

November 2, 2018

SPECIAL MEETING NOTICE

WATER STORAGE EXPLORATORY COMMITTEE

Board Members of the Water Storage Exploratory Committee

Director Gary Kremen, Committee Chair
Director Richard P. Santos
Director John L. Varela

Staff Support of the Water Storage Exploratory Committee

Norma J. Camacho, Chief Executive Officer
Nina Hawk, Chief Operating Officer, Water Utility
Rick Callender, Chief of External Affairs
Stanly Yamamoto, District Counsel
Garth Hall, Deputy Operating Officer, Water Supply Division
Katherine Oven, Deputy Operating Officer, Water Utility Capital Division
Christopher Hakes, Deputy Operating Officer, Dam Safety & Capital Delivery Division
Jerry De La Piedra, Assistant Officer, Water Supply Planning & Conservation Unit
Cindy Kao, Imported Water Manager, Imported Water Unit
Melih Ozbilgin, Senior Water Resources Specialist, Imported Water Unit
Medi Sinaki, Senior Engineer – Water Quality
Bradly Arnold, Senior Engineer – Imported Water Unit
Tracy Hemmeter, Senior Project Manager, Water Supply Planning & Conservation Unit
Metra Richert, Senior Water Resources Specialist, Water Supply Planning & Conservation Unit

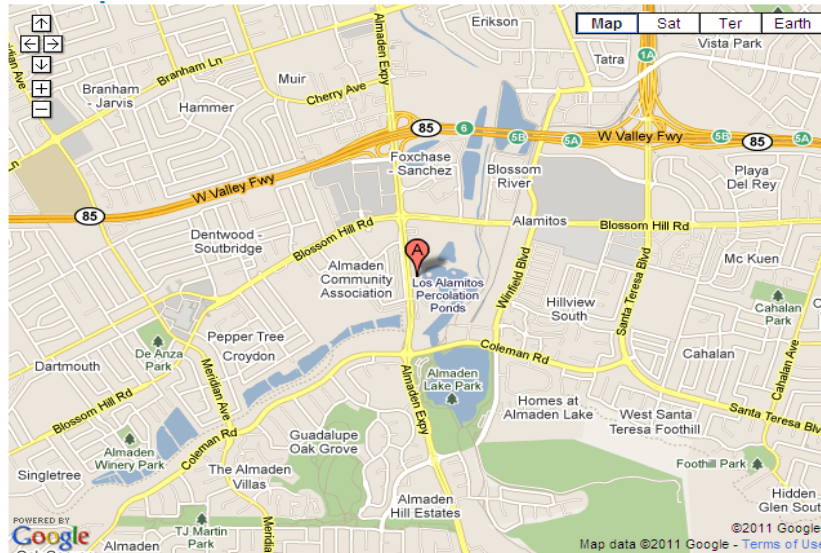
A regular meeting of the Santa Clara Valley Water District (SCVWD) Water Storage Exploratory Committee is to be held on **Wednesday, November 7, 2018, at 12:30 p.m.** in the Headquarters Building Boardroom located at the Santa Clara Valley Water District, 5700 Almaden Expressway, San Jose, California. Refreshments will be served.

Enclosed are the meeting agenda and corresponding materials. Please bring this packet with you to the meeting.

Enclosures



**Santa Clara Valley Water District - Headquarters Building,
5700 Almaden Expressway, San Jose, CA 95118**



From Oakland:

- Take 880 South to 85 South
- Take 85 South to Almaden Expressway exit
- Turn left on Almaden Plaza Way
- Turn right (south) on Almaden Expressway
- At Via Monte (third traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance

From Morgan Hill/Gilroy:

- Take 101 North to 85 North
- Take 85 North to Almaden Expressway exit
- Turn left on Almaden Expressway
- Cross Blossom Hill Road
- At Via Monte (third traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance

From Sunnyvale:

- Take Highway 87 South to 85 North
- Take Highway 85 North to Almaden Expressway exit
- Turn left on Almaden Expressway
- At Via Monte (third traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance

From San Francisco:

- Take 280 South to Highway 85 South
- Take Highway 85 South to Almaden Expressway exit
- Turn left on Almaden Plaza Way
- Turn right (south) on Almaden Expressway
- At Via Monte (third traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance

From Downtown San Jose:

- Take Highway 87 - Guadalupe Expressway South
- Exit on Santa Teresa Blvd.
- Turn right on Blossom Hill Road
- Turn left at Almaden Expressway
- At Via Monte (first traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance

From Walnut Creek, Concord and East Bay areas:

- Take 680 South to 280 North
- Exit Highway 87-Guadalupe Expressway South
- Exit on Santa Teresa Blvd.
- Turn right on Blossom Hill Road
- Turn left at Almaden Expressway
- At Via Monte (third traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance



Santa Clara Valley Water District Water Storage Exploratory Committee Meeting

Headquarters Building Boardroom
5700 Almaden Expressway
San Jose CA 95118

REGULAR MEETING AGENDA

**Wednesday, November 7, 2018
12:30 PM**

District Mission: Provide Silicon Valley safe, clean water for a healthy life, environment and economy.

All public records relating to an item on this agenda, which are not exempt from disclosure pursuant to the California Public Records Act, that are distributed to a majority of the legislative body will be available for public inspection at the Office of the Clerk of the Board at the Santa Clara Valley Water District Headquarters Building, 5700 Almaden Expressway, San Jose, CA 95118, at the same time that the public records are distributed or made available to the legislative body. Santa Clara Valley Water District will make reasonable efforts to accommodate persons with disabilities wishing to attend Board of Directors' meeting. Please advise the Clerk of the Board Office of any special needs by calling (408) 265-2600.

Note: The finalized Board Agenda, exception items and supplemental items will be posted prior to the meeting in accordance with the Brown Act.

Santa Clara Valley Water District
Water Storage Exploratory Committee
REGULAR MEETING
AGENDA

Wednesday, November 7, 2018

12:30 PM

Headquarters Building Boardroom

1. CALL TO ORDER:

1.1. Roll Call.

2. CLOSED SESSION

Anticipation of Litigation – Initiation of Litigation Pursuant to Government Code Section 54956.9(d)(4) - Four Potential Cases (Pacheco Reservoir Expansion Study)

2.1. District Counsel's Report

3. Time Open for Public Comment on any Item not on the Agenda.

Notice to the public: This item is reserved for persons desiring to address the Committee on any matter not on this agenda. Members of the public who wish to address the Committee on any item not listed on the agenda should complete a Speaker Form and present it to the Committee Clerk. The Committee Chair will call individuals in turn. Speakers comments should be limited to two minutes or as set by the Chair. The law does not permit Committee action on, or extended discussion of, any item not on the agenda except under special circumstances. If Committee action is requested, the matter may be placed on a future agenda. All comments that require a response will be referred to staff for a reply in writing. The Committee may take action on any item of business appearing on the posted agenda.

4. APPROVAL OF MINUTES:

4.1. Approval of Minutes.

[18-0951](#)

Recommendation: Approve the October 1, 2018, Meeting Minutes.

Manager: Michele King, 408-630-2711

Attachments: [Attachment 1: 100118 WSEC DRAFT Mins](#)

Est. Staff Time: 5 Minutes

5. ACTION ITEMS:

- 5.1. Annual Operations of the Anderson Reservoir System. [18-0954](#)
Recommendation: Receive update on the past year's operation of the Anderson Reservoir system and provide comments.
Manager: Kurt Arends, 408-630-2284
Est. Staff Time: 5 Minutes
- 5.2. Anderson Operations During Construction. [18-0963](#)
Recommendation: Receive an update on the construction period effect on water supply and operations of the Anderson Dam Seismic Retrofit Project.
Manager: Kurt Arends, 408-630-2284
Est. Staff Time: 15 Minutes
- 5.3. Calero Reservoir Expansion Analysis. [18-0952](#)
Recommendation: Receive information on analyses performed to date for a potential expansion of Calero Reservoir.
Manager: Christopher Hakes, 408-630-3796
Attachments: [Attachment 1: Report](#)
[Attachment 2: PowerPoint](#)
Est. Staff Time: 10 Minutes
- 5.4. Update on Proposed Sites Reservoir Project. [18-0959](#)
Recommendation: A. Receive and discuss information on the Sites Reservoir Project; and
B. Provide feedback and direction regarding communication with the Board.
Manager: Garth Hall, 408-630-2750
Attachments: [Attachment 1: Sites Reservoir Project Map](#)
[Attachment 2: Sites Authority and Reservoir Committee Structure](#)
[Attachment 3: Staff PowerPoint](#)
Est. Staff Time: 10 Minutes
- 5.5. Update on Los Vaqueros Reservoir Expansion Project (LVE Project). [18-0977](#)
Recommendation: Receive and discuss information on Los Vaqueros Reservoir Expansion Project (LVE Project).
Manager: Garth Hall, 408-630-2750
Est. Staff Time: 5 Minutes

- 5.6. Investigation of Out-of-County Groundwater Storage and Banking Opportunities. [18-0955](#)
Recommendation: Receive and discuss information on staff investigation of groundwater storage and banking opportunities.
Manager: Garth Hall, 408-630-2750
Est. Staff Time: 5 Minutes
- 5.7. Update on San Luis Reservoir Expansion. [18-0956](#)
Recommendation: Receive and discuss information on San Luis Reservoir expansion.
Manager: Garth Hall, 408-630-2750
- 5.8. Pacheco Reservoir Expansion Project Update [18-0953](#)
Recommendation: This is an information only item and no action is required.
Manager: Christopher Hakes, 408-630-3796
Est. Staff Time: 5 Minutes
- 5.9. Review Water Storage Exploratory Committee Work Plan and the Committee's Next Meeting Agenda. [18-0957](#)
Recommendation: Review the Committee's Work Plan to guide the Committee's discussions regarding policy alternatives and implications for Board deliberation.
Manager: Michele King, 408-630-2711
Attachments: [Attachment 1: WSEC Work Plan](#)
Est. Staff Time: 5 Minutes

6. Clerk Review and Clarification of Committee Requests.

This is an opportunity for the Clerk to review and obtain clarification on any formally moved, seconded, and approved requests and recommendations made by the Committee during the meeting.

7. ADJOURN:

7.1. Adjourn.

File No.: 18-0951

Agenda Date: 11/7/2018
Item No.: 4.1.

COMMITTEE AGENDA MEMORANDUM

Water Storage Exploratory Committee

SUBJECT:

Approval of Minutes.

RECOMMENDATION:

Approve the October 1, 2018, Meeting Minutes.

SUMMARY:

A summary of Committee discussions, and details of all actions taken by the Committee, during all open and public Committee meetings, is transcribed and submitted for review and approval.

Upon Committee approval, minutes transcripts are finalized and entered into the District's historical records archives and serve as historical records of the Committee's meetings.

ATTACHMENTS:

Attachment 1: 100118 Water Storage Draft Minutes

UNCLASSIFIED MANAGER:

Michele King, 408-630-2711

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SANTA CLARA VALLEY WATER DISTRICT (SCVWD)
WATER STORAGE EXPLORATORY COMMITTEE

DRAFT MINUTES

**MONDAY, OCTOBER 1, 2018
9:30 AM**

(Paragraph numbers coincide with agenda item numbers)

A special meeting of the Water Storage Exploratory Committee (Committee) was held on October 1, 2018, in the Headquarters Building Boardroom at the Santa Clara Valley Water District, 5700 Almaden Expressway, San Jose, California.

1. CALL TO ORDER

A special meeting of the Santa Clara Valley Water District Water Storage Exploratory Committee was called to order by Chair Gary Kremen at 9:33 a.m. on October 1, 2018.

1.1 ROLL CALL

Board Members in attendance were: Director Gary Kremen-District 7, Director Richard P. Santos-District 3, and Director John L. Varela-District 1.

Staff members in attendance were: Glenna Brambill, Norma Camacho, Jerry De La Piedra, Anthony Fulcher, Christopher Hakes, Garth Hall, Nina Hawk, Tracy Hemmeter, Brian Hopper, Cindy Kao, Bill Magleby, Katherine Oven, Metra Richert, Eli Serrano and Sue Turner.

Committee Chairperson Kremen confirmed that the Committee would adjourn to Closed Session for consideration of Item 2.

2. CLOSED SESSION:

ANTICIPATION OF LITIGATION – INITIATION OF LITIGATION PURSUANT TO GOVERNMENT CODE SECTION 54956.9(d)(4) – FOUR POTENTIAL CASES (PACHECO RESERVOIR EXPANSION STUDY)

Upon return to Open Session, the same Committee members and staff were present.

2.1 DISTRICT COUNSEL’S REPORT:

Mr. Brian Hopper Senior Assistant District Counsel, reported that regarding Item 2, the Committee met in Closed Session with all members present, and took no reportable action.

3. TIME OPEN FOR PUBLIC COMMENT ON ANY ITEM NOT ON AGENDA

There was no one present who wished to speak.

4. APPROVAL OF MINUTES

4.1 APPROVAL OF MINUTES

It was moved by Director John L. Varela, seconded by Director Gary Kremen, and unanimously carried to approve the minutes of the August 15, 2018, Meeting Santa Clara Valley Water District (SCVWD) Water Storage Exploratory Committee as presented.

5. ACTION ITEMS

5.1 PACHECO RESERVOIR EXPANSION PROJECT TIMELINE OVERVIEW

Mr. Christopher Hakes reviewed the materials as outlined in the agenda item.

The Committee discussed Proposition 1 flexibility, EIR, and Pacheco Creek.

No action taken.

5.2 CALIFORNIA WATER COMMISSION – PROPOSITION WATER STORAGE INVESTMENT PROGRAM FUNDING PROCESS UPDATE

Mr. Christopher Hakes reviewed the materials as outlined in the agenda item.

The Committee discussed early funding potentials and other funding sources.

Mr. Garth Hall and Ms. Cindy Kao were available to answer questions.

No action taken.

5.3 GOVERNANCE REPRESENTATION FOR BOTH SITES RESERVOIR AND LOS VAQUEROS RESERVOIR

Ms. Cindy Kao and Ms. Metra Richert reviewed the materials as outlined in the agenda item.

The Committee discussed potential scenarios for both reservoirs, JPA Board, leadership roles, governance structures, costs and storage capacity.

Ms. Norma Camacho, Mr. Jerry De La Piedra, Mr. Garth Hall, Ms. Nina Hawk and Ms. Tracy Hemmeter were available to answer questions.

It was moved by Director Gary Kremen, seconded by Director John L. Varela, and unanimously carried to recommend that the Board consider approving a cost-share agreement of approximately \$200,000 for the LVE project.

5.4 CALERO RESERVOIR EXPANSION ANALYSIS

Chair Kremen tabled this item to the next meeting.

5.5 REVIEW OF 2018 WATER STORAGE EXPLORATORY COMMITTEE WORK PLAN AND THE COMMITTEE'S NEXT MEETING AGENDA

Ms. Glenna Brambill reviewed the materials as outlined in the agenda item.

The next meeting should be scheduled the last week of October 29, 2018 or first week of November 5, 2018 with the following agenda items:

- Closed Session Item (Litigation Status Update)
- Calero Reservoir Expansion Analysis
- Anderson Winter Operations
- Water Storage Discussion
- Pacheco Update

6. CLERK REVIEW AND CLARIFICATION OF COMMITTEE ACTIONS

Ms. Glenna Brambill noted there was one action item for Board consideration under Agenda Item 5.3.

Committee Action:

The Water Storage Exploratory Committee unanimously approved recommending that the Board consider approving a cost-share agreement of approximately \$200,000 for the LVE project.

7. ADJOURNMENT

Chair Director Gary Kremen adjourned the meeting at 11:28 a.m.

Glenna Brambill
Board Committee Liaison
Office of the Clerk of the Board

Approved:

File No.: 18-0954

Agenda Date: 11/7/2018
Item No.: 5.1.

COMMITTEE AGENDA MEMORANDUM

Water Storage Exploratory Committee

SUBJECT:

Annual Operations of the Anderson Reservoir System.

RECOMMENDATION:

Receive update on the past year's operation of the Anderson Reservoir system and provide comments.

SUMMARY:

In October of 2017, following an extremely wet winter, the Board directed staff to operate the Anderson Reservoir system following a 40% exceedance rule curve for the 2017/2018 winter season to reduce the probability that Anderson Reservoir storage levels would exceed the seismic restriction limits set by the State Division of Safety of Dams (DSOD). As a result of the previous winter rains, water supplies throughout the state had recovered and groundwater levels in Santa Clara County had returned to pre-drought levels. The available water supplies reduced pressure on local storage to meet local water supply needs and this allowed for a lower operating rule curve on Anderson Reservoir without posing a significant impact to water supply.

However, the winter of 2017/2018 produced below normal rainfall throughout the state and locally. As a result, local reservoir storage is only a third of capacity. Storage levels in Anderson Reservoir never reached the rule curve to require releases. Due to the low water levels late in the season, imported water from the Central Valley Project was pumped into Anderson Reservoir to provide enough cold water to maintain a stream recharge program through the summer and provide cold water habitat for fish. Even with additional water being pumped into the reservoir, water levels were never adequate to allow the County to open the reservoir for recreational boating use.

Due to a dry winter and the need to provide adequate water supply for the community, staff recommends operating the Anderson Reservoir system following a 50% exceedance rule curve. This represents a 50% probability that reservoir storage levels will reach the DSOD seismic restriction. By increase the rule curve from 40% to 50% exceedance levels, should early season rains come followed by dryer conditions, up to an additional 10,000 acre-feet of water could be captured which would otherwise be released following the 40% rule curve. Revising the rule curve does not affect the restricted storage level of the reservoir. It is recommended that the 50% exceedance rule curve be followed until the construction of the Anderson Dam Seismic Retrofits. If conditions change that would warrant a change in the rule curves, staff will return to the Board for further discussion and direction

File No.: 18-0954

Agenda Date: 11/7/2018
Item No.: 5.1.

ATTACHMENTS:

None.

UNCLASSIFIED MANAGER:

Kurt Arends, 408-630-2284

File No.: 18-0963

Agenda Date: 11/7/2018

Item No.: 5.2.

COMMITTEE AGENDA MEMORANDUM

Water Storage Exploratory Committee

SUBJECT:

Anderson Operations During Construction.

RECOMMENDATION:

Receive an update on the construction period effect on water supply and operations of the Anderson Dam Seismic Retrofit Project.

SUMMARY:

The purpose of this agenda item is to present an update on the potential effect to water supply and operations during the construction of the Anderson Dam Seismic Retrofit Project (Project).

Project Background

In 2011, the District completed a seismic study of Anderson Dam, which indicated that material at the base and foundation of the dam embankment could weaken due to liquefaction in a 7.25 magnitude earthquake [the maximum credible earthquake (MCE)] on the Calaveras Fault, located approximately 1.2 miles from the dam. Such an event could significantly deform the dam embankment, risking an uncontrolled release from Anderson Reservoir. The 2011 study also indicated that an MCE could trigger fault offset on the conditionally-active Coyote Creek-Range Front fault zone located in the vicinity of the dam, which would damage the existing outlet pipe, precluding safe drainage of the reservoir.

The District initiated the Anderson Dam Seismic Retrofit Project in 2012 to address the seismic deficiencies at the dam and to meet the design requirements of the Federal Energy Regulatory Commission (FERC) and the California Department of Water Resources, Division of Safety of Dams (DSOD).

Between 2014 and 2016, detailed geotechnical and geologic investigations were performed on and around the dam embankments to further inform the seismic retrofit design. In December 2016, staff presented the findings from these investigations to the Board and recommended that deconstruction and replacement of most of the existing dam would be necessary to address the dam's deficiencies. Because of the extensive earthwork to dismantle and rebuild the dam, the reservoir would be drained through two consecutive winters of construction.

In January 2017, based on the new findings related to the impact of the seismic faults under the dam, the District further lowered the water level an additional 10 feet (to 55 feet below the dam crest) after consulting with DSOD and FERC. This seismic restriction will impact the operation and benefits of

Anderson Reservoir until the seismic retrofit project is completed.

Construction Sequence

A proposed construction sequence was developed as part of the 30% design and presented to the Board on January 23, 2018. Though subject to refinement as design progresses, the complex excavation and reconstruction of the Anderson embankment may take five years to complete. The first two years of construction, Years 1 and 2, will be construction of the temporary diversion tunnel under the dam and dewatering of the reservoir. At present, it is assumed that permit conditions will limit construction activity at the dam to the period between April and October of each year. Due to the volume of embankment excavation, the existing embankment cannot be removed and reconstructed within one 6-month period. Therefore, embankment excavation and reconstruction will have to be performed in steps, and will require three sequential "April-October" construction periods to complete the embankment retrofit. In the winter of years 3 and 4, the "interim" dam height will be at Elevation 570 feet, about 80 feet lower than the existing dam. After rainstorms, a diversion tunnel will convey reservoir inflows directly to Coyote Creek to protect the interim dam and maintain the reservoir in a dewatered state.

Anderson Reservoir Operations During Construction

As described in the previous section, reservoir operating rule curves will have to be implemented during the Project's construction to reduce the risk of overtopping an interim dam embankment in the third and fourth year of construction as well as to minimize the potential for flooding of Coyote Creek. Detailed stochastic analyses have been performed to develop these rule curves. A proposed rule curve for reservoir operations during construction is based on a stochastic model which generated over 10,000 synthetic rain years to ascertain the risk of overtopping the interim dam during the winter seasons. If this rule curve is implemented, there will be a 1 in 2,500 (0.04%) chance (each winter) of watershed runoff exceeding the interim dam's winter operating level in the third and fourth years of construction. DSOD, FERC, and the independent Board of Consultants are reviewing the results of the studies performed to date.

The result of this operations plan during construction is that there will be little or no opportunity to capture or store water for water supply purposes during construction years three and four. This has the potential to impact the District's annual water supply as well as its operational reliability.

Anderson System and Annual Water Supply

The Anderson system, comprised of both Anderson and Coyote Reservoirs, is a key component of both the annual water supply portfolio and to the District's reliable operations. The total storage capacity of the two reservoirs, without seismic restrictions, is 113,617 acre-feet (AF), larger than all the other District surface reservoirs combined. The Anderson system also has the District's largest water rights totaling over 115,840 AF, over half of the District's local water rights. Prior to the seismic restrictions, the Anderson system could contribute over 80,000 AF of annual water supply in a wet year. In addition to local water supply, the large capacity of the reservoirs also allows capacity to carry water over from one year to the next to help guard against the impacts of dry years. These benefits have already been reduced by the seismic restrictions placed on Anderson and Coyote dams which limits their combined storage capacity to 64,935 AF; 52,553 AF and 12,382 AF, respectively. These seismic restrictions have reduced the potential water supply yield, limiting it to

around 45,000 AF.

The impact on water supply of not having Anderson reservoir available during construction would depend on the type of year being considered. In extremely dry years, the water supply benefits of local storage are reduced due to the lack of local rainfall. In this scenario, the impact of Anderson construction is minimized and the District would operate under its established drought response plans. In an extremely wet year, the lack of storage in Anderson Reservoir to capture local runoff would be a large lost opportunity to capture local water, but the plentiful local and imported water supply would allow the District to meet the County's water supply needs for that year, even without Anderson. The missed opportunity to capture water in Anderson is the lost supply which could have been stored and carried over to future, possible dry years.

The most significant short term impact of Anderson construction on annual water supply is in a near typical rainfall year when Anderson supplies would be helping to meet that year's water supply demands. It is estimated that the Anderson system could provide approximately 26,000 AF in this scenario. Looking at the water balance for a single year, this could represent a single year shortfall in supplies relative to demands. This shortfall could be made up through additional groundwater pumping, pull-back from the Semitropic groundwater storage bank, securing additional imported water supplies, increased conservation, or a combination of these. If this scenario was to repeat itself over the three-year construction period of Anderson Dam (years three, four and five), the cumulative shortfall in supplies could equal as much as 78,000 AF of supply needed to meet demands. Depending on how the District chose to make up for the shortfall, the potential impacts could include lower groundwater levels, reduced storage in Semitropic, and/or increased costs.

Depending on the local and statewide water supply situation near the start of construction, some precautionary steps may be taken to prepare for this possible shortfall. This may include increased banking in Semitropic, arranging for additional storage in San Luis and/or Los Vaqueros Reservoirs, securing additional short term water transfers, or other such actions.

Anderson System and Operational Reliability

The primary source of supply to the District's water treatment plants is imported from the State's South Bay Aqueduct (SBA) in the north and the federal Central Valley Project (CVP) in the South. Both of these major water supplies experience outages which interrupt deliveries into Santa Clara County and the Anderson system is key to reliable raw water deliveries. Being connected by pipeline to the imported water supply at the Coyote Pumping Plant, Anderson Reservoir can be used to not only store imported water from the CVP, but also deliver stored water from Anderson Reservoir to the District's in-county pipeline distribution system delivering raw water to the water treatment plants as well as groundwater recharge facilities and other surface water users. When there is an interruption in CVP deliveries, the District is able to switch to taking water from Anderson Reservoir without an interruption in deliveries to the treatment plants. Because Anderson offers a large volume of local storage, the District can sustain this operation for a significant amount of time which could accommodate an extended interruption in CVP deliveries. Anderson is the emergency supply in case of a catastrophic event, such as an earthquake, which cuts off all imported supplies for a significant length of time.

Anderson can also provide temporary relief from poor water quality events such as algae blooms in San Luis Reservoir by blending water from Anderson Reservoir with CVP water going to the water treatment plants to improve treatability. Anderson also provides critical recharge to the Coyote Valley, environmental and fisheries flows to Coyote Creek and carries over excess water supplies from one year to the next to help guard against droughts.

During construction of the Anderson Dam Project, without access to this additional local storage, the reliability of the raw water system will be reduced. In the event of a loss of imported water supplies from San Luis Reservoir, the only other local source of water that can be used to supply the water treatment plants is from Calero Reservoir. However, current seismic restrictions on Calero Reservoir limit storage to 45% of capacity or about 4,414 AF. With a desired emergency storage of 4,000 AF, Calero currently only provides about 400 AF of active storage volume. Combining this with an outlet capacity of about 50 cubic feet per second (CFS), the current reservoir configuration offers limited relief as a backup water supply to the treatment plants or in helping to mitigate water quality issues. With limited flows from Calero, the only supply of raw water to the treatment plans would be from the South Bay Aqueduct. Depending on the time of year, the SBA cannot provide enough supply to meet the District's treated water contract amounts. Therefore, during Anderson Dam construction, an interruption in CVP deliveries or a significant water quality event would likely result in decreased treated water deliveries from the treatment plants.

The risk of Anderson Dam construction to raw water reliability could be partially mitigated by completing the construction of the Calero Dam Seismic Retrofit Project before dewatering Anderson reservoir. This would restore the capacity of Calero reservoir to 9,738 AF and increase the outlet capacity from 50 cfs to up to 100 cfs. Under this condition, if there were to be an interruption in CVP deliveries during the construction of Anderson Dam, Calero reservoir could provide sufficient flow for several weeks, when combined with SBA deliveries, to meet treated water demands and minimize the impact to other raw water uses.

Conclusion

A fully usable Anderson Reservoir is critical to the long-term water supply and reliability of water deliveries to the valley. The seismic restriction currently imposed on the dam has significantly limited the benefits of this local storage facility and it is essential that the dam, spillway and outlet are improved as soon as possible, for public safety as well as water supply and reliability.

During construction of the Dam Retrofit Project, annual water supply will likely be reduced. Any impact to meeting annual water demands can be mitigated through a combination of groundwater pumping, pull-back from out-of-County storage, securing additional imported water supplies, or increased conservation.

Operational reliability will also be impacted during construction. Without the large storage of local supply available for immediate use, there will be a greater reliance on imported supplies. An interruption in those supplies, either planned or unplanned, may result in the District's Retail customers switching to alternative supplies such as groundwater or the Hetch Hetchy system. This risk could be partially mitigated by completing the Calero Dam Seismic Retrofit Project before dewatering Anderson Reservoir. Regardless of any actions taken, staff will be coordinating closely

with our retailers prior to and during construction.

Staff will present a draft framework for mitigating potential risks to the District water supply and operational reliability. The draft framework will identify potential risks, variables and mitigation measures which could be considered. Based on this framework, staff will bring forward specific plans and recommendations for consideration before the start of construction when more is known about the water supply situation.

ATTACHMENTS:

The PowerPoint will be available on the day of the meeting.

UNCLASSIFIED MANAGER:

Kurt Arends, 408-630-2284

File No.: 18-0952

Agenda Date: 11/7/2018
Item No.: 5.3.

COMMITTEE AGENDA MEMORANDUM

Water Storage Exploratory Committee

SUBJECT:

Calero Reservoir Expansion Analysis.

RECOMMENDATION:

Receive information on analyses performed to date for a potential expansion of Calero Reservoir.

SUMMARY:

A recent informal Board member request (IBMR) requested staff to evaluate the possibility of raising the height of Calero Dam to expand Calero Reservoir's storage capacity.

Background

Completed in 1935 and constructed with compacted earthen materials, Calero Dam is 840 feet-long and 90 feet high. Calero Dam creates a reservoir that stores 9,934 acre-feet of water with a surface area of approximately 347 acres at full capacity. The dam is located on Calero Creek in unincorporated Santa Clara County, approximately 12 miles southwest of downtown San Jose. The dam and reservoir are bounded by McKean Road to the north and Calero County Park to the south.

In 2012, a seismic evaluation of the dam determined the need to modify the facility to provide seismic stability from earthquake events. Accordingly, the California Department of Water Resources Division of Safety of Dams (DSOD) mandated operational restrictions, limiting reservoir storage to 46 percent of its normal capacity. A retrofit of the 80-year-old dam and associated facilities is necessary to address seismic safety concerns, satisfy District operational requirements, remove the interim storage restriction, and restore normal water supply capacity.

Calero Dam Seismic Retrofit Project Status

The Calero Dam Seismic Retrofit Project (Project) was initiated in Fiscal Year 2013. The Project is currently at the 60% design stage. A Notice of Preparation was published in June 2018 to comply with the California Environmental Quality Act (CEQA) requirements, and a scoping meeting for the Project's EIR was held on July 18, 2018. Project construction is anticipated to begin in 2020 or 2021, and the current estimated construction cost is \$90 million - \$100 million, with a total Project cost estimate of \$125M.

Analysis of Reservoir Expansion

In 2016, at the request of the District, the Program Management Consultant, Black & Veatch, performed a conceptual analysis of increasing the height of Calero Dam to expand the reservoir's storage capacity. The final draft version of this report is provided as Attachment 1. The analysis was

based on a 30-foot increase of the reservoir's water surface elevation, which would add approximately 14,000 acre-feet (AF) of storage capacity, yielding a total reservoir storage capacity of about 24,000 AF.

Raising the dam to accommodate a 30-foot increase in the reservoir's water surface elevation (WSEL) would require the following:

1. A new levee constructed along the southeast edge of the reservoir to protect the Cinnabar Hill Golf Club;
2. Modification to the dam's emergency spillway;
3. The relocation of almost 3 miles of McKean Road, including the construction of a 300-foot-long bridge along the east rim of the expanded reservoir.

The 2016 conceptual analysis included the following assumptions:

1. All elements of the seismic retrofit work would be completed;
2. A reservoir expansion would not require replacement or significant re-work of existing infrastructure; for example, the outlet works replaced as part of the seismic retrofit would have sufficient capacity to meet (DSOD) emergency drawdown requirements.
3. The raising of the main dam embankment and the auxiliary dam embankment would not require a full replacement of either embankment;
4. The District's water system pumps would have adequate capacity to pump imported or local water into a raised Calero Reservoir.

Preliminary Cost of Calero Reservoir Expansion

Black & Veatch prepared an opinion of probable project cost (OPPC) for a Calero Reservoir expansion based on necessary embankment and associated infrastructure improvements. The OPPC for the expansion was \$200 million (2016 dollars), with earthwork for the dam raises, two new levees to contain the larger reservoir, necessary property acquisition, and the relocation of McKean Road as the primary cost drivers. A \$200M expansion project to gain 14,000 additional acre-feet of storage would represent an expansion cost of \$14,300 per acre-foot of storage capacity. This estimated unit price is for project construction only and does not include any project life-cycle costs.

Estimated Schedule Impacts: Calero Retrofit vs. Calero Expansion

Table 1 presents estimated schedules for including some aspect of a potential Calero Reservoir expansion into the current Project effort, or undertaking a separate and parallel effort to plan and design for reservoir expansion. These are described in greater detail below:

1. For baseline purposes, Option A presents the anticipated schedule for proceeding with only the current seismic retrofit work on Calero. The CEQA process is anticipated to be completed in 2020, and construction would begin in 2021.
2. For Option B, only the seismic retrofit work would be constructed in the near term. However, the Project's CEQA document would be expanded to include programmatic-level analysis of future reservoir expansion impacts. Additional staff resources will be required to initiate and

manage another consultant to undertake the additional engineering and CEQA effort. The hiring of additional staff, the development of a Request for Proposal (RFP), the selection of a new consultant, and negotiation of the consultant services agreement will take approximately 2 years. This would be followed by 2 years of project development and pre-design to perform a programmatic-level impact analysis. The expanded CEQA document would be completed around 2024 and construction of the retrofit work would be anticipated to begin in 2026.

Preparing a programmatic-level analysis of environmental impacts for the proposed reservoir expansion now would still require preparation of a subsequent or supplemental CEQA document in the future if the District proceeded with an expansion project. Additional permits specific to the expansion project would also have to be negotiated and secured before the expansion could be constructed.

Option B would provide the District the opportunity to disclose its intent to expand Calero Reservoir well in advance of the actual project. This could generate a significant volume of comments from the public, which could extend the timeline for preparing the Final EIR, and thus could delay the seismic retrofit work. Delays to the start of construction would increase construction costs by about 3% per year of delay.

3. For Option C, the Project's CEQA document would be expanded to include a detailed, project-level analysis of future reservoir expansion impacts, and all necessary permits for both seismic retrofit and reservoir expansion would be secured. However, only the seismic retrofit work would be constructed initially, and the reservoir expansion would be undertaken at a later time.

A project-level CEQA document for reservoir expansion would result in a significant delay to addressing the dam's existing seismic deficiencies as mandated by DSOD. The District would have to obtain approval of this delay from DSOD before proceeding with this option.

Compared to the baseline (Option A), it is estimated that an additional 6-7 years of detailed project development and up to 60% design completion of reservoir expansion elements would be necessary to prepare a defensible project-level CEQA document. This would include 2 years to secure approval for the schedule change from DSOD; the hiring of additional staff; preparation of an RFP; and the subsequent effort to select consultants and negotiate services agreements. As with Option B, Option C would provide the District an opportunity to disclose its intent to expand Calero Reservoir well in advance of the actual project. As described above in Item 2, this could trigger significant reactions from the public and could extend the timeframe for completing the CEQA process. It's estimated that the expanded CEQA document would be completed in 2026-2027. Another 3 to 4 years of permit negotiation would likely follow to secure all the permits for both seismic retrofit and reservoir expansion work. For this option, construction of the retrofit work would be anticipated to begin in 2031 or 2032.

Permits that are secured for project construction are valid for a limited period of time (usually 5 years). If the District were to construct only the seismic retrofit work first (a 3-year estimated timeline), it would have to begin the reservoir expansion construction soon thereafter to avoid having to re-negotiate the permits for that work.

4. In Option D, the reservoir expansion would be combined with the seismic retrofit work. As with Option C, such an approach would first require DSOD approval because it would significantly delay the repair of seismic deficiencies in the existing dam. If DSOD approval was granted, and the District proceeded down this path, the design work on the seismic retrofit elements would be temporarily halted to allow for full development and analysis of dam modifications to expand the Calero Reservoir capacity. The design effort would then be restructured to combine all elements of seismic retrofit and reservoir expansion.

The likely schedule for completion of Option D would mirror that of Option C, with an estimated start date for construction in the early 2030s.

Based on a 3% annual increase in construction costs, and using a cost of \$300M (2018 dollars) for the combined seismic retrofit and reservoir expansion construction, a construction start date in 2029 would inflate the construction cost estimate to approximately \$420M.

5. In Option E, the seismic retrofit Project work would continue as planned, and a separate effort would be undertaken to further the concept of Calero Reservoir expansion. As with Options C and D, additional staff resources would be required and consultant services would have to be secured to undertake this work. If this separate effort was budgeted to begin in FY2020, the timeframe of key milestones would be similar to Options C and D. Under this scenario, construction of the reservoir expansion would begin in the early 2030s.

| Table 1. Preliminary Schedule for Calero Dam Retrofit and Expansion Options | | | | |
|--|--|--------------------------------|--|--|
| | Calero Dam Project Options | Certified CEQA Document | Completion of Design and Permitting | Estimated Start of Construction |
| A | Seismic Retrofit Project Only (baseline) | 2020 | 2021 | 2021 |
| B | Seismic Retrofit Project only. Expand CEQA to include programmatic-level analysis for future reservoir expansion. | 2024 | 2025 | Retrofit: 2026 Expansion: TBD |
| C | Expand CEQA to include project-level analysis for future reservoir expansion and secure permits for both seismic retrofit and reservoir expansion work. Perform retrofit work first; expand reservoir at a later date. | 2026-2027 | 2029-2031 | Retrofit: 2031-2032 Expansion: TBD |
| D | Change Project objectives to combine seismic retrofit and reservoir expansion. | 2026-2027 | 2029-2031 | Retrofit: 2031-2032 Expansion: Same |
| E | Undertake a separate and parallel effort for reservoir expansion. | 2026-2027 | 2029-2031 | Retrofit: 2021 Expansion: 2031-2032 |

ATTACHMENTS:

- Attachment 1: Report
- Attachment 2: PowerPoint

UNCLASSIFIED MANAGER:

Christopher Hakes, 408-630-3796

SANTA CLARA VALLEY WATER DISTRICT
Calero Dam Seismic Retrofit Project

SCVWD Project No. 91864005
SCVWD Agreement No. A3555A
B&V PROJECT No. 176066

**CALERO RESERVOIR EXPANSION
CONCEPTUAL ANALYSIS**

Task Order 11.06.06

2/14/2017



Version History

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1 INTRODUCTION

At the request of the Santa Clara Valley Water District (District), an analysis for increasing the water surface elevation (WSEL) in Calero Reservoir was performed. The existing reservoir normal maximum WSEL is assumed to be the crest of the existing spillway at 486.8 ft (NAVD88). At this WSEL, the total storage in Calero Reservoir is 9,934 acre-feet (acre-ft or AF).

The analysis is based on a 30-ft increase in WSEL to EL 516 ft, which corresponds to an increase of approximately 14,000 acre-ft in total storage capacity. To achieve this increase in WSEL the existing dam and auxiliary dam crests would be raised to EL 530 ft, providing 14 ft of freeboard over the maximum storage pool. In addition, a new auxiliary dam would be constructed along the southeast edge of the reservoir to protect the Cinnabar Hill Golf Club, and the existing spillway would need to be modified. The raise would require the relocation of almost 3 miles of McKean Road, which would include constructing a new bridge, approximately 300 ft in length, along the east rim of the reservoir. In addition, approximately 1,700 ft of the existing Almaden-Calero Canal would need to be abandoned, and a pump station would need to be constructed immediately downstream of the main dam to allow flows from Almaden Reservoir to reach the raised Calero Reservoir.

Two spillway modification alternatives were analyzed:

- Alternative 1 requires a raise of the existing spillway crest and construction of an additional auxiliary dam; and,
- Alternative 2 requires infill of the existing spillway and construction a new spillway.

The analysis presented herein is not a feasibility assessment; it is a high-level conceptual analysis intended to provide an order-of-magnitude opinion of probable project cost for comparison with other water supply projects currently being evaluated by the District.

1.1 CONCEPTUAL ANALYSIS ASSUMPTIONS

The following assumptions were made as part of the analysis as defined by the scope of work:

1. Calero Dam Seismic Retrofit Project (CDSRP) improvements do not require replacement or significant rework of existing infrastructure for raise:
 - a. Outlet capacity has adequate capacity per California Division of Safety of Dams (DSOD) for higher reservoir elevation;
 - b. Outlet works/intake structure can be expanded vertically without replacement;
 - c. Outlet works valve located outside of downstream toe enlargement;
 - d. Buttress and drainage configurations within the main dam can accommodate future raise;
 - e. Right Abutment Seepage is adequately mitigated in Seismic Retrofit Project.
2. Raise of Auxiliary Dam is possible without replacement of existing structure;
3. Spillway structure will require major retrofit due to raise;

4. Updated dam break analysis would not be seen as fatal flaw due to greater consequences;
5. Additional fish passage measures are not required;
6. Increased capture of watershed runoff does not impinge upon water rights;
7. Pumps into a raised Calero have adequate capacity;
8. Additional relocation of historic structures not planned as part of reservoir raise; and,
9. Almaden-Calero canal will require re-location.

2 COST COMPARISON

Conceptual opinions of probable project cost (OPPC) were prepared for the two proposed alternatives, based on the necessary improvements and property acquisitions identified in Appendix 1. Earthwork is the primary cost driver for the dam raises, the two new auxiliary dams required to contain the larger reservoir, and the relocation of McKean Road.

Table 1: Conceptual Opinion of Probable Project Cost (OPPC)

| | ALTERNATIVE 1 | ALTERNATIVE 2 |
|---------------------------------------|--------------------------------|-------------------------------|
| | Raise Existing Spillway | Construct New Spillway |
| Grand Total OPPC | \$193.7 million | \$192.7 million |
| Additional Potential Storage (AF) | 14,000 | |
| Cost Per AF Additional Storage | \$13,837 | \$13,767 |

Note: costs presented in 2016 dollars.

As Table 1 shows, there is a negligible difference in cost between Alternative 1 and Alternative 2. Conceptual technical analyses for both alternatives can be found in Appendix 1.

3 CONCLUSIONS & RECOMMENDATIONS

Further modeling and analysis are recommended for both alternatives presented in this conceptual analysis. The escalated costs presented herein should be considered approximate and for comparison use only. Several assumptions were made during the course of this analysis, based on work associated with the ongoing Calero Dam Seismic Retrofit Project. These assumptions need to be validated after completion of the CDSRP. An updated dam break analysis will need to be performed, along with an analysis of the existing pumps' capability to operate under the increased head. The McKean Road re-alignment will need to be verified by a roadway engineer to ensure the alignment meets current road specifications. As part of the road re-alignment assessment, the location and clearance adequacy of the proposed bridge will need to be verified, and site-specific geotechnical and seismic considerations will need to be taken into account. The stream diversion channel requires further analysis to determine the appropriate channel size, shape, and rip-rap requirements for velocities anticipated in Calero Creek. The impacts to the Almaden-Calero Canal will need to be considered in more detail, and a pump station capable of maintaining flows from Almaden Reservoir to Calero Reservoir will need to be designed.

1 APPENDIX 1: TECHNICAL ANALYSIS OF ALTERNATIVES 1 AND 2

1.1 FREEBOARD CONSIDERATIONS

The planned Calero Dam raised crest elevation would provide approximately 14 ft of freeboard in the non-overflow section. Freeboard adequacy must be verified with both DSOD and Federal Energy Regulatory Commission (FERC) dam safety requirements.

1.2 RESERVOIR EVACUATION

As discussed in the Calero Dam Alternatives Report (GEI Consultants 2014), in order to comply with DSOD emergency drawdown criteria, the outlet system must be capable of:

1. Lowering the reservoir by 10 percent of the hydraulic head from the WSEL in 7 days; and
2. Evacuating the active storage in 90 days.

Under existing conditions, a 10 percent drawdown equates to lowering the reservoir by 9 ft (EL 486.8 to EL 477.5), which equates to approximately 2,800 acre-feet of storage. Emergency releases from the reservoir are made using the low level outlet for both the 10 percent drawdown and the remaining active storage down to the dead pool level (EL 394.9). The current storage above dead pool is 9,934 acre-feet.

Raising the WSEL results in additional total storage and larger drawdown volumes required to meet the DSOD drawdown criteria. A 10 percent drawdown from the raised WSEL equates to lowering the reservoir by 12 ft (EL 516 to 504.4 ft), which is equivalent to approximately 6,400 acre-feet of storage. The active storage would be approximately 24,000 acre-feet.

Compliance with DSOD guidance was checked for existing conditions and a WSEL of 516 ft with the existing outlet works. The findings are presented in Table A1-1. As shown, the existing outlet works do not meet DSOD requirements for all scenarios. The outlet works is planned to be modified during the Calero Dam Seismic Retrofit Project to meet DSOD requirements, considering a future increase in reservoir storage.

Table A1-1: Verification of Emergency Drawdown Criteria

| SCENARIO | 10% DRAWDOWN TIME (DAYS) | DRAWDOWN TO DEADPOOL TIME (DAYS) |
|--------------------------|--------------------------|----------------------------------|
| Existing WSEL (486.8 ft) | 6 | 28 |
| Raised WSEL (516 ft) | 11 | 47 |

1.3 RESERVOIR EXPANSION CONSTRUCTION COMPONENTS

To achieve an increase in WSEL to EL 516 ft the existing dam and auxiliary dam crests would be raised to EL 530 ft. In addition, a new auxiliary dam would need to be constructed along the southeast edge of the reservoir to protect the Cinnabar Hill Golf Club, and the existing spillway would need to be modified. A stream diversion would need to be cut to tie the expanded reservoir into Calero Creek. The Almaden-Calero Canal would need to be partially abandoned and a pump station constructed. Each of the construction components are described below. Figure A1-1 shows

a conceptual plan view of each of the components. Note that Alternative 1, with modifications to the existing spillway, is shown in the overall plan.

1.4 MAIN DAM RAISE AND AUXILIARY DAM RAISE

The main dam raise would be completed downstream of the existing dam to EL 530 ft. A stabilizing buttress would be completed on the upstream side of the existing dam to EL 480 ft. The upstream and downstream slopes of the raise and buttress would be 1V:2.5H. Figure A1-2 shows a conceptual profile view of the main dam raise with the proposed CDSRP modifications. The auxiliary dam would be raised to EL 530 ft, with slopes at 1V:2.5H. It is estimated that the main dam raise with upstream buttress would require approximately 740,000 cubic yards of fill and the auxiliary dam raise would require 220,000 cubic yards of fill, to achieve the new crest height of EL 530 ft.

1.5 GOLF COURSE AUXILIARY DAM AND STREAM DIVERSION

To protect the Cinnabar Hill Golf Course from inundation by the raised reservoir, an approximately 2,000 ft long auxiliary dam would be required along the southeast rim of the reservoir. Due to the construction of the Golf Course auxiliary dam, a diversion channel will be needed to connect the southeast portion of the reservoir to the existing stream channel of Calero Creek. The stream diversion channel would need to be lined with rip-rap to protect the adjacent auxiliary dam. Figure A1-3 shows the approximate extents of the proposed auxiliary dam and stream diversion. It is estimated that the Golf Course auxiliary dam would require 73,000 cubic yards of fill and the stream diversion would require a 30,000 cubic yard cut with approximately 19,000 cubic yards of rip-rap lining.



Figure A1-1: Calero Reservoir Expansion Conceptual Plan View

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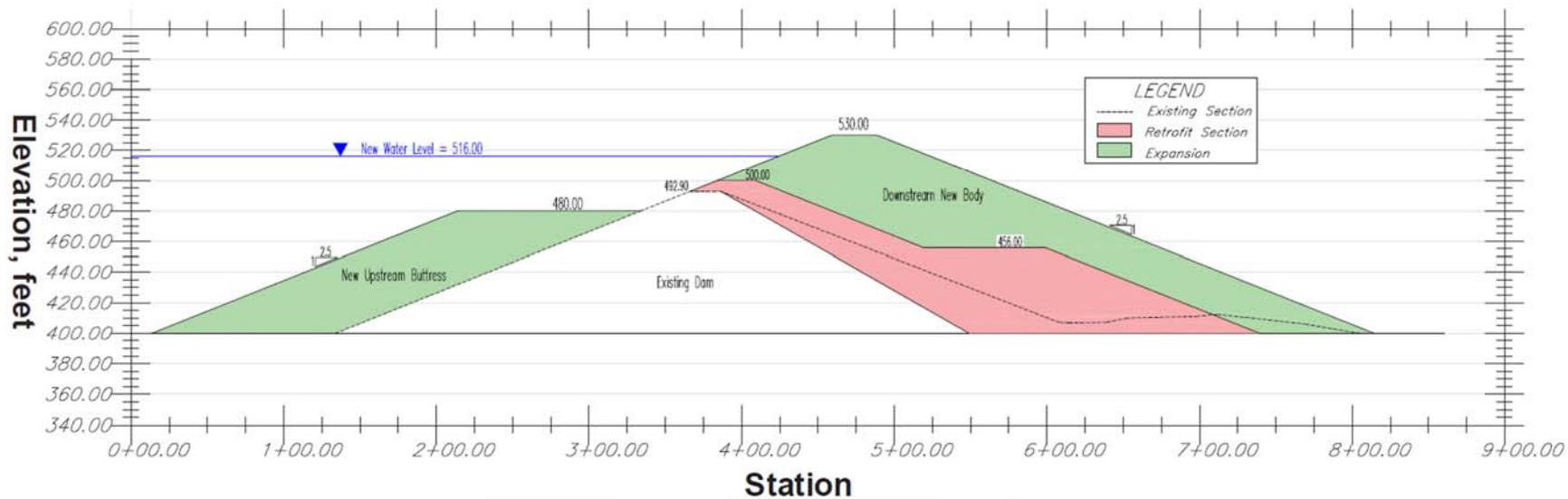


Figure A1-2: Main Dam Raise Profile View



Figure A1-3: Auxiliary Dam and Stream Diversion Extents

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1.6 SPILLWAY MODIFICATIONS

Two alternatives for spillway modifications were considered to achieve the proposed increase in WSEL.

1.6.1 Alternative 1

Alternative 1 requires raising the existing spillway crest to EL 516 ft, expanding the existing spillway with an approximately 1,000 cubic yard excavation, and constructing a 450 ft long auxiliary dam approximately 800 ft to the northeast of the existing spillway. It is estimated that the Alternative 1 auxiliary dam would require 17,000 cubic yards of fill. Figure A1-4 and Figure A1-5 show conceptual plan and profile views of Alternative 1, respectively.

1.6.2 Alternative 2

Alternative 2 requires abandoning the existing spillway by constructing an auxiliary dam at the spillway crest and constructing a new spillway approximately 800 feet to the northeast. It is estimated that the auxiliary dam would require 12,000 cubic yards of fill. The new spillway would require an approximately 2,500 cubic yard cut. Figure A1-6 and Figure A1-7 show conceptual plan and profile views of Alternative 2, respectively.



Figure A1-4: Alternative 1 Plan View

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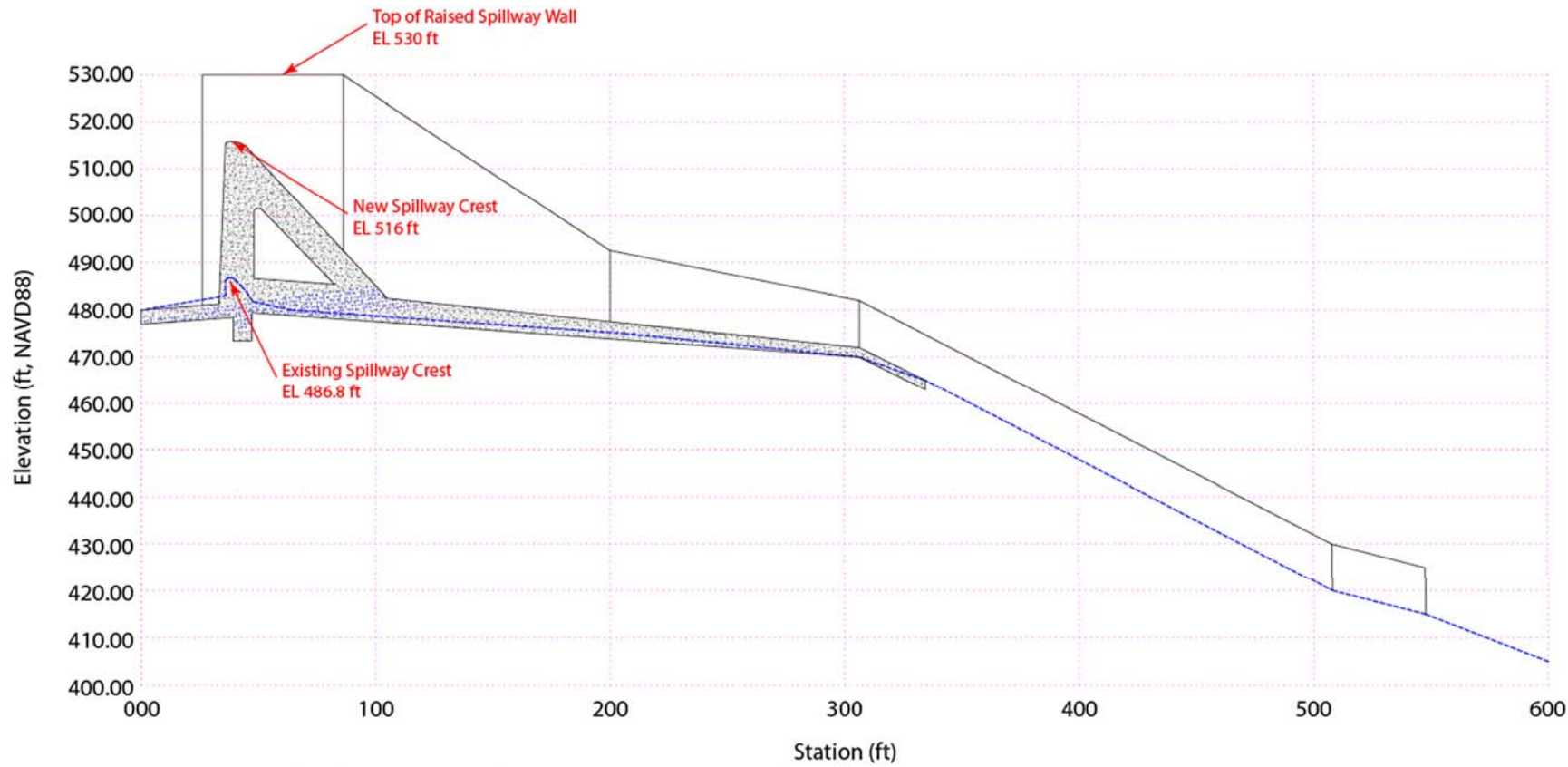


Figure A1-5: Alternative 1 Conceptual Profile View

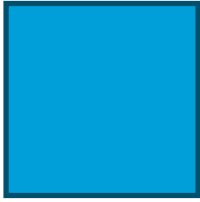


Figure A1-6: Alternative 2 Plan View

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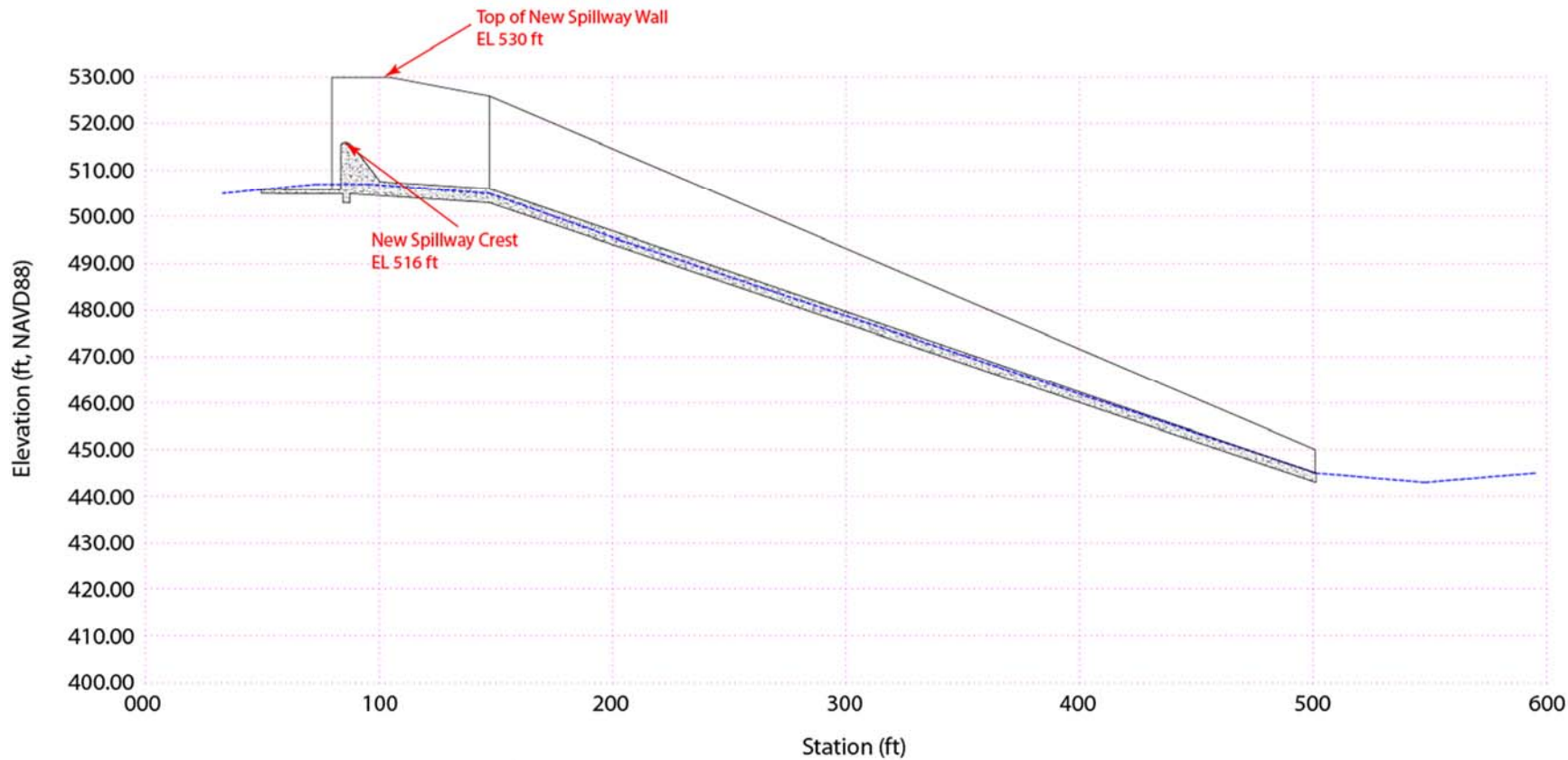


Figure A1-7: Alternative 2 Conceptual Profile View

1.7 ALMADEN-CALERO CANAL PUMP STATION

The raised WSEL of 516 ft would inundate approximately 1,000 ft of the existing Almaden-Calero Canal located on the left abutment of the dam, as shown in Figure A1-8. The total canal length is approximately 24,000 feet long with a slope of 0.000375 to 0.001. The canal alignment includes four concrete pipe siphons (48-inch and 36-inch diameter). The canal invert at Almaden Reservoir is El 529 and the canal invert is at EL 490 ft when it reaches Calero Dam. To allow flows to continue between Almaden Reservoir and Calero Reservoir, a pump station would need to be constructed downstream of Calero Dam. The pump station would need to operate at approximately 150 cfs with approximately 30 ft of head. Figure A1-8 shows the proposed location of the pump station.

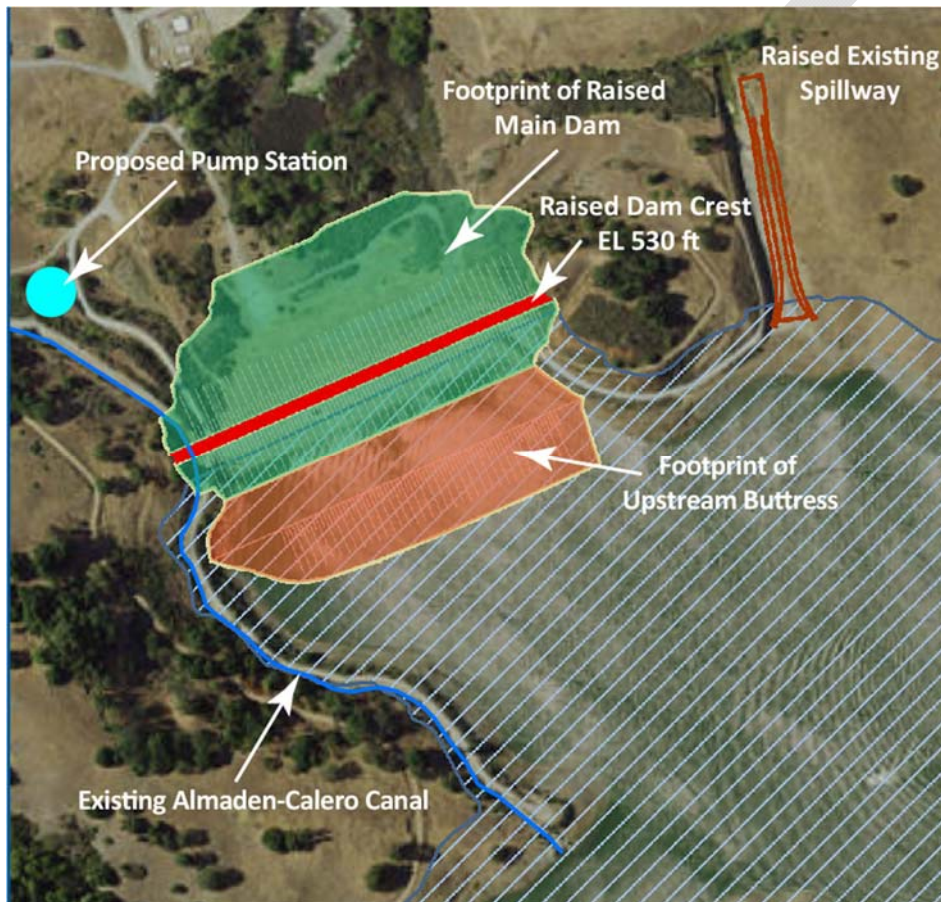


Figure A1-8: Almaden-Calero Canal and Proposed Pump Station

1.8 PUBLIC AND PRIVATE PROPERTY IMPACTS

As the water level of the reservoir is increased, public and private land surrounding the reservoir rim will be inundated. Acquisition of portions of parcels or entire parcels of public and private land surrounding the reservoir will be required for the proposed raise. The reservoir extent for a new WSEL of 516 ft is shown with parcel impacts in Figure A1-9. A total of 24 parcels will be impacted. Of these parcels eight are owned by County Parks, fifteen are owned by the District, and one is private property.

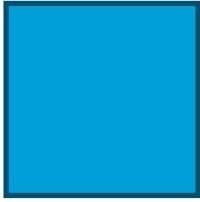


Figure A1-9: Calero Reservoir Expansion Proposed Increased WSEL and Impacted Parcels

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1.9 PUBLIC PROPERTY IMPACTS

McKean Road follows the northeastern rim of the reservoir and is a portion of county road G8 through the region. An approximately three-mile portion of McKean Road will be inundated by the 30 ft WSEL increase. The American Road & Transportation Builders Association (ARTBA) estimates that the cost to build a rural undivided two-lane road is between \$2 and \$3 million per mile. Due to labor costs in California, the remote nature of the site, and potential required earthwork, the McKean Road replacement cost is estimated as \$5 million per mile. The impacted section is shown in Figure A1-10. The orange contour line represents the 30-ft WSEL increase to EL 516 ft. The estimated cost for replacing this stretch of McKean Road is \$13.9 million. The proposed realignment is shown in Figure A1-11.

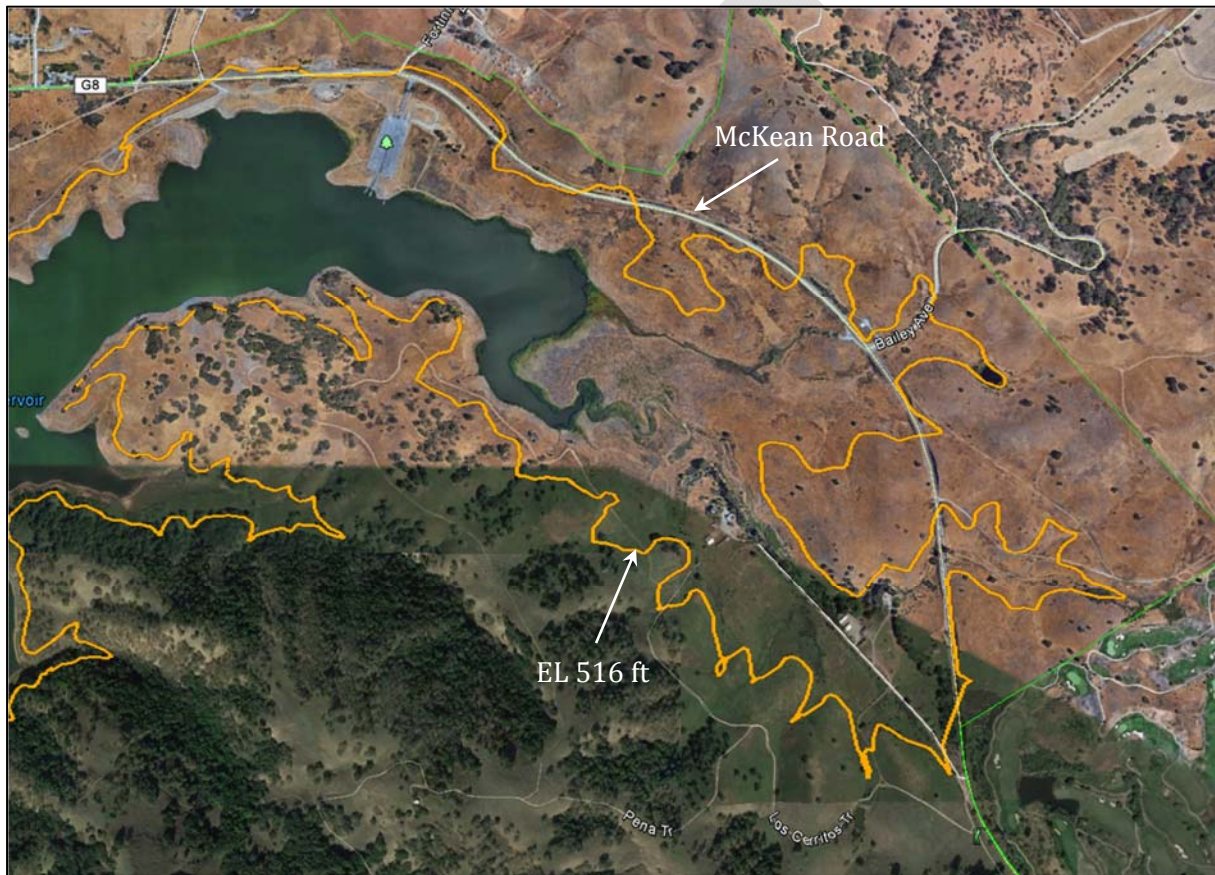


Figure A1-10: Extent of McKean Road Impact



Figure A1-11: McKean Road Realignment

To avoid impacting the Cinnabar Hill Golf Course with the road realignment, a new approximately 300 ft long bridge would need to be constructed as part of the McKean Road replacement due to the higher WSEL. The bridge would allow McKean Road to be re-routed along the southeast rim of the raised reservoir without crossing onto the Cinnabar Hill Golf Course. The location of the new bridge is shown in Figure A1-12. The Federal Highway Administration (FHWA) maintains a National Highway System Bridge Database containing replacement costs. According to the database, the representative cost per square foot of bridge deck is \$189 in 2015 dollars. Given the bridge 300-ft span length and assumed width of 30 ft, the estimated bridge construction cost is approximately \$1.7 million.

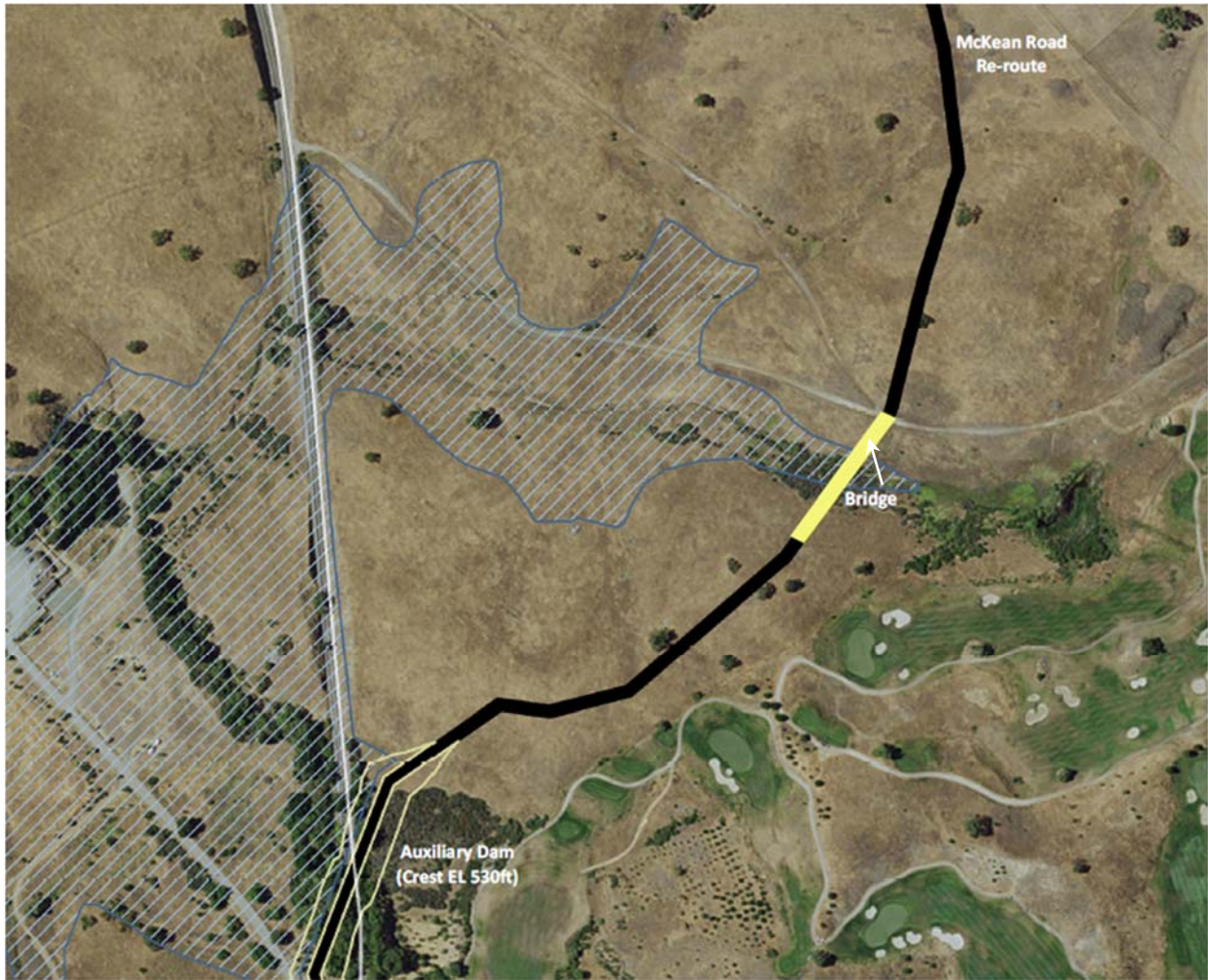


Figure A1-12: New McKean Road Bridge Location

1.10 PRIVATE PROPERTY ACQUISITION COSTS

As indicated above, only one of the 24 properties impacted by the raise is privately owned, and that is Parcel 28 along the southeast rim of the reservoir, as shown on Figure A1-13. No structures on the parcel would be inundated; however, the access road to the parcel will be impacted. The cost of acquisition was based on the average of recently sold rural undeveloped land near Calero Dam from Zillow.com. The average cost per acre is \$240,000. Assuming an impact of 0.32 acres to account for impacts from the Golf Course auxiliary dam and stream diversion, the estimated cost for property acquisition is approximately \$77,000. The cost for replacing approximately 225 ft of the single lane gravel access road is estimated to cost approximately \$22,000, based on estimates from Florida Department of Transportation's generic cost per mile models.

Currently, the County land surrounding the reservoir has not been encumbered by conservation easements; however, according to the Santa Clara Valley Habitat Plan FY 2013-2014 and FY 2014-2015 Annual Report (March 2016), the Calero Preserve is a potential acquisition that is being considered by the Habitat Agency (Section 3-4). If adjacent county lands are incorporated into the reserve system and placed into conservation easements, negotiations to impact this habitat for the expanded reservoir footprint will be more challenging.



Figure A1-13: Impacts to Parcel 28

1.11 IMPACTS TO PROTECTED SPECIES AND HABITATS

The rim of the reservoir includes habitat for special status species, including the Bay Checkerspot butterfly (*Euphydryas editha bayensis*; Federally Threatened) and the California tiger salamander (*Ambystoma californiense*; Federally and State Threatened), as shown in Figure A1-14.

The project footprint also includes impacts to serpentine soils and several rare plant species. Raising the WSEL would result in a permanent loss of grassland, oak woodland, chaparral, and wetland habitats surrounding the reservoir rim.

The Valley Habitat Plan (VHP) does not cover increasing storage capacity in reservoirs; therefore, permits would need to be negotiated outside of the VHP. The permitting process would include obtaining Section 7 incidental take permits from US Fish and Wildlife Service (USFWS) for federally listed species, in consultation with the Army Corp of Engineers. Additional permits such as Clean Water Act Section 404, Streambed Alteration Agreement, and Clean Water Act Section 401 will also be required. Impacts to species of special concern and rare plants species (that are not State or Federally-listed) will need to be addressed in the CEQA process and may require mitigation, but these species are not likely to be the leading cost-drivers so they are not discussed further in this evaluation.

For the purposes of this memorandum, the VHP fee schedule and the mapped VHP fee zones were used as a guide to evaluate the costs. The impacts to special habitats, shown in Figure A1-15, are estimates based on rough delineations of habitat types. Actual surveys to identify wetlands, rare plants, and serpentine soils are recommended to provide more accurate estimates. The mitigation cost estimates discussed below use the VHP fee schedule as a guide, but mitigation prices can vary depending on the mitigation strategy. Furthermore, this discussion is based on mitigating habitat lost at a 1:1 ratio, as is done in the VHP. This project is not covered under the VHP plan and regulatory agencies may require 3:1 or 2:1 mitigation ratios, which could drive the cost of mitigation up significantly.

1.12 CALIFORNIA TIGER SALAMANDER

Several known California tiger salamander breeding ponds and wetlands, shown in Figure A1-14 and Figure A1-15, surround the reservoir. Raising the WSEL and expanding dam structures would impact California tiger salamanders and wetlands. A Section 7 permit and a Section 404 Army Corp of Engineers permit would be needed to cover these activities. Creating new wetlands and buying mitigation credits are strategies that could be used to meet mitigation requirements. The VHP fees call for \$407,119 per acre of impacted wetland and the proposed expansion would impact approximately 15 acres of wetland habitat, equating to \$6.2 million in estimated costs for mitigation to wetlands. Additional funds would likely be required to mitigate for lost upland habitat for California tiger salamander, but the main cost driver is likely the loss of wetland and/or breeding habitat.

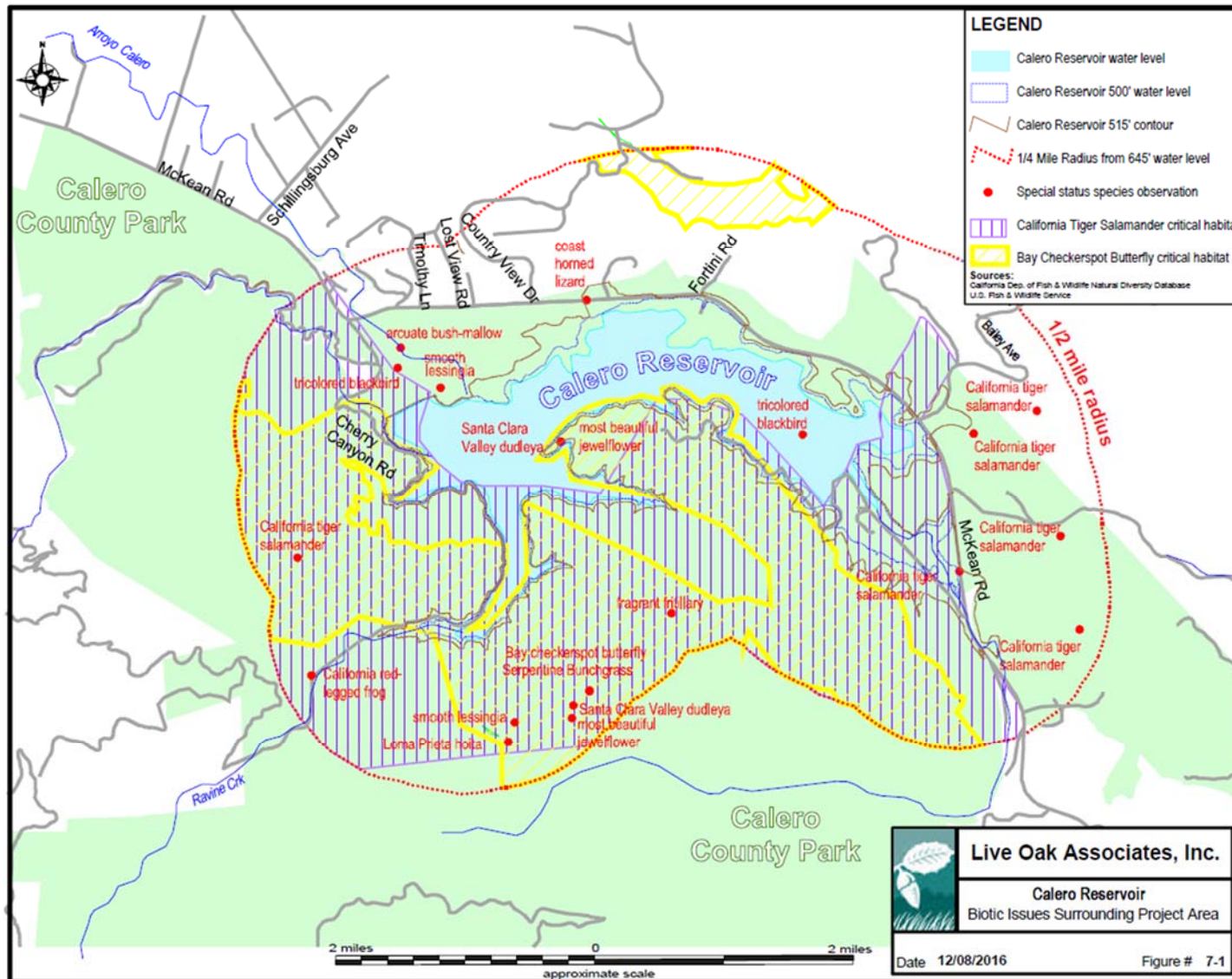


Figure A1-14: Calero Reservoir Biotic Issues

1.13 BAY CHECKERSPOT BUTTERFLY

There are known occurrences of Bay checkerspot butterfly on the ridge south of the reservoir, as shown in Figure A1-14. Raising the WSEL will not likely impact the ridge populations; however, impacts to serpentine soils north of the existing dam may be considered as an impact to this species. A Section 7 take permit will likely be needed to impact this habitat and mitigation for all serpentine soil habitat that is impacted will be required. The VHP fees call for \$64,346 per acre of impacted serpentine soils and it is estimated that approximately 1 acre of serpentine soils will be impacted, resulting in approximately \$70,000 in mitigation costs for this habitat type.

DRAFT



Figure A1-15: Calero Reservoir Expansion Habitat Impacts Analysis

DRAFT

1.14 OPINION OF PROBABLE PROJECT COST

Conceptual opinions of probable project cost (OPPC) were prepared for both alternatives, based on the necessary improvements and property acquisitions identified herein. A 50% contingency has been applied to capital improvements and a 25% contingency applied to real estate. Costs for environmental permitting, planning and design and general requirements have also been included in Table A1-2.

Table A1-2: Opinion of Probable Project Costs of Alternatives 1 and 2

| OPPC, 2016\$ MILLION | ALTERNATIVE 1 (\$M) | ALTERNATIVE 2 (\$M) |
|--|----------------------------|----------------------------|
| Earthfill Dam Raise | \$37.0 | \$37.0 |
| Auxiliary Spillway Raise | \$22.0 | \$22.0 |
| Golf Course Auxiliary Dam | \$7.3 | \$7.3 |
| Alternative 1 Auxiliary Dam | \$1.7 | -- |
| Alternative 2 Auxiliary Dam | -- | \$1.2 |
| Spillway Excavation & Concrete | \$4.0 | \$4.0 |
| McKean Road Relocation | \$13.9 | \$13.9 |
| Bridge | \$1.7 | \$1.7 |
| Stream Diversion Channel Cut | \$0.9 | \$0.9 |
| Stream Diversion Riprap | \$1.9 | \$1.9 |
| Environmental Impacts – Wetland & Serpentine | \$6.2 | \$6.2 |
| Almaden-Calero Canal Pump Station | \$5.0 | \$5.0 |
| Construction Costs | \$101.6 | \$101.1 |
| Contingency (50%) | \$50.8 | \$50.6 |
| Subtotal | \$152.4 | \$151.7 |
| General Requirements (12%) | \$18.3 | \$18.2 |
| Planning & Design Consultant (15%) | \$22.9 | \$22.8 |
| Capital Improvements Total | \$193.6 | \$192.6 |
| Property Acquisition | \$0.1 | \$0.1 |
| Real Estate Contingency (25%) | \$0.02 | \$0.02 |
| Real Estate Total | \$0.1 | \$0.1 |
| Grand Total OPPC | \$193.7 | \$192.7 |

From this OPPC, the cost of additional storage per acre-ft has been calculated and is presented in Table A1-3.

Table A1-3: Opinion of Probable Cost per Additional Acre-Foot Storage

| | ALTERNATIVE 1 | ALTERNATIVE 2 |
|---------------------------------------|--------------------------------|-------------------------------|
| | Raise Existing Spillway | Construct New Spillway |
| Grand Total OPPC | \$193.7 million | \$192.7 million |
| Additional Potential Storage (AF) | 14,000 | 14,000 |
| Cost Per AF Additional Storage | \$13,837 | \$13,767 |

As Table A1-3 shows, the cost differential between Alternatives 1 and 2 is negligible.. The primary cost drivers as shown in Table A1-2 are the earthwork required for both the main dam raise and the auxiliary dam raise, the two new auxiliary dams, and the McKean Road relocation.

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ATTACHMENT 1

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ATTACHMENT 2

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ATTACHMENT 3

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Calero Dam Expansion

Water Storage Exploratory Committee
November 7, 2018

Table 1: Preliminary Schedule for Calero Dam Retrofit and Expansion Options

| Calero Dam Options | | Certified CEQA Document | Completion of Design and Permitting | Estimated Start of Construction |
|--------------------|---|-------------------------|-------------------------------------|--|
| A | Seismic Retrofit Project Only (baseline) | 2020 | 2021 | 2021 |
| B | Seismic Retrofit Project and programmatic-level CEQA for future reservoir expansion. | 2024 | 2025 | Retrofit: 2026 Expansion: TBD |
| C | Expanded project-level CEQA for future reservoir expansion. Secure permits for both seismic retrofit and reservoir expansion. Phased construction: retrofit work first; expand reservoir in future. | 2026-2027 | 2029-2031 | Retrofit: 2031-2032 Expansion: TBD |
| D | Expanded project-level CEQA. Seismic retrofit and reservoir expansion constructed as one project. | 2026-2027 | 2029-2031 | Retrofit: 2031-2032 Expansion: Same |
| E | Undertake a separate and parallel effort for reservoir expansion. | 2026-2027 | 2029-2031 | Retrofit: 2021 Expansion: 2031-2032 |

Table 2: Schedule Impacts to Baseline

| Calero Dam Options | Schedule Impacts |
|-------------------------|---|
| A (Baseline Project) | <ul style="list-style-type: none"> • Anticipated schedule for the current seismic retrofit work on Calero. |
| B | <ul style="list-style-type: none"> • Additional 2 years for hiring of additional staff, development of RFP, hiring new consultant. • 2 more years for project development to perform a programmatic-level impact analysis. • Additional 1 year for permit negotiations. |
| C, D | <ul style="list-style-type: none"> • Additional 6-7 years of detailed project development [secure approval from DSOD; the hiring of additional staff; preparation of an RFP; and hiring consultants, detailed design]. • Additional 3 to 4 years for permit negotiations. |
| E | <ul style="list-style-type: none"> • Retrofit work begins as currently scheduled. • Separate Project: Additional 6-7 years of detailed project development [secure approval from DSOD; the hiring of additional staff; preparation of an RFP; and hiring consultants, detailed design]. • Additional 3 to 4 years for permit negotiations. |

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File No.: 18-0959

Agenda Date: 11/7/2018

Item No.: 5.4.

COMMITTEE AGENDA MEMORANDUM

Water Storage Exploratory Committee

SUBJECT:

Update on Proposed Sites Reservoir Project.

RECOMMENDATION:

- A. Receive and discuss information on the Sites Reservoir Project; and
- B. Provide feedback and direction regarding communication with the Board.

SUMMARY:

Santa Clara Valley Water District (District) staff is evaluating the District's continued involvement in the Sites Reservoir Project (Project), a proposed 1.8 million acre-feet 'off-stream' reservoir in the Coastal Range foothills near the Town of Maxwell in Colusa County. The proposed Project location is shown in Attachment 1. The Project consists of the diversion and storage of surplus water supplies from the Sacramento River north of the San Francisco Bay/Sacramento-San Joaquin River Delta (Bay Delta). Diversions into and out of the proposed reservoir will be facilitated using a newly constructed pipeline and via existing canal systems (i.e., the Tehama-Colusa and Glenn-Colusa Canals). Project facilities are also shown in Attachment 1. According to Sites Joint Powers Authority (Sites JPA), the total cost of the Project is anticipated to be \$5.5 billion (capital cost in 2015 dollars).

On July 26, 2016, the Board approved participation in Phase 1 of the Project, which committed the District to participation in the Sites Reservoir Project Committee (Reservoir Committee) and supporting the application for California Proposition 1 funding under the Water Storage Investment Program (WSIP). The District reserved a 4.8% share of the Project (District Share) at a Phase 1 cost not to exceed \$1.44 million. Phase 1 District costs at end of calendar year 2018 are expected to be approximately \$997,000. To continue participating in the Project, the District is being asked to commit additional funding to support Phase 2, which is scheduled to begin in April 2019.

Staff is evaluating the potential benefits and costs of the Project in the context of the District's Water Supply Master Plan, including the ability to utilize the yield of the Project if other water supply investments are realized. Staff expects to provide an update on the Water Supply Master Plan to the full Board on November 20, 2018 and, at that time, will seek Board guidance on how and when recommendations on Sites and other projects should be brought to the full Board for action.

Project Governance

The Sites JPA is comprised of Sacramento Valley water agency and landowner interests and was

formed on August 26, 2010 to pursue the development and construction of the Project. The Sites JPA delegated authority to the Reservoir Committee to manage the design and analysis of Sites Reservoir facilities and financing. The District, as well as other State Water Contractor participants and some Sites JPA participants, serve on the Reservoir Committee. The governance structure with a list of current participants is shown in Attachment 2. Staff anticipates that the governance structure may be evaluated and adjusted during Phase 2.

Potential District Benefits

Project water supply and operational benefits could be realized by diverting surplus water into Sites Reservoir during high river flow events for later release to participants, in conjunction with operation of Oroville and Shasta Reservoirs. District staff anticipates that the Project could provide the following benefits to the District:

- An increase in water supply, primarily in dry years;
- Storage rights in Sites reservoir proportional to the District Share; and
- Improvement in Shasta Reservoir storage levels and cold-water pool that may provide fishery benefits and help stabilize CVP deliveries.

The extent to which these benefits can be realized depends on several issues that have yet to be resolved, including permit requirements, potential participation by the US Bureau of Reclamation (Reclamation) and other agencies, and integration of operations with the SWP and CVP, as well as with other Sacramento Valley users and projects. In addition, there is uncertainty regarding the intention of other participants to continue supporting the project in Phase 2.

Staff has evaluated available modeling results provided by the Sites JPA in its WSIP application to assess the share of yield that could be delivered to the District. Given several uncertainties associated with implementation of the California WaterFix and permit requirements, staff has conservatively assigned losses of 25% on the modeled deliveries. This results in a yield of roughly 23,000 acre-feet per year of yield in 'dry' and 'critical' years available to the District based on current District Share, and around 12,000 acre-feet per year on average. However, the portion of yield that is *usable* by the District is likely to be significantly lower than these numbers, depending on the portfolio of water supply projects that the District ultimately implements. Additional modeling refinements are currently being implemented to better estimate potential yields and benefits.

Project Costs

The Sites JPA currently anticipates total Project costs to be around \$5.5 billion (capital cost in 2015 dollars), with Phase 2 costs to be around \$375 million. Nominal costs are estimated at approximately \$6.5 Billion. Phase 2 costs vary slightly with approach outlined above, as differences are based largely on when costs are paid by participants (i.e., mostly up-front 2019 and 2020 or increase occurring in later years).

The state CWC approved \$816 million in WSIP-eligible funding¹, currently representing around 13 percent of Project costs. Additionally, the Project could be eligible for up to 25 percent of Project costs covered by the Reclamation and federal Water Infrastructure Improvements for the Nation (WIIN) Act funding. Reclamation and WIIN Act contributions will be based on recommendations of a

Draft Federal Feasibility Report investigating Project viability, and exact financial contributions have not yet been defined. Both state and federal funding will pay for 'Public Benefits' shares of the Project which would be used for environmental and recreational purposes and which would be separate from water supply benefits provided to water user participants. The Sites JPA anticipates \$40.8 million and roughly \$75 million in WSIP and WIIN 'early funding' could be used towards Phase 2 costs, respectively.

Calendar Year 2019 Funding Request for Phase 2

During Phase 2, key issues will be addressed, including 1) allocation of storage rights as well as water supply yield to remaining participants, 2) securing water rights from the State Water Resources Control Board, 3) integration of the Project with the SWP and CVP, and 4) Project governance. Phase 2 efforts will likely include additional planning, preliminary engineering and design, environmental review, and permitting; however, the specific tasks and schedule have not yet been determined. It is anticipated the entirety of Phase 2 will span calendar years 2019 through 2023.

The Sites JPA initially requested participants make a total funding commitment of \$350 million to fund Phase 2 costs, which would have resulted in costs to the District of roughly \$35 million or more. District representatives, along with other participating SWP contractors, advocated for a reduced Phase 2 funding obligation.

In response, on October 18, 2018, the Sites Reservoir Committee presented a financing plan which limits Phase 2 costs by annual funding commitments. Three alternative funding plans (Plan A, Plan B, and Plan C) were presented, with significantly reduced funding levels in calendar year 2019 provided in Plans B and C.

The proposed funding plans and estimated costs are described below and in Table A. For Phase 2, participating water users are being asked to commit funding at levels in proportion to their shares in the Project. Based on staff's current estimate of participation levels by water users, the District's share of calendar year 2019 costs for Phase 2 is roughly 10%; this estimate may change based on the decisions made by other water users.

Participants have been asked to choose among the three funding approaches described below. During the October 18, 2018 Reservoir Committee meeting, most participants have indicated a preference for Plan C.

- *Plan A Baseline (Funding Request for 2019 = \$34.4 million; estimated District share = \$3.4 million):* Plan A is the original funding request that addresses tasks and activities with greatest certainty of meeting statutory milestones as conditions to WSIP and other potential funding sources. This includes coordination with agencies and significant early funding to advance Project engineering (e.g., geotechnical planning, facilities optimization, and environmental analyses).
- *Plan B Operational Certainty (Funding Request for 2019 = \$9.7 million; estimated District share = \$1 million):* Plan B reduces the scope of work to focus on defining Project operations (e.g., financial and operational integration with existing facilities) in calendar year 2019. This would allow participants to commit only enough funding to resolve key

issues to clarify project operations and benefits before deciding whether to commit further resources to the Project. The reduced funding commitment in 2019 would result in increased spending in subsequent years if the Project continues, as well as increasing risks of not meeting statutory milestones. Total Phase 2 costs over 2019 through 2023 are expected to be about \$5 million higher than baseline.

- Plan C Operational Certainty with Additional Early Funding (Funding Request for 2019 = \$15 million; estimated District share = \$1.5 million):* Similar to Plan B, Plan C reduces the scope of work in calendar year 2019 to focus on defining Project operations, but also includes an additional \$5 million in funding for key efforts during calendar year 2019 such as finalizing the EIR/EIS, coordination with the Division of Safety of Dams, and analysis of power issues. This would increase the likelihood that State and federal funding requirements will be satisfied. Costs in subsequent years would be higher, but total Phase 2 costs between 2019 and 2023 are projected to be about \$10 million lower than baseline.

Potential financing and participation terms for Phase 2 are being developed; however, if the District chooses to provide funding for calendar year 2019 consistent with Plan B or Plan C, staff anticipates funding the Districts share using existing funds in the Imported Water Unit FY 2019 budget, without needing to become a debt partner with Sites JPA.

Table A. Estimated Funding Request for 2019 (\$ Millions)

| Plan | Participant Share | WSIP (Prop 1) Early Funding | Possible WIIN Federal Early Funding | Total Request | District Share |
|------|-------------------|-----------------------------|-------------------------------------|---------------|----------------|
| A | 34.4 | 33.9 | 17.1 | 85.4 | 3.4 |
| B | 9.7 | 8.8 | 4.6 | 23.2 | 1.0 |
| C | 15.0 | 17.2 | 8.0 | 40.2 | 1.5 |

The Sites JPA requests that project participants decide on their funding levels for calendar year 2019 by March 2019. Funding commitments for subsequent work efforts during Phase 2 will be requested at the end of calendar year 2019 and likely on an annual basis.

Next Steps

The Sites JPA requests that the District make a funding commitment to support Phase 2 work efforts to be performed during calendar year 2019. Phase 2 is anticipated to begin in April 2019; consequently, the District is requested to make a commitment by March 2019. District staff is currently working with Reservoir Committee partners to develop a Phase 2 participation agreement outlining the approaches presented here with associated costs. Modeling and analysis efforts are also under way to assess appropriate adjustments, if any, to the District Share going forward. Once additional critical information becomes available, District staff will update the Board’s Committee.

ATTACHMENTS:

File No.: 18-0959

Agenda Date: 11/7/2018
Item No.: 5.4.

Attachment 1: Sites Reservoir Project Map

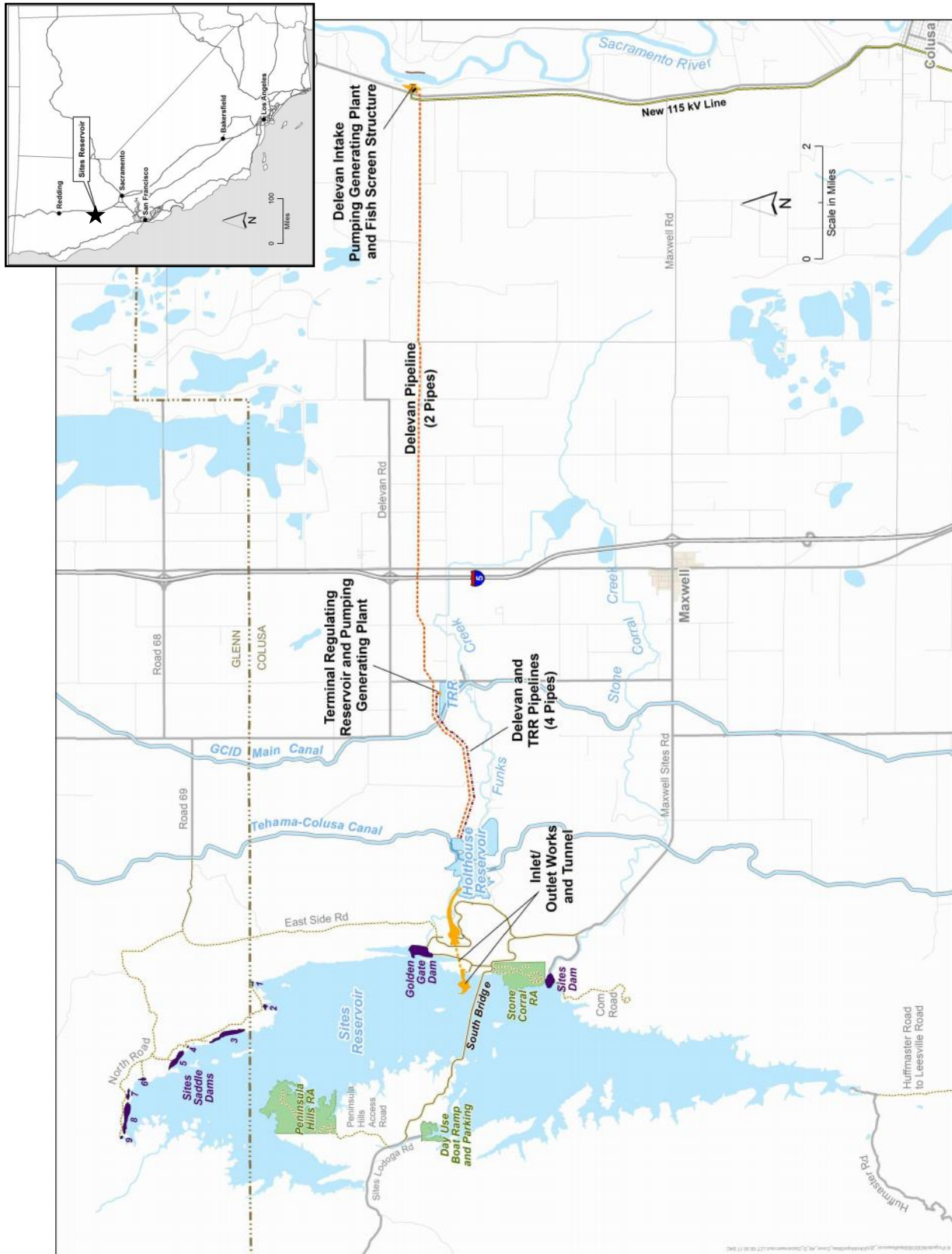
Attachment 2: Sites Authority and Reservoir Committee Structure

Attachment 3: Staff PowerPoint

UNCLASSIFIED MANAGER:

Garth Hall, 408-630-2750

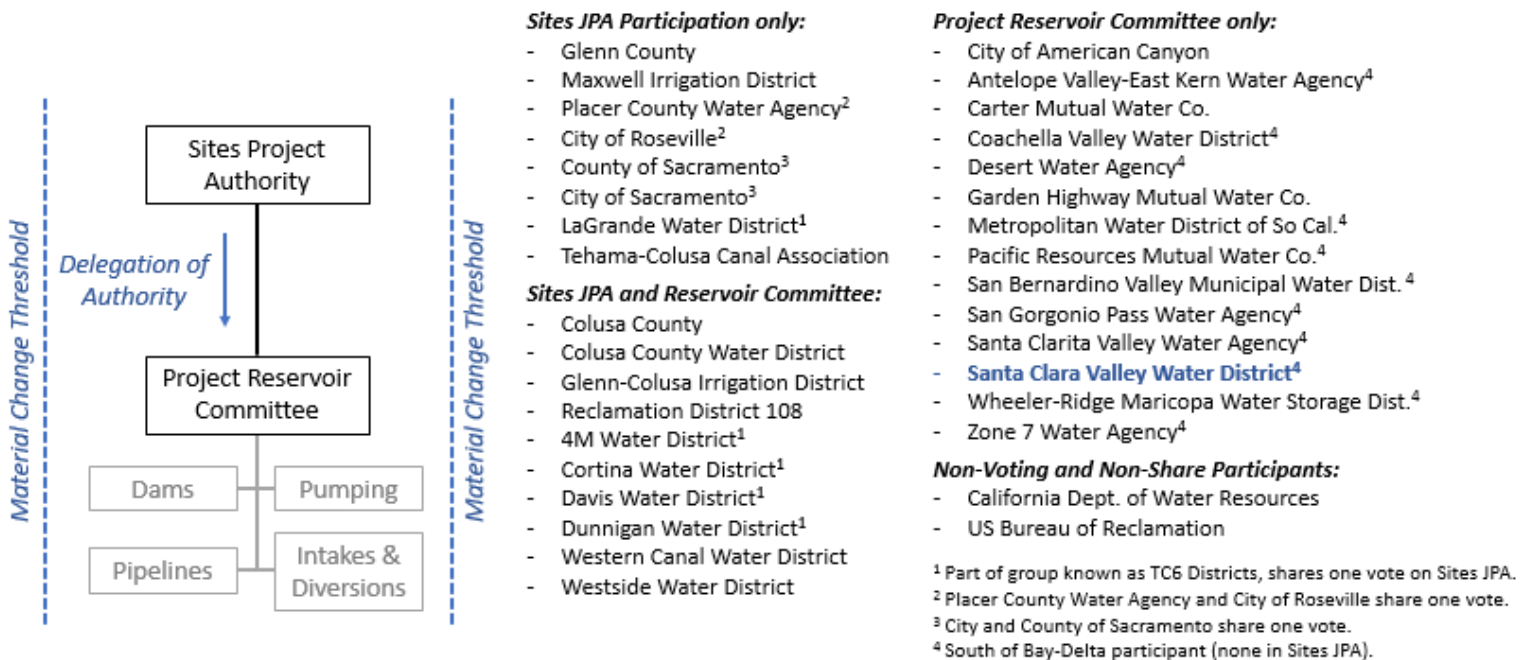
Sites Reservoir Project Map



From public Proposition 1 WSIP Application ('A4_Drawings' sub-section) document.

Sites Authority and Reservoir Committee Structure

Below is a general diagram showing the roles of the Sites Project Authority (Sites JPA) and the Project Reservoir Committee (Reservoir Committee), adapted from Sites Project documentation.



Sites JPA roles and responsibilities:

- Applicant for Proposition 1 Water Storage Investment Program (WSIP) application.
- CEQA lead agency, and work with USBR as NEPA lead agency.
- Hold title to any water rights issued by State Water Resources Control Board (SWRCB).
- Obtain permits and acquire property, easements and rights-of-way.
- Be owner of record for dam safety requirements and regulatory obligations.
- Work with DWR and USBR for Project operations and coordination with SWP and CVP.
- May delegate (or rescind) responsibilities of Project Reservoir Committee.

Reservoir Committee roles and responsibilities:

- Comply with terms and conditions established by Sites JPA in Reservoir Project Agreement.
- Maintain sufficient reserves to ensure positive cash flow.
- For Phase 1, manage the studies and related materials that will be required in the WSIP application.
- For Phase 2, studies and materials required for additional planning, preliminary engineering and design, and environmental review.

Decision Making:

Each decision-making body has discretion to make decisions within limits of their authorities. Limits are defined as thresholds that may result in a Material Change from baseline conditions approved by Sites JPA.

- *Sites JPA:* Chartering documents and bylaws.
- *Reservoir Committee:* Bylaws and compliance with terms and conditions delegated by Sites JPA in the Reservoir Project Agreement.

Material Change provisions:

- Budgets: operating and target, including line-item transfers or adjustments.
- Eligibility to receive funds from WSIP.
- Impact to water rights and/or annualized yield.
- Changes in Participants' levels of funding commitment that may shift additional costs to other participants.
- Dam safety permits and compliance.
- Changes in scope, schedule, or cost – both up-front and O&M.
- Change in pumping power (or renewable generation).
- Comply or require extreme measures to comply with OSHA requirements.
- Shifting or significant risk.
- Changes in environmental mitigation or compliance obligations.
- Changes in facility performance or reliability.

Sites Reservoir Project: Phase 2 Financing Options

(per 10/18/2018 Reservoir Committee Meeting, Agenda Item 3-3)

Plan A

Baseline

(Lowest Risk)

- Early start on defining project operations, preliminary design, and environmental review.
- Requires significant amount of early funding from participants.
- Greatest certainty to meet statutory milestones.

Plan B

Operational Certainty

(Highest Risk)

- Focus on defining project operations in 2019.
- Delay in other early start tasks.
- Significantly reduced funding in 2019, increases in subsequent years.
- Increases risk of missing statutory milestones.

Plan C

Operational Certainty with Additional Tasks

(Moderate Risk)

- Focus on defining project operations in 2019.
- Includes some preliminary design and environmental review.
- Significant funding reduction in 2019 but higher than B.
- Reduced risk relative to B in meeting statutory milestones.

Estimated Cost Comparison for Phase 2

(per 10/18/2018 Reservoir Committee Meeting, Agenda Item 3-3)

| \$ in Millions | 2019 | 2020 | 2021 | 2022 | Total | Relative Risk |
|----------------|------|-------|-------|------|-------|---------------|
| Plan A | 85.4 | 98.6 | 110.3 | 83.6 | 377.8 | Lowest |
| Participants | 34.4 | 72.0 | 88.2 | 66.9 | 261.5 | |
| WIIN | 17.1 | 19.7 | 22.0 | 16.7 | 75.6 | |
| WSIP | 33.9 | 6.9 | | | 40.8 | |
| Plan B | 23.2 | 98.0 | 217.7 | 43.9 | 382.7 | Highest |
| Participants | 9.7 | 46.4 | 174.1 | 35.1 | 265.4 | |
| WIIN | 4.6 | 19.6 | 43.5 | 8.8 | 76.5 | |
| WSIP | 8.8 | 32.0 | | | 40.8 | |
| Plan C | 40.2 | 103.7 | 180.7 | 43.5 | 368.1 | Moderate |
| Participants | 15.0 | 59.3 | 144.6 | 34.8 | 253.7 | |
| WIIN | 8.0 | 20.7 | 36.1 | 8.7 | 73.6 | |
| WSIP | 17.2 | 23.6 | | | 40.8 | |

ES2

How do you define risk? Plan A could consider being the highest risk given the uncertainty of the project and the higher costs.
Erick Soderlund, 10/29/2018

Estimated Funding Request for 2019

(per 10/18/2018 Reservoir Committee Meeting, Agenda Item 3-3)

| \$ in Millions | Participant Share | WSIP Early Funding | Possible WIIN Early Funding | Total Request | District Share |
|----------------|-------------------|--------------------|-----------------------------|---------------|----------------|
| Plan A | 34.4 | 33.9 | 17.1 | 85.4 | 3.4 |
| Plan B | 9.7 | 8.8 | 4.6 | 23.2 | 1.0 |
| Plan C | 15.0 | 17.2 | 8.0 | 40.2 | 1.5 |

File No.: 18-0977

Agenda Date: 11/7/2018

Item No.: 5.5.

COMMITTEE AGENDA MEMORANDUM

Water Storage Exploratory Committee

SUBJECT:

Update on Los Vaqueros Reservoir Expansion Project (LVE Project).

RECOMMENDATION:

Receive and discuss information on Los Vaqueros Reservoir Expansion Project (LVE Project).

SUMMARY:

Santa Clara Valley Water District (District) staff has continued to review the LVE Project, which is an off-stream reservoir located in Contra Costa County and operated by Contra Costa Water District (CCWD). Originally constructed in 1998 with a capacity of 100,000 AF, it was expanded to 160,000 AF in 2012. The proposed LVE Project would expand the reservoir to 275,000 AF and add a new pipeline connecting CCWD's system to the California Aqueduct. Water could be moved from CCWD's intakes in the Delta, with or without storage in Los Vaqueros Reservoir, to the District's system, without relying on the South-of-Delta pumps.

Total construction cost of the expansion is estimated to be approximately \$980 million (in 2015 dollars). CCWD received the maximum eligibility award of \$459 million from the California Water Commission (CWC) as part of WSIP funding. CWC authorized \$13.65 million in early funding for planning and design. CCWD has also requested \$10 million in federal funding for planning and design through the FY19 Water Infrastructure for Improvements to the Nation (WIIN) Act. CCWD will need more money from partners to continue with environmental, federal feasibility, financial evaluation, governance, permitting and design efforts and to be used as matching local funds required for WSIP and WIIN. The total near term cost to local partners is estimated at \$3 million as part of a Multi-Party Cost-Share Agreement. Costs will be divided evenly between the local partners which would require the District to contribute between \$200,000 to \$260,000, depending on whether any local partners drop out of the Project, in addition to our prior payment of \$100,000 to support CCWD's Proposition 1 application and would carry the LVE Project through the end of 2019 and the formation of a Joint Powers Authority (JPA).

CCWD hosted a webinar on September 25, 2018 to discuss CalSim modeling done for the Project, which serves as a basis for the financial model. A separate webinar was held on October 11, 2018 to discuss the first version of the financial model. The financial model divides costs by the relative usage of each of the new and expanded facilities and adds a cost for use of existing CCWD facilities. The model allows local partners to consider how much benefit is received given the costs. Under current modeling, the District provides excess supplies to the Project, which can be distributed to

other partners, primarily San Francisco and the Refuges. The first version of the financial model does not account for these transfers or exchanges and thus the District's costs are shown to be much greater than the benefits. Staff held a meeting with CCWD and the financial consultant about equitably allocating these costs, and this will be incorporated into the next version of the financial model due out in December.

Staff will continue working with CCWD on the District's participation level in the Project, including how much, if any, dedicated storage to reserve in the reservoir and use of the Transfer Bethany Pipeline in order to balance District needs with potential cost.

Staff has also had preliminary discussions with the other South Bay Contractors about non-participants use of the South Bay Aqueduct which could result from the Project. Staff is preparing a set of guiding principles to be considered by management.

Project Governance

CCWD's financial consultant will work with the LVE Project partners to develop a JPA agreement, anticipated to be established in 2019. The partners are still discussing whether to hire independent counsel to represent them individually during JPA negotiations. Once the JPA is in place, design and construction responsibilities will transition from CCWD to the JPA.

Schedule for Partnership Negotiations

Key near-term meetings and decision points on the LVE Project include the following:

- November 27, 2018 - LVE Project briefing for partner agencies' General Managers
- Fall 2018 - Execute Multi-party Cost-Share Agreement
- Fall 2018 - CCWD to execute early funding agreement with CWC
- December 2018 - Version 2 of Financial Model available
- Winter 2018/2019 - Partners & CCWD negotiate key terms of cost and governance
- Spring 2019 - Decision to form JPA
- Summer 2019 - Finalize JPA

ATTACHMENTS:

None

UNCLASSIFIED MANAGER:

Garth Hall, 408-630-2750

File No.: 18-0955

Agenda Date: 11/7/2018

Item No.: 5.6.

COMMITTEE AGENDA MEMORANDUM

Water Storage Exploratory Committee

SUBJECT:

Investigation of Out-of-County Groundwater Storage and Banking Opportunities.

RECOMMENDATION:

Receive and discuss information on staff investigation of groundwater storage and banking opportunities.

SUMMARY:

Staff has been exploring options for participating in alternative groundwater storage projects to complement or provide alternatives to the District's investment in the Semitropic Groundwater Storage Program (Semitropic). The District has benefited from its investment in Semitropic for more than twenty years; for example, Semitropic provided the bulk of the District's supplemental supplies during the critically dry years of 2014 and 2015, indicating that groundwater banking can be effective during challenging conditions. Staff is currently evaluating several groundwater storage/banking opportunities in locations within the Central Valley that have existing or potential access to State Water Project (SWP) and Central Valley Project (CVP) facilities.

Currently, the District has approximately 280,000 acre feet of storage in Semitropic and the District's contractual maximum is 350,000 acre-feet. Semitropic is located far south of the District's service area; the California Aqueduct (Aqueduct) is an essential conveyance facility that makes Semitropic work for the District. A benefit of the Semitropic program has been the investment approach, which relies on annual operational costs without a large upfront capital investment.

While Semitropic has been an effective program for the District, it has its limitations. One aspect of Semitropic that can be challenging is the uncertainty of accessing the District's stored water during critically dry years when there are low southbound flows in the Aqueduct to enable exchanges. (In fact, the District has always received its requested Semitropic supplies but there was an instance in 2015 when our ability to do so was in question until late in the year.) In addition, there are limitations on the types and magnitude of wet year water that can be stored in the bank. Staff is also tracking reports on the declining groundwater levels in the area for which Semitropic is the SGMA Groundwater Sustainability Agency.

Staff is exploring the ability to develop other partnerships that could provide storage of a variety of wet year water supplies, could provide water quality benefits, and, ideally, would not involve significant capital investment. Other criteria considered include legal and environmental

considerations, water rights, county ordinances, CVP and SWP contractual rights and obligations, specific political issues, synergy with other potential projects of interest to the District, and the effects of implementing SGMA.

Four opportunities are being evaluated: two of these would involve conveyance and exchange arrangements through the Aqueduct similar to that of Semitropic but may provide additional operational flexibility and a broader suite of water sources to manage; two other opportunities offer significant diversity in that they would involve conveyance approaches with little or no use of the Aqueduct.

As staff's evaluation advances and specific proposals can be recommended, they will be brought to the Committee for consideration.

ATTACHMENTS:

None.

UNCLASSIFIED MANAGER:

Garth Hall, 408-630-2750

File No.: 18-0956

Agenda Date: 11/7/2018

Item No.: 5.7.

COMMITTEE AGENDA MEMORANDUM

Water Storage Exploratory Committee

SUBJECT:

Update on San Luis Reservoir Expansion.

RECOMMENDATION:

Receive and discuss information on San Luis Reservoir expansion.

SUMMARY:

This memo provides information regarding studies to expand San Luis Reservoir, including potential benefits to the District and the nexus with the Pacheco Reservoir Expansion Project. Expansion of San Luis Reservoir is being considered in two separate planning processes. The first is the Sisk Dam Safety of Dams Modification Project, which aims to mitigate seismic risk at Sisk Dam. The second is the San Luis Low Point Improvement Project, the purpose of which is to reduce the impacts to the District's water quality and delivery schedule from issues in San Luis Reservoir. Both are described in further detail below.

U.S. Bureau of Reclamation's (Reclamation) B. F. Sisk Safety of Dams Modification Project

B.F. Sisk Dam, which impounds San Luis Reservoir, was built between 1963 and 1967 to provide water storage and supplemental supplies to the Central Valley Project (CVP) and State Water Project (SWP). The existing capacity of the reservoir is shared between the SWP and CVP such that 55 percent is available to the SWP and 45 percent is available to the CVP. The dam is a 382-foot high compacted earth embankment over 3.5 miles in length providing a storage capacity of over two million acre-feet. The dam and reservoir are located in an area with potential for severe earthquake forces from active faults in the region.

Reclamation performed a series of investigations of the seismic safety of Sisk Dam, including a risk analysis of potential dam failure, and determined that a large earthquake in the immediate vicinity could result in liquefaction of the underlying geologic formations and deformation of the dam. The results indicated that failure of the dam is extremely unlikely in any given year, but that the consequences of failure would be severe. Reclamation determined that the level of risk is high enough that its Public Protection Guidelines for safety of dams are not being met and a corrective action is justified.

In 2006 Reclamation initiated the Corrective Action Study (CAS), which is the first phase of the B. F. Sisk Safety of Dams Modifications Project, to address these seismic concerns and develop a plan for mitigating the seismic risk. Reclamation's CAS and remediation plans are jointly funded and closely

coordinated with the Department of Water Resources. The CAS consists of additional studies of the dam's foundation and its resistance to deformation, the identification of alternative designs for modifications to the embankment including an updated risk analysis for each alternative, and the selection of the Proposed Action. The CAS was completed in April of 2018 and the project is now in the final design phase, with a construction contract award anticipated in late in 2020.

The Proposed Action includes only those elements necessary to meet Safety of Dams requirements, including a 12-foot raise of the dam crest and improvements to the embankments. The Proposed Action does not include any increase in storage capacity for water supply purposes. The preliminary feasibility level cost estimate for this alternative is between \$830 million and \$1.3 billion.

Expansion of San Luis Reservoir capacity was not initially considered in the seismic project, and the CAS does not include an analysis of the potential water supply benefits of raising the dam above the height required to mitigate the seismic risks. However, on August 31, 2018 the San Luis and Delta-Mendota Water Authority (SLDMWA) sent a letter to Reclamation's Mid-Pacific Regional Director requesting that Reclamation investigate the feasibility of raising Sisk Dam for additional water storage as part of the seismic project. Reclamation has not yet issued a formal response.

Information discussed at the September 13, 2018 SLDMWA Board meeting indicated that raising B. F. Sisk Dam by 10 feet above the level required to address seismic concerns would result in increased storage capacity of 120 thousand acre-feet (TAF) at an additional cost of between \$400 million and \$600 million. It has not been determined how the additional yield or storage capacity might be shared among beneficiaries. Reclamation is currently seeking funding to conduct further technical, environmental, and economic studies and it is not clear whether appropriations have been made for the upcoming fiscal year.

San Luis Low Point Improvement Project (SLLPIP)

San Luis Reservoir and the CVP San Felipe Division facilities constitute the primary delivery route for the District's CVP supplies. During the summer and fall, the low-point problem occurs when San Luis water levels decline to the point that algae blooms in the surface waters can be drawn into the San Felipe Division's intakes (at about 300 TAF storage level). In these circumstances, the District has difficulty treating San Luis water with its existing treatment facilities, and the algae can result in taste and odor and filter clogging issues. In extreme drawdown conditions, delivery of water to the District and San Benito County Water District through the San Felipe Division intakes can be interrupted or reduced since these intakes are at a higher elevation than the intakes for the other SWP and CVP contractors.

The SLLPIP was identified as a "conveyance" project among other projects in the 2004 CALFED Bay-Delta Authorization Act. For many years, the District has been working with Reclamation to explore various options as part of a comprehensive plan to address the low point issue. These options are being analyzed as part of a forthcoming Draft Environmental Impact Statement /Environmental Impact Report (Draft EIR/EIS), which is being prepared by Reclamation. The Public Draft EIS/EIR is expected to be released January 25, 2019.

Staff anticipates that the Draft EIR/EIS will include an alternative that raises Sisk Dam by approximately 10 feet resulting in an additional storage capacity of about 120 TAF. The Draft EIR/EIS will include modeling results from CalSim II, which is a planning simulation model that can be used to analyze the CVP/SWP operations under varying conditions. Increasing San Luis capacity may help address the low point problem if SWP and CVP project operators follow a practice of retaining sufficient storage to avoid disruption of CVP water deliveries to the District and San Benito County Water District. It is uncertain whether any project to enlarge San Luis would be accompanied by an operating policy to halt storage drawdown below 300 TAF. However, it is very clear that increased San Luis Reservoir capacity *would* result in increased storage for South of Delta contractors, which could result in increased allocations to those contractors, including the District.

Nexus with the Pacheco Reservoir Expansion Project

Another alternative being analyzed by Reclamation in the Draft EIR/EIS for the SLLPIP is the Pacheco Reservoir Expansion Project. District staff anticipates that this option will have the highest benefit-to-cost ratio of all the alternatives being evaluated. If the Pacheco Reservoir Expansion Project becomes the NEPA Proposed Action, the opportunity for federal participation in and funding for the Pacheco Project would increase.

District staff has not undertaken or received modeling analysis of the *combination* of the two alternatives described above: raising B. F. Sisk Dam and the Pacheco Reservoir Expansion Project. Most of the increased yield derived from a B. F. Sisk Dam raise and most of the storage captured in the Pacheco Reservoir Expansion Project would be realized in wet years.

ATTACHMENTS:

None

UNCLASSIFIED MANAGER:

Garth Hall, 408-630-2750

File No.: 18-0953

Agenda Date: 11/7/2018
Item No.: 5.8.

COMMITTEE AGENDA MEMORANDUM

Water Storage Exploratory Committee

SUBJECT:

Pacheco Reservoir Expansion Project Update

RECOMMENDATION:

This is an information only item and no action is required.

SUMMARY:

Background and Funding

On August 14, 2017, the District submitted an application to the California Water Commission (CWC) for California Proposition 1 Water Storage Investment Program (WSIP) funding for the Pacheco Reservoir Expansion Project (Project). The District's application requested funding for public benefits amounting to \$484.55 million, fifty percent of the estimated cost to implement the Project.

The CWC conditionally approved the District's full funding request of \$484.55 million on July 24, 2018, which included an Early Funding award of \$24.2 million. The Early Funding award was authorized by the CWC to reimburse the District for its expenditures since August 14, 2017, for efforts related to the completion of the Project's environmental documentation and permitting.

Staff has completed negotiations with the CWC regarding the requirements of the Early Funding Agreement (Agreement) that must be executed to receive the Early Funding award. It is anticipated that the final Agreement will be presented to the Board for review, approval, and execution in December 2018.

The District is also exploring additional project funding and low cost financing through the Federal Water Infrastructure Improvements for the Nation (WIIN) Act, the Water Infrastructure Finance and Innovation Action (WIFIA), and other and Federal and State funding and financing programs.

Should the Project qualify for funding through the WIIN Act, the potential exists to fund up to 25 percent of the total project costs that are not covered by state investment through WSIP. The District has completed the first step in the process to apply for WIIN Act funding, being designated a "State-Led-Storage Project" by the Governor of California.

Consultant Procurement

Staff plans to present two Consultant Services Agreements to the Board for approval on November

20, 2018. The first agreement is for program management services and the second encompasses planning, design, environmental, and permitting support consultant services (PDEC).

Public Outreach

Upon establishing long-term site access, tours for key stakeholder groups will be scheduled as weather and conditions permit. A video production agency has been contracted to produce an online interactive tour including future visual renderings. To expedite the production timeframe, the framework and other components of the online tour will be developed, to the extent possible, without onsite visuals or footage. After access is authorized, onsite high resolution photos and videos will be captured and added to complete the online tour.

Currently, interested community members are directed to the Pacheco Reservoir Expansion website and encouraged to sign up for proactive project communications updates. The website highlights project details and key benefits via videos, related documentation, and customized animation elements.

ATTACHMENTS:

None

UNCLASSIFIED MANAGER:

Christopher Hakes, 408-630-3796

File No.: 18-0957

Agenda Date: 11/7/2018

Item No.: 5.9.

COMMITTEE AGENDA MEMORANDUM

Water Storage Exploratory Committee

SUBJECT:

Review Water Storage Exploratory Committee Work Plan and the Committee's Next Meeting Agenda.

RECOMMENDATION:

Review the Committee's Work Plan to guide the Committee's discussions regarding policy alternatives and implications for Board deliberation.

SUMMARY:

The Committee's Work Plan outlines the Board-approved topics for discussion to be able to prepare policy alternatives and implications for Board deliberation. The work plan is agendaized at each meeting as accomplishments are updated and to review additional work plan assignments by the Board.

BACKGROUND:

Governance Process Policy-8:

The District Act provides for the creation of advisory boards, committees, or committees by resolution to serve at the pleasure of the Board.

Accordingly, the Board has established Advisory Committees, which bring respective expertise and community interest, to advise the Board, when requested, in a capacity as defined: prepare Board policy alternatives and provide comment on activities in the implementation of the District's mission for Board consideration. In keeping with the Board's broader focus, Advisory Committees will not direct the implementation of District programs and projects, other than to receive information and provide comment.

Further, in accordance with Governance Process Policy-3, when requested by the Board, the Advisory Committees may help the Board produce the link between the District and the public through information sharing to the communities they represent.

ATTACHMENTS:

File No.: 18-0957

Agenda Date: 11/7/2018
Item No.: 5.9.

Attachment 1: Water Storage Exploratory Committee 2018 Work Plan

UNCLASSIFIED MANAGER:
Michele King, 408-630-2711

2018 Work Plan: Water Storage Exploratory Committee

Update: October 2018

The annual work plan establishes a framework for committee discussion and action during the annual meeting schedule. The committee work plan is a dynamic document, subject to change as external and internal issues impacting the District occur and are recommended for committee discussion. Subsequently, an annual committee accomplishments report is developed based on the work plan and presented to the District Board of Directors.

| ITEM | WORK PLAN ITEM | MEETING | INTENDED OUTCOME(S) | ACCOMPLISHMENT DATE AND OUTCOME |
|------|--|---------|--|--|
| 1 | Review of the Water Supply Benefits and Costs of the Anderson Reservoir Seismic Retrofit Project | May 17 | <ul style="list-style-type: none"> Review of the Water Supply benefits and costs of the Anderson Reservoir Seismic Retrofit Project. | <p>Accomplished May 17, 2018: The Committee reviewed the Water Supply benefits and costs of the Anderson Reservoir Seismic Retrofit Project and took no action.</p> |
| 2 | <p>Update on the Proposed Pacheco Reservoir Expansion Project</p> <p>a. Update on the California Water Commission Review Process</p> <p>b. Update on Communication with Agencies, Stakeholders and Interested Parties</p> <p>c. Consideration of Proposed Term Sheet with the District, San Benito County Water District and the Pacheco Pass Water District</p> <p>d. Update on Procurement for Engineering Design and Environmental Documentation, as well as Project Management</p> | May 17 | <ul style="list-style-type: none"> Receive an update on the Proposed Pacheco Reservoir Expansion Project a. Update on the California Water Commission Review Process, b. Update on Communication with Agencies, Stakeholders and Interested Parties, c. Consideration of Proposed Term Sheet with the District, San Benito County Water District and the Pacheco Pass Water District, d. Update on Procurement for Engineering Design and Environmental Documentation, as well as Project Management. | <p>Accomplished May 17, 2018: The Committee received an update on the Proposed Pacheco Reservoir Expansion Project; a. Update on the California Water Commission Review Process, b. Update on Communication with Agencies, Stakeholders and Interested Parties, c. Consideration of Proposed Term Sheet with the District, San Benito County Water District and the Pacheco Pass Water District, and d. Update on Procurement for Engineering Design and Environmental Documentation, as well as Project Management and took no action.</p> |
| 3 | Update on the Proposed Sites Reservoir Project | May 17 | <ul style="list-style-type: none"> Receive an update on the proposed sites reservoir project. | <p>Accomplished May 17, 2018: The Committee received an update on the proposed sites reservoir project and took no action.</p> |

Yellow = Update Since Last Meeting

Blue = Action taken by the Board of Directors

Attachment 1

Page 1 of 5

2018 Work Plan: Water Storage Exploratory Committee

Update: October 2018

| ITEM | WORK PLAN ITEM | MEETING | INTENDED OUTCOME(S) | ACCOMPLISHMENT DATE AND OUTCOME |
|------|--|---|---|--|
| 4 | Update on the Los Vaqueros Expansion Project | May 17 | <ul style="list-style-type: none"> Receive an update on the Los Vaqueros Expansion Project. | <p>Accomplished May 17, 2018: The Committee received an update on the Los Vaqueros Expansion Project and took no action.</p> |
| 5 | Review of Other Potential Storage Projects including Temperance Flat Proposition 1 Application | May 17 | <ul style="list-style-type: none"> Review other potential storage projects including Temperance Flat Proposition 1 Application. | <p>Accomplished May 17, 2018: The Committee reviewed other potential storage projects including Temperance Flat Proposition 1 Application and took no action.</p> |
| 6 | Review of 2018 Water Storage Exploratory Committee Work Plan | May 17 August 15 October 1 Special Meeting November 7 | <ul style="list-style-type: none"> Review the Committee's 2018 Work Plan. | <p>Accomplished May 17, 2018: The Committee reviewed the Committee's 2018 Work Plan and took no action.</p> <p>Accomplished August 15, 2018: The Committee reviewed the Committee's 2018 Work Plan and took no action.</p> <p>Accomplished October 1, 2018: The Committee reviewed the Committee's 2018 Work Plan and took no action.</p> |
| 7 | Pacheco Reservoir Expansion Project Status | August 15 | <ul style="list-style-type: none"> Review, discuss, and provide input regarding the status of the Pacheco Reservoir Expansion Project. | <p>Accomplished August 15, 2018: The Committee discussed the status of the Pacheco Reservoir Expansion Project and took no action.</p> |

Yellow = Update Since Last Meeting

Blue = Action taken by the Board of Directors

Attachment 1

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2018 Work Plan: Water Storage Exploratory Committee

Update: October 2018

| ITEM | WORK PLAN ITEM | MEETING | INTENDED OUTCOME(S) | ACCOMPLISHMENT DATE AND OUTCOME |
|------|---|--|--|---|
| 8 | Update on Proposed Sites Reservoir Project | August 15 | <ul style="list-style-type: none"> Receive and discuss information on the Sites Reservoir Project. | <p>Accomplished August 15, 2018: The Committee received an update on the proposed Sites Reservoir Project and took no action.</p> |
| 9 | Update on Los Vaqueros Reservoir Expansion Project, in Preparation of Future Decisions regarding Project Funding and Participation Levels | August 15 | <ul style="list-style-type: none"> Receive an update on Los Vaqueros Reservoir Expansion Project, in Preparation of Future Decisions regarding Project Funding and Participation Levels. | <p>Accomplished August 15, 2018: The Committee received an update on the Los Vaqueros Reservoir Expansion Project, in Preparation of Future Decisions regarding Project Funding and Participation Levels and took no action.</p> |
| 10 | Investigation of Statewide Groundwater Storage and Banking Opportunities | August 15 | <ul style="list-style-type: none"> Receive and discuss information on staff investigation of groundwater storage and banking opportunities. | <p>Accomplished August 15, 2018: The Committee discussed staff investigation of groundwater storage and banking opportunities and took no action.</p> |
| 11 | Closed Session Anticipation of Litigation – Initiation of Litigation Pursuant to Government Code Section 54956.9(d)(4) – Four Potential Cases (Pacheco Reservoir Expansion Study) | October 1 Special Meeting November 7 | <ul style="list-style-type: none"> Discuss Closed Session Anticipation of Litigation – Initiation of Litigation Pursuant to Government Code Section 54956.9(d)(4) – Four Potential Cases (Pacheco Reservoir Expansion Study). | <p>Accomplished October 1, 2018: Closed Session Anticipation of Litigation – Initiation of Litigation Pursuant to Government Code Section 54956.9(d)(4) – Four Potential Cases (Pacheco Reservoir Expansion Study).</p> |
| 12 | Pacheco Reservoir Expansion Project Timeline Overview | October 1 Special Meeting | <ul style="list-style-type: none"> Receive and discuss Pacheco Reservoir Expansion Project Timeline Overview. | <p>Accomplished October 1, 2018: The Committee discussed Pacheco Reservoir Expansion Project Timeline Overview and took no action.</p> |

Yellow = Update Since Last Meeting

Blue = Action taken by the Board of Directors

Attachment 1

Page 3 of 5

2018 Work Plan: Water Storage Exploratory Committee

Update: October 2018

| ITEM | WORK PLAN ITEM | MEETING | INTENDED OUTCOME(S) | ACCOMPLISHMENT DATE AND OUTCOME |
|------|---|---|---|---|
| 13 | California Water Commission - Proposition 1 Water Storage Investment Program Funding Process Update | October 1 Special Meeting | <ul style="list-style-type: none"> Receive update on the California Water Commission - Proposition 1 Water Storage Investment Program Funding Process. | <p>Accomplished October 1, 2018: The Committee discussed California Water Commission - Proposition 1 Water Storage Investment Program Funding Process Update and took no action:</p> |
| 14 | Governance Representation for both Sites Reservoir and Los Vaqueros Reservoir | October 1 Special Meeting | <ul style="list-style-type: none"> Review and discuss Governance Representation for both Sites Reservoir and Los Vaqueros Reservoir. | <p>Accomplished October 1, 2018: The Committee discussed Governance Representation for both Sites Reservoir and Los Vaqueros Reservoir and took the following action:</p> <ul style="list-style-type: none"> The Committee unanimously approved to have the Board consider approval of a cost-share agreement of approximately \$200,000 for the LVE project. |
| 15 | Calero Reservoir Expansion Analysis | October 1 Special Meeting November 7 | <ul style="list-style-type: none"> Discuss Calero Reservoir Expansion Analysis. | <p>Accomplished October 1, 2018: The Committee moved this agenda item to the next meeting.</p> |
| 16 | Pacheco Reservoir Expansion Project Update | November 7 | <ul style="list-style-type: none"> Receive an update on Pacheco Reservoir Expansion Project. | |

Yellow = Update Since Last Meeting

Blue = Action taken by the Board of Directors

Attachment 1

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| ITEM | WORK PLAN ITEM | MEETING | INTENDED OUTCOME(S) | ACCOMPLISHMENT DATE AND OUTCOME |
|------|--|------------|--|---------------------------------|
| 17 | Anderson Winter Operations | November 7 | <ul style="list-style-type: none"> Receive an overview of the Anderson Winter Operations. | |
| 18 | Water Supply/Water Storage Update | November 7 | <ul style="list-style-type: none"> Receive an update on Water Supply/Water Storage. | |
| 19 | Update on Sisk Dam Raising - San Louis Low Point Alternative | November 7 | <ul style="list-style-type: none"> Receive an update on Sisk Dam Raising - San Louis Low Point Alternative. | |

Yellow = Update Since Last Meeting

Blue = Action taken by the Board of Directors

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Handouts

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Raw Water System Operations During the Construction of the Anderson Dam Project

Kurt Arends
DOO Raw Water O&M
November 7, 2018



Anderson Reservoir

HANDOUT: AGENDA ITEM 5.2

- Dam built in 1950
- Key water supply element
- Ties into raw water system
- 89,278 Acre-Feet unrestricted storage
- Emergency water source
- Fisheries and recreation
- Incidental flood protection benefits



Construction of the dam retrofit is expected to

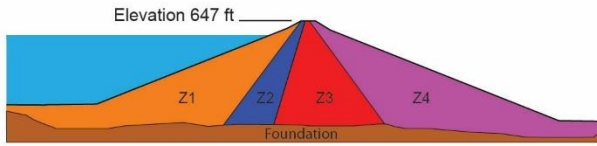
take five years to complete. During a portion of this time, the reservoir will be dewatered and remain empty.



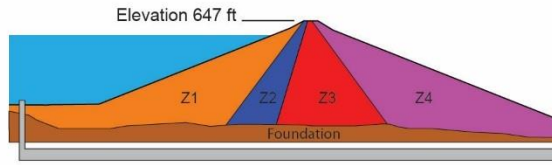
Embankment Construction Sequence

HANDOUT: AGENDA ITEM 5.2

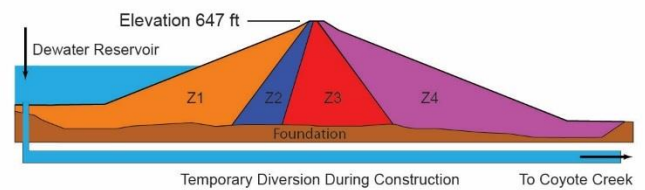
Existing Dam



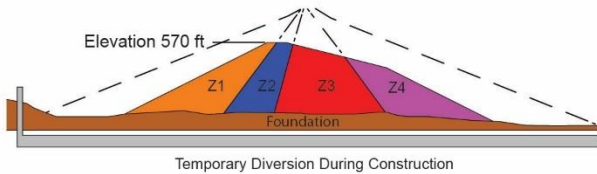
**Year 1 and 2
Diversion System Construction**



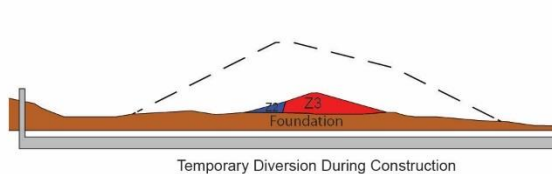
**Spring Year 3
Existing Dam Dewatering**



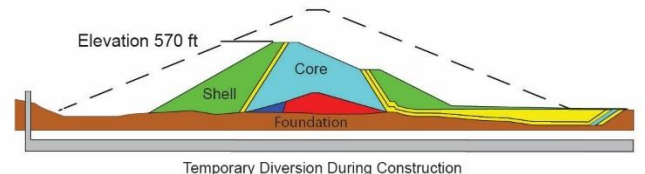
**Year 3
April – October
Stage 1 Excavation**



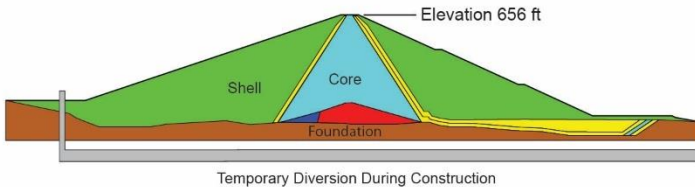
**Year 4
April – June
Stage 2 Excavation**



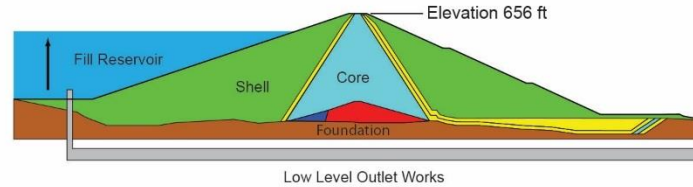
**Year 4
July – October
Stage 2 Fill**



**Year 5
April – October
Stage 3 Fill**



**Year 5 →
Final Configuration**



LEGEND

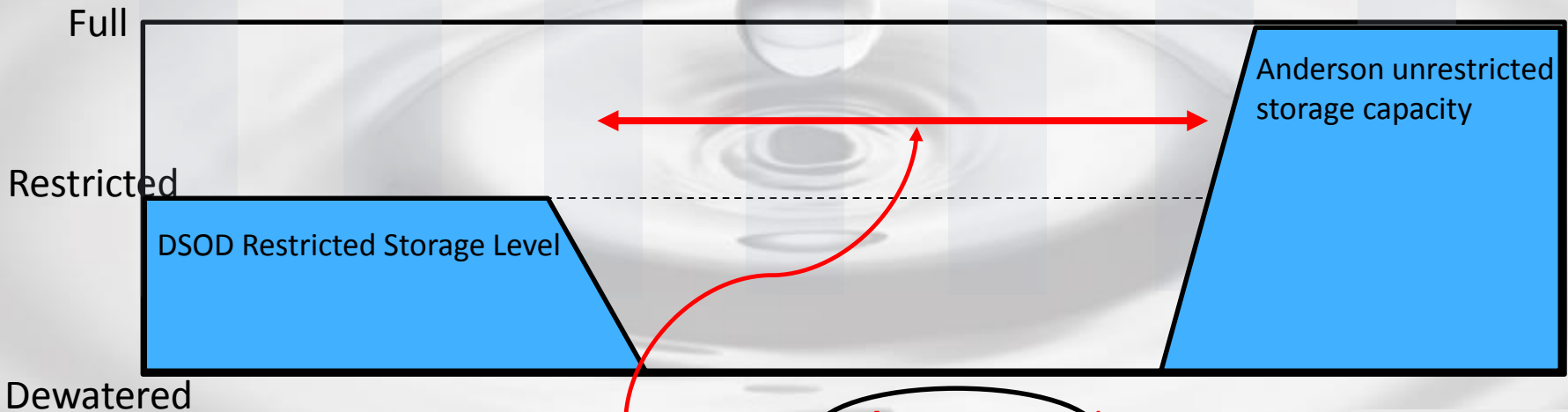
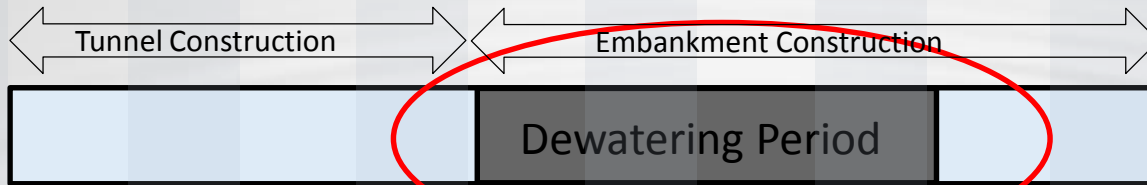
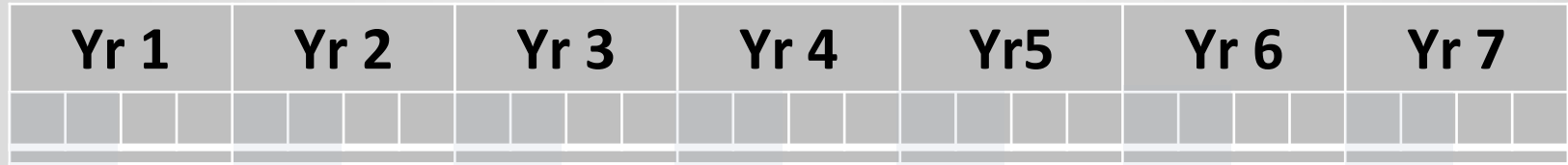
- Z1 Existing Upstream Shell
- Z2 Existing Upstream Core
- Z3 Existing Downstream Core
- Z4 Existing Downstream Shell

NOTES:
Z1 and Z4 are both Rockfill/Gravel Fill
Z2 and Z3 are both Compacted Clay Core



Anderson Dam Seismic Retrofit Project Construction Sequence

HANDOUT: AGENDA ITEM 5.2



Can assume three years when Anderson would be dewatered and not available for use.

Santa Clara Valley
Water District



Two primary roles within the Raw Water System:



1. Water Supply – the local runoff captured in Anderson helps to meet annual water demands.
2. Operational Reliability – Anderson storage is used as an emergency/backup supply to CVP imported water and to address water quality issues with imported CVP supplies.





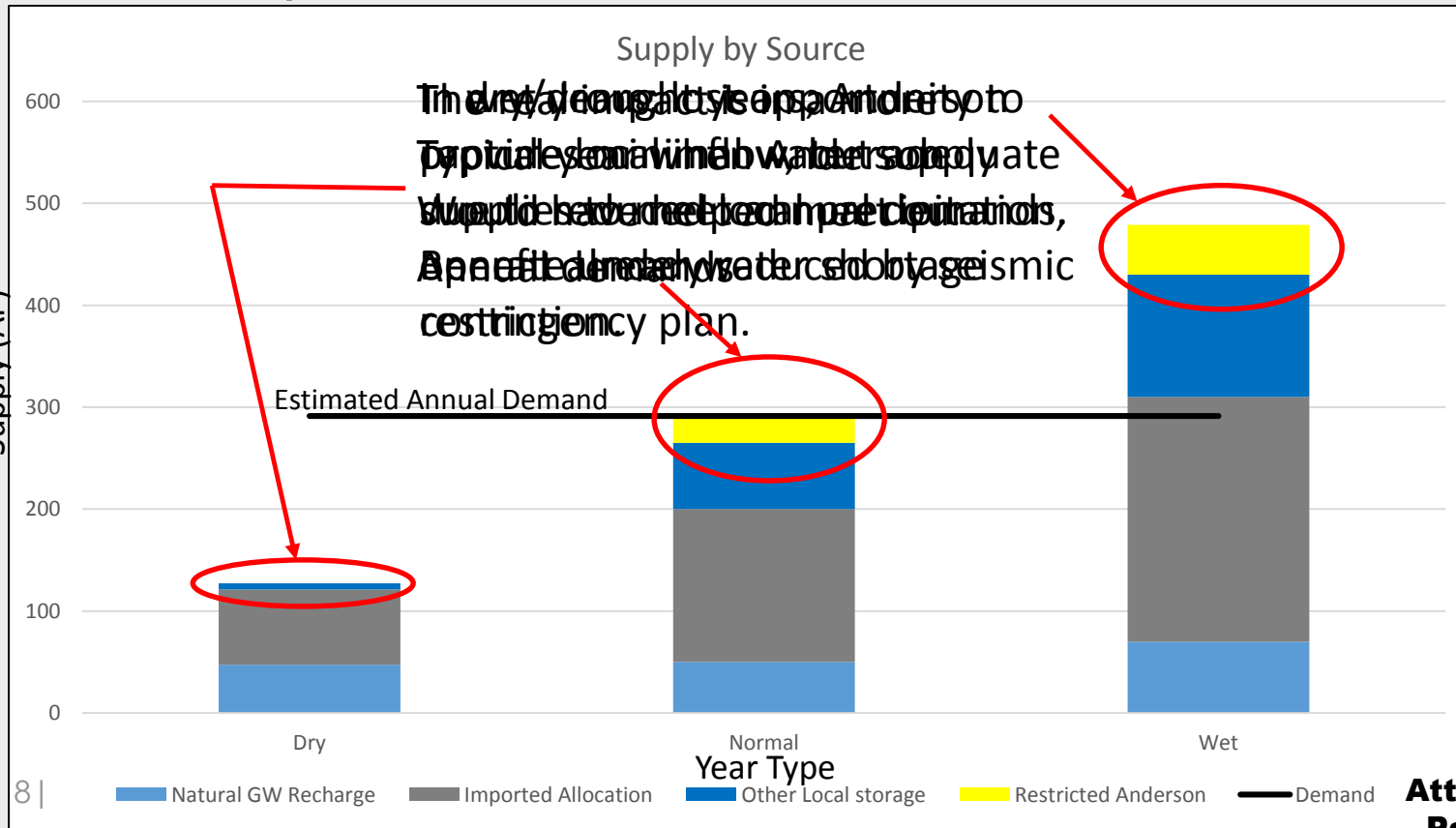
Risk to Water Supply



Water Supply

Look at three general scenarios:

1. Dry year
2. Normal/typical year
3. Wet year

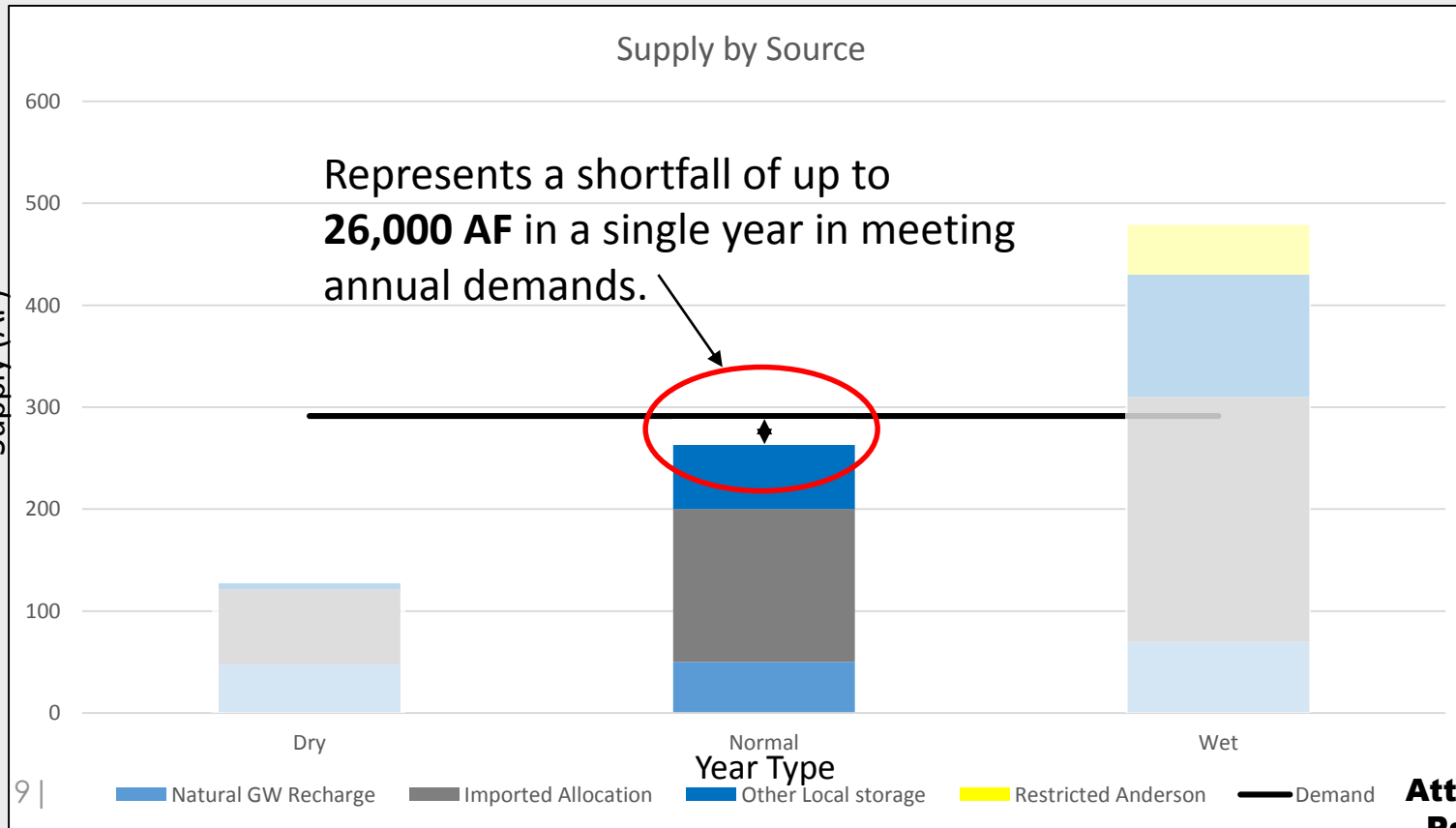


Water Supply

In a Normal/typical year:



If this scenario occurred in those three consecutive years of construction, this could represent an accumulative **78,000 AF** over three years.



Risk = 78,000 AF over three years

Mitigation:

- Encourage groundwater use **Limited conditions**
- Semitropic storage
- Carryover supplies in San Luis Reservoir
- Explore storage in Los Vaqueros
- Arrange water transfers or options
- Water purchases
- Call for shortage reductions
- Other?



Considerations as we near construction:

- Groundwater levels
- Semitropic storage
- Local supplies
- Water availability
- Infrastructure conditions
- Project schedule
- Demand trends
- other?



Prior to the start of Construction,
(2 to 3 years before dewatering),
staff will :



- Present an update of risks and considerations.
- Present mitigation options and opportunities.
- Provide a staff recommendation





Risk to Operational Reliability



How the system operates on a day-to-day basis and how the raw water system delivers supplies to the water treatment plants.



During the construction of the Anderson Dam Seismic Retrofit Project, while the reservoir is dewatered, interruptions in the District's imported water supplies will likely occur.

Depending on the time of year, demands on the system will change.

Operating conditions and demands will determine potential impacts.



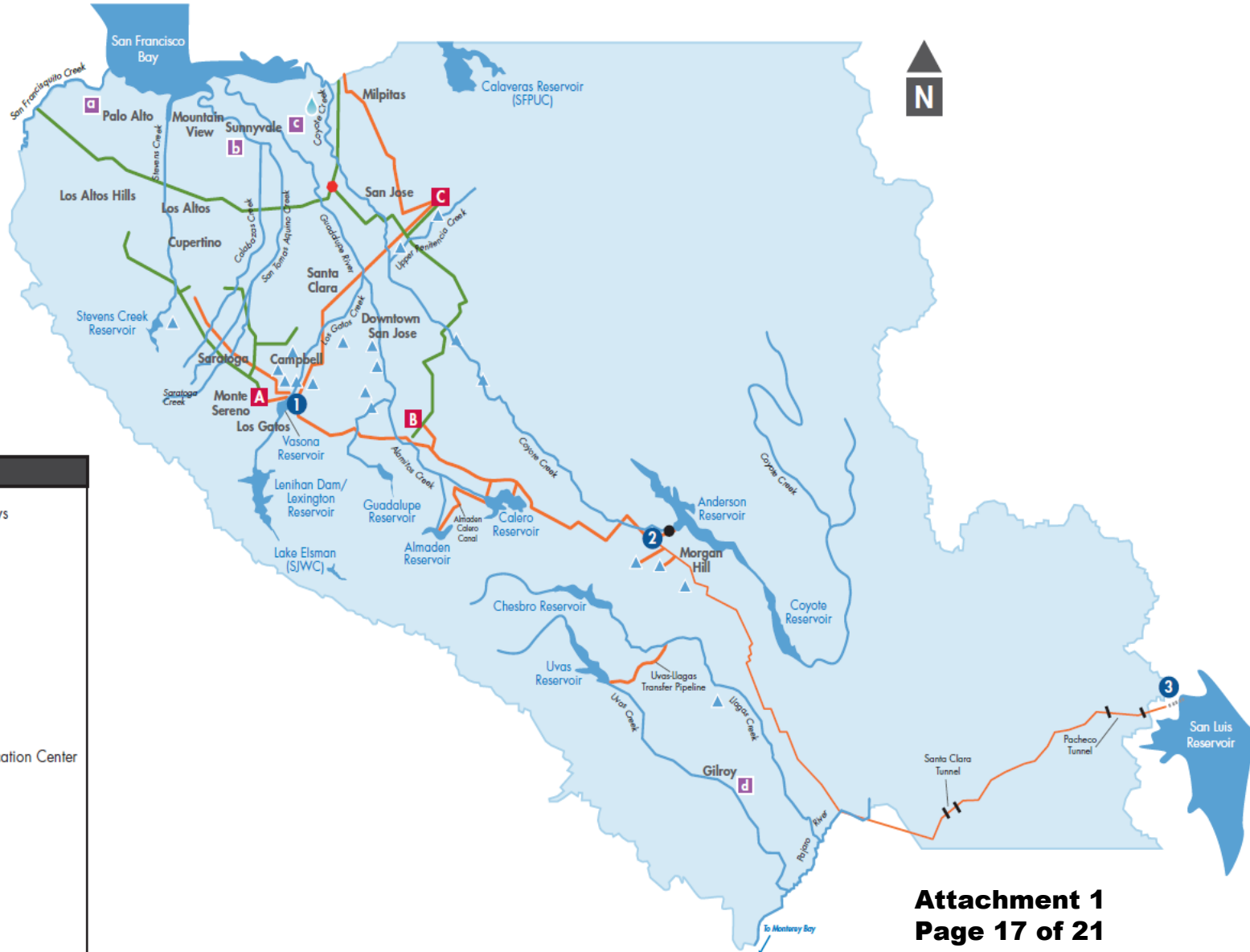
Completion of the Anderson Reservoir project is critical to restoring reliability.

Without Anderson, the only local storage available is the restricted Calero reservoir.



Water Supply Map

District map Water Supply Distribution



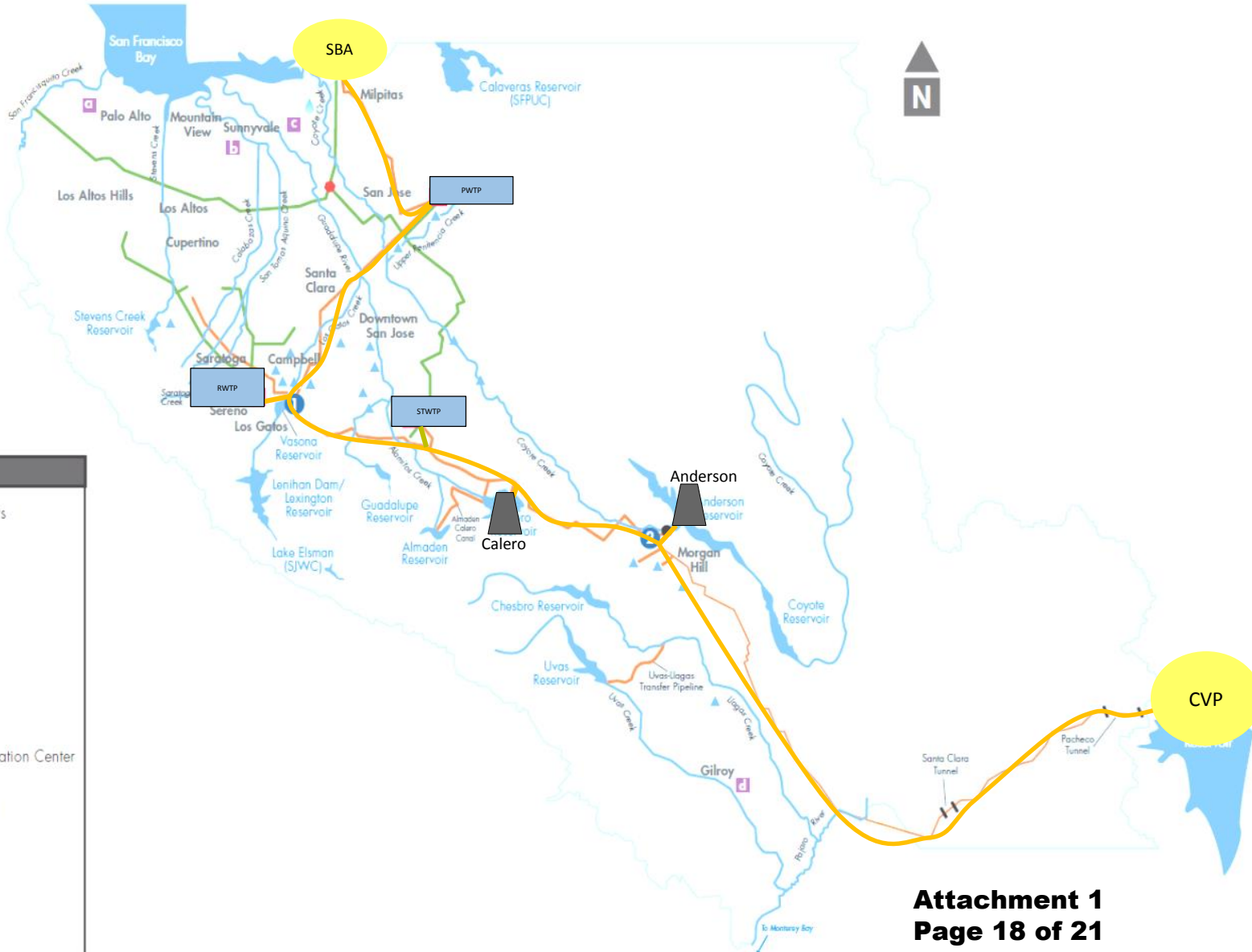
Legend

- Lakes, reservoirs, rivers, creeks, & bays
- Raw water pipeline
- Drinking water pipeline
- Pump Plants
 - 1. Vasona
 - 2. Coyote
 - 3. Pacheco
- Drinking Water Treatment Plants
 - A. Rinconada
 - B. Santa Teresa
 - C. Penitencia
- Silicon Valley Advanced Water Purification Center
- Anderson Hydroelectric Facility
- Local wastewater treatment plant and recycled water provider
 - a. Palo Alto
 - b. Sunnyvale
 - c. San Jose-Santa Clara
 - d. South County
- Recharge Ponds

Operational Reliability

HANDOUT: AGENDA ITEM 5.2

District map Water Supply Distribution



Legend

- ~ Lakes, reservoirs, rivers, creeks, & bays
- Raw water pipeline
- Drinking water pipeline
- Pump Plants
 1. Vasona
 2. Coyote
 3. Pacheco
- Drinking Water Treatment Plants
 - A. Rinconada
 - B. Santa Teresa
 - C. Penitencia
- ▲ Silicon Valley Advanced Water Purification Center
- Anderson Hydroelectric Facility
- Local wastewater treatment plant and recycled water provider
 - a. Palo Alto
 - b. Sunnyvale
 - c. San Jose-Santa Clara
 - d. South County
- ▲ Recharge Ponds

A loss of SBA supply can typically be mitigated by CVP supply.

Loss of CVP supply can impact treated water deliveries.

Loss of both SBA and CVP will limit treated water deliveries to Calero outflow and SFPUC intertie supplies. Retailers would be asked to use GW.



Work to make imported supplies as reliable as possible for deliveries during construction.

Work closely with retailers on risks and contingency plans.



Questions?

