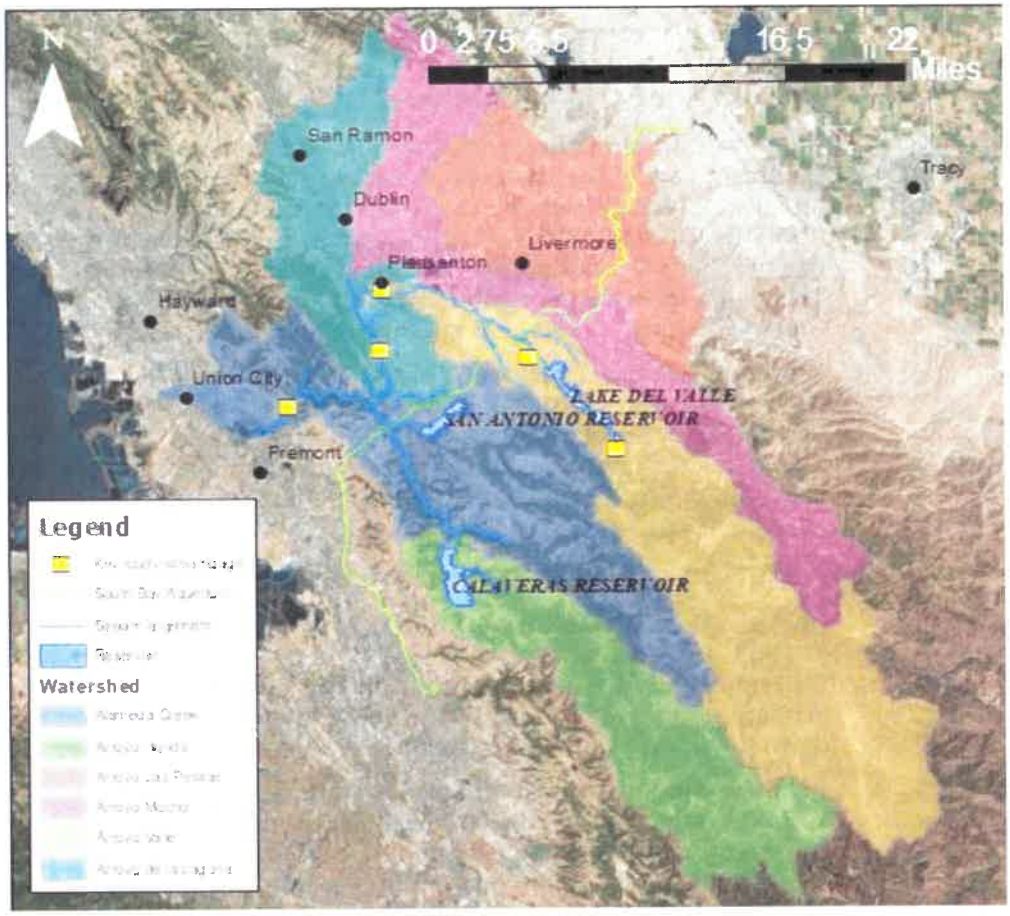

Figure 1. Lake Del Valle study area

FIRO definition and components

Lake Del Valle is operated in accordance with the rules documented in its water control manual (WCM) (USACE 1978). The WCM, developed at the time of the reservoir's construction using the best available information, uses fixed volumes allocated to the flood control pool and the water conservation pool. These volumes vary seasonally but are independent of inflow forecasts.

In contrast, forecast-informed reservoir operations (FIRO) is a management strategy that uses modeling, forecasting tools, and improved information to adjust the current reservoir operating procedures to better balance water

supply and flood management needs. FIRO allows operators to use space reserved for flood management to store water for water supply temporarily when forecasts show that corresponding space in the flood management pool will likely not be needed. Similarly, when the forecast indicates a need for the flood management pool to contain the future higher flows, FIRO establishes formal rules for releasing water in anticipation of the impending flood management need. Figure 2 shows an example comparison of traditional operations and hypothetical FIRO for illustrative purposes only.

FIRO entails some risk: anticipatory releases are made with the understanding that future inflows or local flows may fail to occur as forecasted. In that case, the space reallocated for water supply may remain unfilled, resulting in a loss of water supply due to the prior release. In addition, some risk exists that large releases made in anticipation of future flooding that does not occur may cause unnecessary channel damage downstream.

The components of a FIRO system include:

- Shared vision and understanding of operational goals.
- Policy to use variable flood management capacity to enhance water supply availability.
- Adaptive operational rules.
- A decision support system.
- Meteorological monitoring.
- Meteorological forecasting.
- Watershed monitoring.
- Watershed forecasting.

Figure 3 shows these components all contributing to FIRO at Lake Del Valle.

Implementation of FIRO requires changes to the reservoir operation rules. Thus, FIRO implementation requires that the USACE grant permission for a planned major deviation from the WCM. Implementation of any reallocation alternative or structural change alternative would require a revision to the WCM. The process for working with the USACE to bring about these changes is described in the "Synthesis of findings and next steps" section of this report.

Valley Water

MEMORANDUM

FC 14 (08-21-19)

TO:	Norma J. Camacho CEO	**FROM:**	Rick L. Callender Chief of External Affairs
SUBJECT:	Valley Water Public Safety Power Shutoff blog and FAQ	**DATE:**	September 3, 2019

Staff, working with subject matter experts, created a blog and FAQ sheet regarding PG&E's Public Safety Power Shutoff Program. The documents explain Valley Water's role providing wholesale treated water to retailers, raw surface water to a select group of customers, and manages local groundwater basins.

The FAQ sheet also has more specific details about our preparation, the potential impacts to our water supply, operations, and impact on customers if PG&E shuts off power in Santa Clara County as part of its Community Wildfire Safety Program.

Rick L. Callender
Chief of External Affairs

Attachment 1- Valley Water's preparation for extended power outages

Valley Water's preparation for extended power outages

Preparation for worst-case scenarios is a priority for Valley Water and its Board of Directors. PG&E's Public Safety Power Shutoff Program (PSPS Program) during extreme weather or wildfire conditions is new, but we have always been prepared for power outages.

PG&E suggests customers prepare for outages that could last longer than 48 hours. All of Valley Water's critical facilities have built-in backup power and contracts in place for fuel delivery.

Valley Water provides wholesale treated water to retailers, raw surface water to a select group of customers, and manages local groundwater basins. Groundwater and surface water users rely on their own equipment to access those supplies.

Valley Water and its Board of Directors are looking to the future to solve new challenges. We continue to search for opportunities to improve our reliability and resiliency. You can also prepare for an emergency and disaster. Santa Clara County's Office of Emergency Management has helpful information for residents.

Frequently Asked Questions

Question: What are the potential impacts to our water supply if PG&E shuts off power in Santa Clara County as part of its Community Wildfire Safety Program?

Valley Water has always had contingency plans in place to continue to deliver treated water and make groundwater available to our water retailers in the event of a power outage. Valley Water has built the necessary back-up power resources into its infrastructure. Permanent generators are connected to critical Valley Water facilities, which includes all the drinking water treatment plants, the water quality lab and multiple administration buildings. Valley Water also has several mobile generators of various sizes that can be quickly deployed to the field, where they may be needed. Our generators are also tested and maintained on a regular basis to be ready for service in case of an unplanned outage.

Question: In the event of an extended outage, how many days can Valley Water continue water delivery service using back-up power resources?

Several factors are involved in determining how long Valley Water can continue treated water delivery service, including time of year and water demand. In the event of the unlikely possibility of a total power loss throughout Santa Clara County, we have enough fuel on-site to run the generators for approximately four to six days. We also have contracts with fuel suppliers that could supplement our needs if necessary to extend our operations using backup power.

Question: Will water quality be impacted?

We do not anticipate an impact on water quality due to an extended power outage. Valley Water will continue to test and monitor our treated water and ensure it meets or exceeds all state and federal requirements and standards. There is a slight chance of a change in taste or odor due to optimizing the treatment process for running on generators. However, all treated water will be managed to ensure meeting of all state and federal requirements and standards.

Question: Would water sources into our treatment plants change during extended power outages?

Valley Water receives federal water from San Luis Reservoir and state water from the South Bay Aqueduct. The pumping plants providing water to Valley Water from San Luis and the South Bay Aqueduct have no back-up power. Some water from Lake Del Valle could be delivered by the South Bay Aqueduct via gravity, but Valley Water would primarily rely on in-county surface water from Anderson and Calero Reservoirs to provide the raw water to the treatment plants, as available at the time.

Question: How does Valley Water's groundwater management help during an emergency situation?

A key mission of Valley Water is ensuring local groundwater supplies are reliable. Groundwater basins in Santa Clara County can store vast amounts of water, much more than all ten surface water reservoirs combined. Because of this, these groundwater basins are the primary reserve that retailers draw upon more heavily during droughts or other emergencies. Our activities to replenish groundwater, deliver treated water, and conserve and recycle water help make sure local groundwater is reliable and available.

Question: I have a well, will I still be able to pump water during a power outage?

Pumps to extract water from wells typically rely on electricity for power. In those cases, the pump will not work during a power outage unless it is connected to an alternate source of power, like a generator. PG&E has several resources for what to do before, during and after a Public Safety Power Shutoff, including how to choose the right generator and tips on generator safety.

Question: What is Valley Water's contractual obligation as a wholesaler to provide continuous water supply to our retailers?

Our goal is to continue to deliver treated water and make groundwater available to our water retailers in the event of an extended power outage. We have the infrastructure and operational capacity to do so for an extended period of time. However, in the event of the circumstances beyond our control, Valley Water may be required to reduce or cease delivery.

Question: In the event of an extended power outage, what may be asked of you?

Valley Water will look to partner with Santa Clara County residents and water retailers in water conservation efforts if a large-scale power outage results in a regional emergency and water supply is limited.

Stay informed at ValleyWater.org

MEMORANDUM

FC 14 (08-21-19)

FROM: Rick L. Callender
Chief of External Affairs

DATE: September 3, 2019

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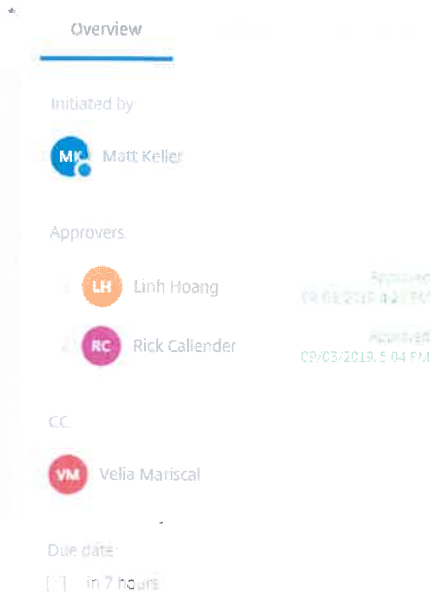

Report Name: Correspondence (open)

Correspond No	Rec'd By District	Rec'd By COB	Letter To	Letter From	Description	Disposition	BAO/ Chief	Staff	Draft Response Due Date	Draft Response Submitted	Writer Ack. Sent	Final Response Due Date
C-19-0219	08/23/19	08/23/19	All	PETER CHANG	Email from Peter Chang to the Board, dated 8.23.19, regarding Private Well Water Waste	Refer to Staff	Hawk	De La Piedra Duffy	08/31/19	08/30/19	n/a	09/06/19
C-19-0222	09/03/19	09/03/19	Varela	ANTHONY EULO City of Morgan Hill	Follow-up Email regarding grant funding for small water companies to assist with drinking water compliance.	Refer to Staff	Camacho	Taylor	09/11/19		n/a	09/17/19
C-19-0223	08/30/19	08/30/19	All	PAT FERRARO Silicon Vallely Pollution Prevention Center	Email regarding Harmful Algal Blooms (HAB) in Delta Water Supply.	Refer to Staff	Hawk	Yerrapotu	09/07/19		n/a	09/13/19