June 21, 2019

MEETING NOTICE & REQUEST FOR RSVP

TO: AGRICULTURAL WATER ADVISORY COMMITTEE

Jurisdiction	Representative
District 1	Russ Bonino, Mitchell Mariani
District 2	James Provenzano
District 3	William Cilker, David Vanni
District 4	Brent Bonino
District 5	Jan F. Garrod, Michael Miller
District 6	Robert Long
District 7	Sandra Carrico
Santa Clara County Farm Bureau	Sheryl O. Kennedy
Loma Prieta Resource Conservation District	George Fohner
Private Well Owner (Non Retail)	Dhruv Khanna

The regular meeting of the Agricultural Water Advisory Committee is scheduled to be held on **Monday, July 1, 2019, at 1:30 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. Additional copies of this meeting packet are available on our new website at https://www.valleywater.org/how-we-operate/committees/board-advisory-committees.

A majority of the appointed membership is required to constitute a quorum, which is fifty percent plus one. A quorum for this meeting must be confirmed at least 48 hours prior to the scheduled meeting date or it will be canceled.

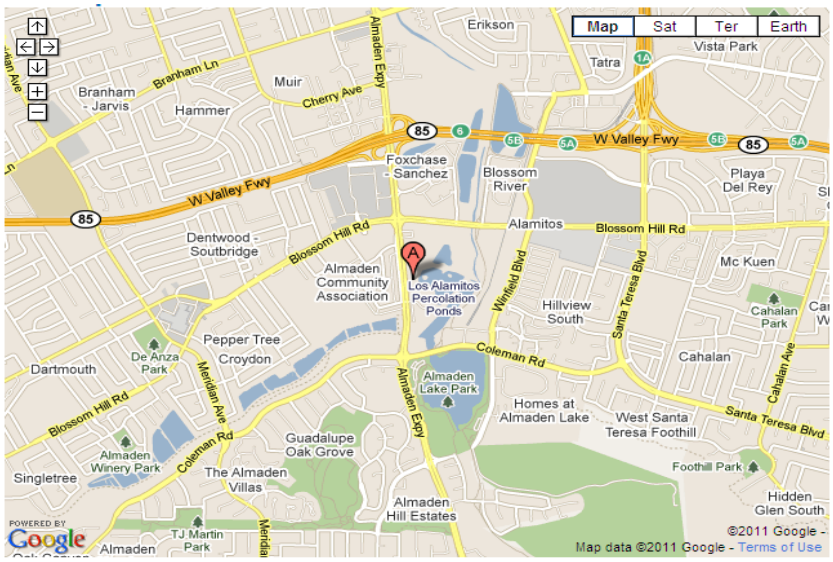
Further, a quorum must be present on the day of the scheduled meeting to call the meeting to order and take action on agenda items.

Members with two or more consecutive unexcused absences will be subject to rescinded membership.

Please confirm your attendance no later than **1:00 p.m., Thursday, June 27, 2019,** by contacting Ms. Glenna Brambill at 1-408-630-2408, or gbrambill@valleywater.org.

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
Agricultural Water Advisory Committee Meeting

HQ Boardroom
5700 Almaden Expressway
San Jose, CA 95118

REGULAR MEETING
AGENDA

Monday, July 1, 2019
1:30 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
Agricultural Water Advisory Committee

REGULAR MEETING
AGENDA

Monday, July 1, 2019 | **1:30 PM** | **HQ Boardroom**

1. CALL TO ORDER:

1.1. Roll Call.

2. 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.

3. APPROVAL OF MINUTES:

3.1. Approval of Minutes. 19-0600

Recommendation: Approve the April 8, 2019, Meeting Minutes.
Manager: Michele King, 408-630-2711
Attachments: Attachment 1: 040819 Ag Wtr DRAFT Mins
Est. Staff Time: 5 Minutes

4. STANDING ITEMS REPORTS:

4.1. Standing Items Report. 19-0605

Recommendation: A. For the Agricultural Water Advisory Committee to receive information on the Board's priorities on the following subjects:

1. Finalize the Fisheries and Aquatic Habitat Collaborative Effort (FAHCE). (Assigned to FAHCE) *Nothing to report at this time!*
2. Actively Pursue Efforts to Increase Water Storage Opportunities. (Assigned to Water Storage Exploratory Committee) S*ee Attachment 1.*
3. Actively Participate in Decisions Regarding the California Delta Conveyance. (Assigned to California Delta Conveyance Working Group) *Nothing to report at this time!*
4. Lead Recycled and Purified Water Efforts with the City of San Jose and Other Agencies. (Assigned to Recycled Water Committee) *Valley Water and Cities of Palo Alto and Sunnyvale have been discussing recycled and purified water expansions. During the Joint Recycled Water Policy Advisory Committee meeting on Dec. 3, 2018, Cities of San Jose and Santa Clara have plans to expand the Recycled Water systems in their service areas as well as the City of Milpitas.*
5. Engage and educate the community, local elected officials and staff on future water supply strategies in Santa Clara County. (Assigned to Water Conservation and Demand Management Committee) *Nothing to report at this time!*
6. Advance Anderson Dam Seismic Retrofit Project. (Assigned to Capital Improvement Program Committee) *Nothing to report at this time!*
7. Provide for a Watershed-Wide Regulatory Planning and Permitting Effort. (Assigned to FAHCE) *Nothing to report at this time!*
8. Attain net positive impact on the environment when implementing Valley Water's mission. *Nothing to report at this time!*
9. Promote the protection of creeks, bay, and other aquatic ecosystems from threats of pollution and degradation (E-4.1.3). (Assigned to Homeless Encampment Ad Hoc Committee) *Nothing to report at this time!*
10. Advance Diversity and Inclusion Efforts. Carry forward to

FY20. (Assigned to Diversity and Inclusion Ad Hoc Committee) *Nothing to report at this time!*

11. Understand if the level of services Valley Water provides to the public are reasonable and the costs of providing services are affordable and effective. (Assigned to Revenue Working Group) *The Group has started working on this, however, there is nothing to report at this time!*

B. This is informational only and no action is required.

Manager: Michele King, 408-630-2711

Attachments: Attachment 1: #2 WSEC Report

5. ACTION ITEMS:

5.1. Update on Water Supply Master Plan 2040 19-0601

Recommendation: This is a discussion item and no action is required. However, the Committee may make recommendations for Board consideration.

Manager: Jerry De La Piedra, 408-630-2257

Attachments: Attachment 1: Staff Presentation
Attachment 2: Risk Ranking Report
Attachment 3: Draft Implementation Schedule

Est. Staff Time: 20 Minutes

5.2. Discuss Proposed Collaborative to Identify Sources of Revenue to Subsidize Agricultural Water Rates. 19-0602

Recommendation: This is a discussion item and no action is required. However, the Committee may make recommendations on the proposed collaborative process and membership.

Manager: Michele King, 408-630-2711

Attachments: Attachment 1: OSC Agenda Memo-Board

Est. Staff Time: 25 Minutes

5.3. Discuss Agricultural Water Use Baseline Study. 19-0603

Recommendation: This is a discussion item and the Committee may provide comments; however, no action is required.

Manager: Jerry De La Piedra, 408-630-2257

Est. Staff Time: 20 Minutes

5.4. Review Agricultural Water Advisory Committee Work Plan, the Outcomes of Board Action of Committee Requests; and the Committee's Next Meeting Agenda. 19-0604

Recommendation: Review the Committee 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: 2019 Ag Water Work Plan
Attachment 2: 100719 Ag Wtr Draft Agenda

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. REPORTS:

7.1. Director's Report

7.2. Manager's Report

7.3. Committee Member Report

7.4. Links to Informational Reports
https://www.valleywater.org/sites/default/files/2019-06/Wate%20June%202019.pdf

8. ADJOURN:

8.1. Adjourn to Regular Meeting at 1:30 p.m., on October 7, 2019, in the Santa Clara Valley Water District (HQ Boardroom/Board Conference Room A-124), 5700 Almaden Expressway, San Jose, California.

This Page Intentionally Left Blank

Santa Clara Valley Water District

File No.: 19-0600

Agenda Date: 7/1/2019
Item No.: 3.1.

COMMITTEE AGENDA MEMORANDUM

Agricultural Water Advisory Committee

SUBJECT:
Approval of Minutes.

RECOMMENDATION:
Approve the April 8, 2019, 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: 040819 Draft Meeting Minutes.

UNCLASSIFIED MANAGER:
Michele King, 408-630-2711

This Page Intentionally Left Blank

AGRICULTURAL WATER ADVISORY COMMITTEE MEETING

DRAFT MINUTES

MONDAY, APRIL 8, 2019
1:30 PM

A regularly scheduled meeting of the Agricultural Water Advisory Committee was held on April 8, 2019, in the Headquarters Building Boardroom at the Santa Clara Valley Water District, 5700 Almaden Expressway, San Jose, California.

1. CALL TO ORDER/ROLL CALL

Chair David Vanni called the meeting to order at 1:32 pm.

Members in attendance were:

Jurisdiction	Representative
District 1	Russ Bonino
District 3	William Cilker
	David Vanni
District 4	Brent Bonino
District 5	Jan Garrod
	Michael Miller
District 6	Robert Long
District 7	Sandra Carrico*
Private Well Owner (Non Retail)	Dhruv Khanna
Santa Clara County Farm Bureau	Sheryl O. Kennedy
Loma Prieta Resource Conservation District	George Fohner

Member not in attendance was:

Jurisdiction	Representative
District 1	Mitchell Mariani
District 2	James Provenzano

*Committee members arrived as noted below.

Board members in attendance were: Director Nai Hsueh, Board Alternate, Director Richard P. Santos, and Director John L. Varela, Board Representatives.

Staff members in attendance were: Hossein Ashktorab, Joseph Atmore, Lisa Bankosh, Glenna Brambill, Jerry De La Piedra, Vanessa De La Piedra, Samantha Greene, Eric Leitterman, Anthony Mendiola, Paul Randhawa, Afshin Rouhani and Darin Taylor.

New Member Mr. Brent Bonino of District 4 was introduced.

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

There was no one present who wished to speak.

3. APPROVAL OF MINUTES

3.1 APPROVAL OF MINUTES

It was moved by Mr. Michael Miller, seconded by Ms. Sheryl Kennedy and unanimously carried to approve the January 7, 2019, Agricultural Water Advisory Committee meeting minutes, as presented.

4. STANDING ITEMS REPORT

Chair David Vanni and Director Nai Hsueh gave an overview of the new standing agenda item.

There was a question on Item #7 (Ensure Immediate Emergency Action Plans and Flood Protection are Provided for Coyote Creek), use of Hydro models, land uses, subsequent lands, use of ag lands and open space.

Mr. Afshin Rouhani was available to answer questions.

*Ms. Sandra Carrico arrived at 1:38 p.m.

The Committee took no action.

5. ACTION ITEMS

5.1 REVIEW AND COMMENT TO THE BOARD ON THE FISCAL YEAR 2019-20 PROPOSED GROUNDWATER PRODUCTION CHARGES

Mr. Darin Taylor reviewed the materials as outlined in the agenda. The Protection and Augmentation of Water Supplies (PAWS) report was distributed.

Mr. Dhruv Khanna, Ms. Sheryl Kennedy, Director Richard P. Santos, Ms. Sandra Carrico, Mr. Jan Garrod and Director John L. Varela spoke on the following: Anderson Dam Retrofit, public safety, bond measures, property taxes, recycled water usage, Williamson Act properties, lowering of rates, keeping rates equal, water supply, the ad valorem tax, and additional meetings on the proposed groundwater production charges.

Mr. Afshin Rouhani, Mr. Hossein Ashktorab, Mr. Jerry De La Piedra were also available to answer questions.

The Committee took the following action:
It was moved by Mr. Dhruv Khanna, seconded by Ms. Sheryl Kennedy and the motion failed to approve that the Board reject the Committee's opposition to staff's proposal of 19.3% increase of groundwater production charge rate.

The motion failed: 3 Ayes, 5 Nays, 3 abstained.

5.2 UPDATE ON OPEN SPACE CREDIT

Mr. Joseph Atmore reviewed the materials as outlined in the agenda.

Ms. Sandra Carrico, Mr. Jan Garrod, Ms. Sheryl Kennedy, Mr. George Fohner, Directors John L. Varela and Richard P. Santos and Mr. Russ Bonino spoke on the following: growing leafy greens indoor; Valley Water putting pressure on retailers to keep rates low on water bills, staff was thanked for a thorough response on this issue, comprehensive ag land and flood protection value, is 10% a hard number, ag community taking the brunt of the increase, more Board hearings (meetings) on this issue, delaying increase for 2 years and concern about the Williamson Act properties.

Mr. Darin Taylor was available to answer questions.

The Committee took the following action:
It was moved by Ms. Shery Kennedy, seconded by Mr. Michael Miller, and unanimously carried that the Committee approve submitting the following letter to the Board of Directors, April 8, 2019:

The AWAC opposes the proposed changes in the Open Space Credit policy at this time.

Members of the AWAC currently have the understanding that:
1) Valley Water apparently at this time does not have a precise, comprehensive valuation of the benefits that agricultural lands and open space provide in Santa Clara County with respect to mitigating flood risk,
2) Valley Water apparently at this time does not have precise estimates of the effect on flood risk that would result from various levels of urbanization of agricultural lands and open space in Santa Clara County,
3) Diverting funding from the Open Space Credit for the purpose of flood control may be counterproductive, and maintaining agricultural lands and open space may be among the most cost effective means of mitigating flood risk,
4) Agricultural land that is not under Williamson Act or conservation easement is the land that is most at risk for conversion to non-agricultural use.
5) At the moment when the County of Santa Clara has just launched a comprehensive Agricultural Plan with state and county funding to sustain agriculture and retain its many important benefits, this would be an unfortunate time to raise the cost of groundwater to most agricultural producers by almost 20%, and would undermine the hoped-for trust and collaborative spirit among diverse interests that will be needed for success of the plan.
6) Headlines about the proposed reduction in Open Space Credit might well read: Valley Water hits farmers with 20% increase in water costs at time when county launches major effort to preserve threatened farming and open space and Valley Water's price hike to farmers in response to 2017 flooding may increase flood risks and costs.

The Committee took the following action:
It was moved by Ms. Shery Kennedy, no second was received, therefore, the motion failed, that the Committee approve urging the Valley Water Board to freeze agricultural groundwater production charges unless and until there are corresponding and material reductions in the county's land use development regulations of ag land.

5.3 USING OPEN SPACE TO CAPTURE AND RECHARGE STORMWATER
Ms. Samantha Greene reviewed the materials as outlined in the agenda

Mr. George Fohner and Mr. Jan Garrod spoke on the following: inviting staff to make a presentation on this topic at their agency and are there any studies on where the water goes.

Mr. Jerry De La Piedra and Ms. Vanessa De La Piedra were available to answer questions.

The Committee took no action.

5.4 REVIEW AGRICULTURAL WATER ADVISORY COMMITTEE WORK PLAN, THE OUTCOMES OF BOARD ACTION OF COMMITTEE REQUESTS; AND THE COMMITTEE'S NEXT MEETING AGENDA
Ms. Glenna Brambill Committee Liaison reviewed the materials as outlined in the agenda.

The Committee took no action.

6. CLERK REVIEW AND CLARIFICATION OF COMMITTEE REQUESTS TO THE BOARD
Ms. Glenna Brambill reported there was one action item for Board consideration.

Agenda Item 5.2
The Committee approved to send a letter to the Board with the following information:
April 8, 2019

The AWAC opposes the proposed changes in the Open Space Credit policy at this time.

Members of the AWAC currently have the understanding that:
1) Valley Water apparently at this time does not have a precise, comprehensive valuation of the benefits that agricultural lands and open space provide in Santa Clara County with respect to mitigating flood risk,
2) Valley Water apparently at this time does not have precise estimates of the effect on flood risk that would result from various levels of urbanization of agricultural lands and open space in Santa Clara County,
3) Diverting funding from the Open Space Credit for the purpose of flood control may be counterproductive, and maintaining agricultural lands and open space may be among the most cost effective means of mitigating flood risk,
4) Agricultural land that is not under Williamson Act or conservation easement is the land that is most at risk for conversion to non-agricultural use.
5) At the moment when the County of Santa Clara has just launched a comprehensive Agricultural Plan with state and county funding to sustain agriculture and retain its many important benefits, this would be an unfortunate time to raise the cost of groundwater to most agricultural producers by almost 20%, and would undermine the hoped-for trust and collaborative spirit among diverse interests that will be needed for success of the plan.
6) Headlines about the proposed reduction in Open Space Credit might well read: Valley Water hits farmers with 20% increase in water costs at time when county launches major effort to preserve threatened farming and open space and Valley

Water's price hike to farmers in response to 2017 flooding may increase flood risks and costs.

7. REPORTS

7.1 Director's Report

Director John L. Varela reported on the following:

- Meeting on 4/10/19, 6:30 p.m., at the Morgan Hill Community Center to discuss an update on the Anderson Dam
- A public hearing on 4/11/19, 7:00 p.m. on groundwater production charges at the Morgan Hill City Chambers

Director Nai Hsueh reported briefly on the following:

- The Committee's July Agenda will discuss the Water Supply Master Plan which connects with the Board's 2020 focus

Director Richard P. Santos reported briefly on the following:

- Staff does a great job of providing information but ultimately, the Board, as elected officials, make decisions for Valley Water and are the ones to be held accountable

7.2 Manager's Report

Ms. Vanessa De La Piedra reported on the following:

- Water Supply and groundwater basins are in great shape

7.3 Committee Member Reports

Mr. Jan Garrod reported on the following:

- Concerned about the District and County not working together in land use matters.

It was moved by Mr. Jan Garrod, second by Ms. Sandra Carrico, unanimously carried to have the Board of Directors be more proactive in working with the County regarding land use issues. Director Richard P. Santos advised the Committee that the Board of Directors will need to be advised about County meetings on these issues to be engaged.

Mr. Robert Long reported on the following:

- Planting of alfalfa—water wasn't pure enough for eating
  Like to plant with clean water and how it's processed

7.4 Committee Member Reports

- None
- The Committee would like to receive Water Tracker reports in the future

8. ADJOURNMENT

Chair David Vanni adjourned at 3:44 pm to the next regular meeting on Monday, July 1, 2019, at 1:30 pm, in the Santa Clara Valley Water District Headquarters Building Boardroom.

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

Approved:

File No.: 19-0605

Agenda Date: 7/1/2019
Item No.: 4.1.

COMMITTEE AGENDA MEMORANDUM

Agricultural Water Advisory Committee

SUBJECT:
Standing Items Report.

RECOMMENDATION:
A. For the Agricultural Water Advisory Committee to receive information on the Board's priorities on the following subjects:
1. Finalize the Fisheries and Aquatic Habitat Collaborative Effort (FAHCE). (Assigned to FAHCE) *Nothing to report at this time!*
2. Actively Pursue Efforts to Increase Water Storage Opportunities. (Assigned to Water Storage Exploratory Committee) S*ee Attachment 1.*
3. Actively Participate in Decisions Regarding the California Delta Conveyance. (Assigned to California Delta Conveyance Working Group) *Nothing to report at this time!*
4. Lead Recycled and Purified Water Efforts with the City of San Jose and Other Agencies. (Assigned to Recycled Water Committee) *Valley Water and Cities of Palo Alto and Sunnyvale have been discussing recycled and purified water expansions. During the Joint Recycled Water Policy Advisory Committee meeting on Dec. 3, 2018, Cities of San Jose and Santa Clara have plans to expand the Recycled Water systems in their service areas as well as the City of Milpitas.*
5. Engage and educate the community, local elected officials and staff on future water supply strategies in Santa Clara County. (Assigned to Water Conservation and Demand Management Committee) *Nothing to report at this time!*
6. Advance Anderson Dam Seismic Retrofit Project. (Assigned to Capital Improvement Program Committee) *Nothing to report at this time!*
7. Provide for a Watershed-Wide Regulatory Planning and Permitting Effort. (Assigned to FAHCE) *Nothing to report at this time!*
8. Attain net positive impact on the environment when implementing Valley Water's mission. *Nothing to report at this time!*
9. Promote the protection of creeks, bay, and other aquatic ecosystems from threats of pollution and degradation (E-4.1.3). (Assigned to Homeless Encampment Ad Hoc Committee) *Nothing to report at this time!*
10. Advance Diversity and Inclusion Efforts. Carry forward to FY20. (Assigned to Diversity and Inclusion Ad Hoc Committee) *Nothing to report at this time!*
11. Understand if the level of services Valley Water provides to the public are reasonable and the

costs of providing services are affordable and effective. (Assigned to Revenue Working Group)
The Group has started working on this, however, there is nothing to report at this time!

B. This is informational only and no action is required.

SUMMARY:
The Agricultural Water Advisory Committee was established to assist the Board with policy review and development, provide comment on activities in the implementation of the District mission, and to identify Board-related issues.

On March 12, 2019, the Board of Directors approved aligning the Board Advisory Committees' agendas and work plans with the Board's yearly work plan.

The new agenda format will allow regular reports on the Board's priorities from the Board's committees and/or Board committee representative and identify subjects where the committees could provide advice to the Board on pre-identified subjects in a timely manner to meet the Board's schedule, and distribute information/reports that may be of interest to committee members.

ATTACHMENTS:
Attachment 1: Standing Items Report

UNCLASSIFIED MANAGER:
Michele King, 408-630-2711

#2 Standing Items Report
Water Storage Exploratory Committee Meeting, May 20, 2019

Los Vaqueros Reservoir Expansion Project

Background

Los Vaqueros is an off-stream reservoir located in the foothills west of the Delta in Contra Costa County. Los Vaqueros was initially constructed by the Contra Costa Water District (CCWD) in 1998 with a capacity of 100,000 acre-feet (AF) and then expanded to 160,000 AF in 2012. The original reservoir and first expansion were completed on time, within budget, and without opposition. The Los Vaqueros Expansion (LVE) Project would increase the reservoir capacity to 275,000 AF and build the Transfer-Bethany Pipeline, which would connect CCWD's system to the California Aqueduct at Bethany Reservoir. Regardless of whether the Santa Clara Valley Water District (Valley Water) stores water in the expanded Los Vaqueros Reservoir, imported water could be moved from CCWD's intakes in the Delta to Valley Water's system without relying on the South-of- Delta pumps. Water delivered through the Transfer-Bethany Pipeline would then continue through the South Bay Aqueduct (SBA) to Santa Clara County. Valley Water staff are evaluating the water supply benefit of the LVE Project and Transfer Bethany Pipeline and the conveyance capacity of the SBA and Valley Water facilities for conveying LVE Project water.

Project Participants

The LVE Project started with 14 Local Agency Partners (LAP). Since then, Eastern Contra Costa Irrigation District has left the project and four members have consolidated under the San Luis & Delta Mendota Water Authority. Therefore, there are currently nine (9) LAPs (not including CCWD), and they are:

1. Alameda County Water District
2. Bay Area Water Supply & Conservation Agency
3. City of Brentwood
4. East Bay Municipal Utility District
5. Grassland Water District
6. Santa Clara Valley Water District
7. San Francisco Public Utilities Commission
8. Zone 7 Water Agency
9. San Luis & Delta Mendota Water Authority
   - 9.1. Byron Bethany Irrigation District
   - 9.2. Del Puerto Water District
   - 9.3. Panoche Water District
   - 9.4. Westlands Water District

Total Project Cost

The total project implementation cost of the LVE Project based on assumptions made in the Proposition 1 Water Storage Investment Program (WSIP) application is approximately $980 million in 2015 constant dollars. LVE Project Cost in 2018 constant dollars is $864 million. The LVE Project costs have decreased due to the elimination of project elements no longer needed, such as the East Contra Costa Irrigation District interconnection pipeline and an improved alignment for the Transfer-Bethany Pipeline. CCWD received the maximum eligibility award for WSIP funding of $459 million. In addition, California Water Commission (CWC) authorized $13.65 million in early funding for planning and design and CCWD received an eligibility award of $2.15 million in federal funding for planning and design through the Water Infrastructure Improvement for the Nation Act (WIIN Act).

In 2016, Valley Water Board of Directors authorized the CEO to execute an agreement to participate in the LVE Project and contribute $100,000 to support CCWD's Proposition 1 WSIP application. In 2019, the Board authorized the CEO to execute an agreement to continue its participation in the LVE Project and contribute $315,000 to continue various planning, permitting and design efforts. Additionally, some of these funds will be used as matching local funds required by WSIP and the WIIN Act.

Project Governance

The LVE Project currently is being led by CCWD. CCWD's financial consultant will work with the LAPs to develop a JPA agreement, anticipated to be established in 2020. The LAPs are planning to hire independent special counsel to represent them during JPA formation (Attachment 2). To participate in the special counsel selection process, each LAP and CCWD can designate an attorney or senior manager to serve on the ad hoc legal work group. Once the JPA is in place, responsibilities such as project financing and executing agreements will transition from CCWD to the JPA.

Potential Valley Water Benefits

The LVE Project water supply and operational benefits could be realized by diverting State Water Project (SWP), Central Valley Project (CVP), and/or surplus water without relying on the South-of-Delta pumps for direct delivery through Transfer Bethany Pipeline or pumped into an expanded Los Vaqueros Reservoir for later delivery. Pending further analysis, the LVE Project may provide the following benefits to Valley Water:

- An increase in water supply, primarily in dry years;
- Banking capacity of SWP and CVP contract supplies in an expanded Los Vaqueros Reservoir;
- Alternate points of diversion during periods when SWP and CVP exports are restricted by regulatory requirements that do not apply to CCWD diversions;
- Operational flexibility by conveying imported water from the California Aqueduct through the Transfer-Bethany Pipeline; and
- Improved operational flexibility of regional projects (e.g., desalination, refinery recycled water exchange, Bay Area Regional Reliability water market) by providing an additional conveyance path via Transfer-Bethany Pipeline.

The extent to which these benefits may be realized depends on several issues that have yet to be resolved, including the level of participation (i.e., with or without storage in Los Vaqueros), permit requirements, regulatory conditions, adequate conveyance capacity in the SBA and Valley Water infrastructure, integration of operations with SWP and CVP, and integration of operations with existing and proposed Valley Water operations and infrastructure.

Valley Water staff continues to participate in the LVE Project discussions and is working with regional partners to evaluate system constraints. Staff is collaborating with SBA contractors and neighboring LAPs to assess SBA and Valley Water infrastructure (e.g., water treatment plants, Milpitas Intertie) capacity requirements and availability to deliver LVE Project water to Valley Water and neighboring LAPs.

Next Steps

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

- Spring/Summer 2019 - Form committee to select outside counsel to form JPA
- Summer 2019 – Review of user fees by third party consultant
- 2019/2020 – Conduct and review various financial model scenarios
- 2020 – Formation of JPA

The Committee discussed the following: Contra Costa Water District's (CCWD) contributions, water rights, conveying water, project benefits, Purissima Hills Water District and California Water Service Company nexus and next steps.

The Committee took no action.

This Page Intentionally Left Blank

File No.: 19-0601

Agenda Date: 7/1/2019
Item No.: 5.1.

COMMITTEE AGENDA MEMORANDUM

Agricultural Water Advisory Committee

SUBJECT:
Update on Water Supply Master Plan 2040

RECOMMENDATION:
This is a discussion item and no action is required. However, the Committee may make recommendations for Board consideration.

SUMMARY:
The Water Supply Master Plan (Master Plan) is the Santa Clara Valley Water District's (Valley Water) strategy for providing a reliable and sustainable water supply in a cost-effective manner consistent with Board Policy E-2. - "There is a reliable, clean water supply for current and future generations." The current draft (hard copies to be provided at the meeting) is an update to the 2012 Water Supply and Infrastructure Master Plan. The plan informs investment decisions by describing the type and level of water supply investments Valley Water is planning to make through 2040, the anticipated schedule, the associated costs and benefits, and how Master Plan implementation will be monitored and adjusted.

This memorandum summarizes the water supply strategy for the Master Plan, updates to Valley Water's water supply reliability level of service goal, discusses the additional water supplies needs, proposed water supply investments, how the Master Plan will be monitored and assessed, and next steps.

Water Supply Strategy
The Master Plan builds upon the Board's 2012 investment strategy "Ensure Sustainability" which is comprised of three elements:

1. Secure existing supplies and infrastructure,
2. Expand water conservation and reuse, and
3. Optimize the use of existing supplies and infrastructure.

The three elements of the strategy work together to provide a framework for delivering a sustainable and reliable water supply. These elements protect and build on past investments in water supply reliability, leverage those investments, and develop alternative supplies and demand management measures to manage risk and meet future needs, especially during extended droughts in a changing climate.

Water Supply Reliability Level of Service Goal

The water supply reliability level of service goal is important because it guides long-term water supply planning efforts and informs Board decisions regarding long-term investments. Since 2012, the Board's adopted level of service goal was "to develop water supplies designed to meet at least 100 percent of average annual water demand identified in the District's Urban Water Management Plan during non-drought years and at least 90 percent of average annual water demand in drought years."

As part of the current Master Plan update, staff reviewed this level of service with stakeholders and the Board. Based on those discussions, as well as an internal analysis, staff recommended the following changes:

1. Reference the Master Plan demand projection rather than the Urban Water Management Plan projection because it is closer to historic trends and will be reviewed and updated annually as part of Master Plan monitoring.
2. Update the level of service goal to meeting 80 percent of demands in drought years because it strikes a balance between minimizing shortages and the costs associated with the higher level of service.

Further considerations included the fact that the community was able to reduce water use as much as 28 percent in 2015, indicating that shortages in the range of 20 percent are manageable. Additionally, the recommendation for reducing the level of service to meeting 80 percent of demands in droughts is consistent with the following:

- Telephone Survey of Santa Clara County Voters re: Water Conservation
- Stakeholder Input
- Incremental Benefit:Costs - The incremental costs of increasing the level of service from meeting 80 percent of demands in drought years to meeting 90 percent of demands in drought years exceed the value of benefits achieved by the increase.
- Frequency of Shortage - Modeling indicates that most scenarios that achieve the recommended level of service goal have shortages in less than 10 percent of years. By comparison, the District has called for mandatory water use reductions in about 30 percent of the last 30 years.
- Planning for Uncertainty - The water supply planning model evaluates water supply conditions under a variety of scenarios, but it cannot anticipate every potential scenario, and there is inherent uncertainty in projections.

In January 2019, the Board adopted the revised level of service goal "to develop water supplies designed to meet at least 100 percent of average annual water demand identified in the District's Water Supply Master Plan during non-drought years and at least 80 percent of average annual water demand in drought years."

Additional Water Supplies Needs

The Master Plan evaluates the baseline water supply system against projected water demands through the year 2040. The baseline water supply system includes current water supplies and

existing infrastructure. Baseline water supplies include natural groundwater recharge, local runoff, recycled water, imported water through the Central Valley Project (CVP) and the State Water Project (SWP), and imported water delivered by the San Francisco Public Utilities Commission (SFPUC). Existing infrastructure includes 10 dams, 17 miles of canals, four water supply diversion dams, 393 acres of recharge ponds, 91 miles of controlled in-stream recharge, 142 miles of pipelines, three drinking water treatment plants, one advanced water purification center, and three pump stations. The Master Plan assumes Valley Water will implement the dam seismic retrofits to remove operating restrictions, complete the Rinconada Water Treatment Plan reliability improvement project, implement the 10-year pipeline rehabilitation, complete the Vasona pumping plant upgrade, and increase water conservation savings to approximately 100,000 AFY by 2030. It also assumes that countywide non-potable recycled water use will increase to about 33,000 AFY by 2040.

The amount of total water supply varies greatly from year to year, based primarily on precipitation levels. In years where water supplies exceed water demands, Valley Water is able to store surplus water in local groundwater basins, the Semitropic Water Bank, or local and statewide surface water reservoirs for later use. In dry years, Valley Water draws on these reserves to meet local water demands.

Water demands are projected to increase from about 360,000 acre-feet per year (AFY) in 2020 to about 400,000 AFY in 2040. Average baseline water supplies in 2040 are projected to be about 368,000 AFY, resulting in a small shortfall of about 32,000 AFY between average demands and average baseline supplies. However, the projected shortfall during drought is more significant. Without new investments, reserves would be depleted during extended droughts, and short-term water use reductions of up to 50 percent would be needed to avoid land subsidence and undesirable groundwater conditions. Valley Water develops the Master Plan specifically for this reason: to identify and evaluate projects to fill gaps between supplies and demands, and to recommend a strategy for long-term water supply reliability.

Master Plan Methodology, Risk, and Recommended Projects

The purpose of the Master Plan is to present Valley Water's strategy and investments for ensuring a reliable, clean water supply to meet future demands. The methodology to determine those necessary investments includes identifying the water supply reliability goal (i.e., level of service), evaluating the current and future water supply and demand trends, identifying the water supply gap, and investigating potential projects to fill those gaps. Staff identified over 40 projects that could fill that gap between supplies and demands; evaluation included analyzing their water supply yield and their associated life-cycle costs. However, no individual project can address the county's future water supply needs; therefore, various combinations of projects were evaluated for their ability to meet Valley Water's reliability goal under various scenarios.

Next, staff performed a risk ranking of the Master Plan projects under consideration to assess their ability to provide the estimated water supply benefits on schedule and budget. The four different risk categories are stakeholder, implementation, operations, and cost. Stakeholder risks include public perception, regulatory restrictions, and partnerships. Implementation risks include construction complexity and phasing potential. Operation risks include climate change and uncertainty in long-term operations and maintenance. Cost risks include stranded assets and financing security. The

risk ranking report in Attachment 2 has more detailed information on the risk categories, the risk ranking methodology, and the results. Based on direction from the Board on November 20, 2018, staff performed an update to the risk analysis of the projects under consideration. This risk analysis considered the probabilities and consequences of projects not achieving their projected water supply yields by 2040. The results were similar to the results reported in the 2017 Risk Ranking Report. The notable difference was that the risk ranking for storage projects are lower than the 2017 result, going from a high risk to medium risk, due to increased certainty in funding (i.e., Proposition 1 funding) and additional information on project benefits.

Project	Average Annual Yield (AFY)	Valley Water Lifecycle Costs[2]	Unit Cost (AF)	Risk
Delta Conveyance Project	41,000	$630 million	$600	High/Extreme
Additional Conservation & Stormwater Projects	11,000	$100 million	$400	Medium
Potable Reuse	19,000	$1.2 billion	$2,000	Medium
Pacheco Reservoir Expansion[1]	6,000	$340 million[3]	$2,000	Medium
Transfer-Bethany Pipeline[1]	3,500	$78 million	$700	Medium
South County Recharge	2,000	$20 million	$400	Medium

The amount of project yield and benefit that is usable by Valley Water depends on the portfolio of water supply projects that Valley Water ultimately implements and the outcome of ongoing regulatory processes.
[1] Assumes Prop. 1 Water Storage Investment Program funding. Costs would roughly double without funding.
[2] Valley Water lifecycle costs are presented in 2018 present value dollars.
[3] Assumes Prop. 1 and WIIN funding, WIFIA loan, and partner agencies pay 20% of the project.

The suggested Master Plan projects (Delta Conveyance Project (SWP and CVP), 24,000 AFY of potable reuse, a package of additional water conservation and stormwater capture projects, South County Recharge, Transfer-Bethany Pipeline, and Pacheco Reservoir Expansion) exceed Valley Water's newly-adopted level of service goal. However, it is unlikely that all the projects will be implemented as currently planned and be able to deliver their assumed benefits by year 2040, the planning horizon for this Master Plan. For that reason, as well as the uncertainties of demand projections and climate change, staff has developed a Monitoring and Assessment Plan, as discussed below.

Master Plan Monitoring and Assessment Plan

A primary purpose of the Master Plan is to inform investment decisions. Therefore, a critical piece of the water supply plan is a process to monitor and report to the Board on the demands, supplies, and status of projects and programs in the Master Plan. The Board can then use this information in the annual water rate setting, Capital Improvement Plan (CIP), and budget processes, which typically begin in September of each year. Monitoring will identify where adjustments to the Master Plan might be needed to respond to changed conditions. Such adjustments could include accelerating and delaying projects due to changes in the demand trend, updating projects due to implementation challenges, adding projects due to lower than expected supply trends, etc. The monitoring and

assessment plan approach for the Master Plan includes the following steps:

1. Develop an implementation schedule (Attachment 3).
2. Manage unknowns and risks through regular monitoring and assessment.
3. Report to the Board on Master Plan implementation on at least an annual basis, usually in summer.
4. Adjust projects as necessary and recommend for Board approval.

Next Steps

Over the next few months, staff is scheduled to present the draft Master Plan to Board Advisory Committees, Board Committees, and conduct two workshops - one with water retailers and government agencies, and one with other interested stakeholders. Staff plans to present a final Master Plan to the Board in September 2019, with the first annual report being presented to the Board in Summer 2020. Any changes would then be incorporated into the FY 21 CIP, budget, and water rates setting processes.

ATTACHMENTS:
Attachment 1: Staff Presentation
Attachment 2: Risk Ranking Report
Attachment 3: Draft Implementation Schedule

UNCLASSIFIED MANAGER:
Jerry De La Piedra, 408-630-2257

This Page Intentionally Left Blank

Valley Water

Clean Water • Healthy Environment • Flood Protection

Water Supply Master Plan

Presented by: Metra Richert, Unit Manager
Water Supply Planning & Conservation

Valley Water

Overview

- Master Plan Purpose
- Water Supply Strategy
- Water Supply Reliability Level of Service
- Master Plan Projects
- Monitoring and Assessment Approach
- Next Steps

Valley Water

Master Plan Purpose

- Comprehensive evaluation of project and program costs, benefits, and risks
- Recommend investment strategy
- Recommend level of service goal
- Recommend projects to ensure water reliability
- Monitor and assess to avoid overinvestments

Water Supply Strategy "Ensure Sustainability"

- Protects existing assets
- Leverage past investments
- Meets new demands with drought-resilient supplies
- Develops local and regional supplies to reduce reliance on the Delta
- Increase flexibility
- Increase resiliency to climate change

1. Secure existing supplies and infrastructure

2. Expand conservation and reuse

3. Optimize the system

valleywater.org

Water Supply Reliability Level of Service

Develop water supplies designed to meet 100 percent of demands identified in the ~~Urban Water Management Plan~~ Water Supply Master Plan in non-drought years and at least ~~90~~ 80 percent of average annual water demand in drought years.

Rationale

- 2017 Telephone Survey
- Stakeholder Input
- Incremental Costs
- Frequency of Shortage
- Planning for Uncertainty
- Conservation efforts

Master Plan Projects

- Sustainability
- Climate Change
- Operational Flexibility
- Cost
- Yield
- Rate Impacts
- Local vs. Regional Supply
- Regulatory Restrictions
- Environmental Impacts
- And more…

Valley Water

Master Plan Projects

- Baseline Projects[1]
- Delta Conveyance Project
- Additional Conservation & Stormwater Projects
- Potable Reuse (Phase 1- 24,000 AF by FY28)
- Pacheco Reservoir Expansion
- Transfer-Bethany Pipeline
- South County Recharge

[1] Dam seismic retrofits, Rinconada Water Treatment Plan reliability improvement project, 10-year pipeline rehabilitation program, Vasona pumping plan upgrade, 100,000 AFY water conservation savings, and assumes 33,000 AFY of countywide non-potable recycled water.

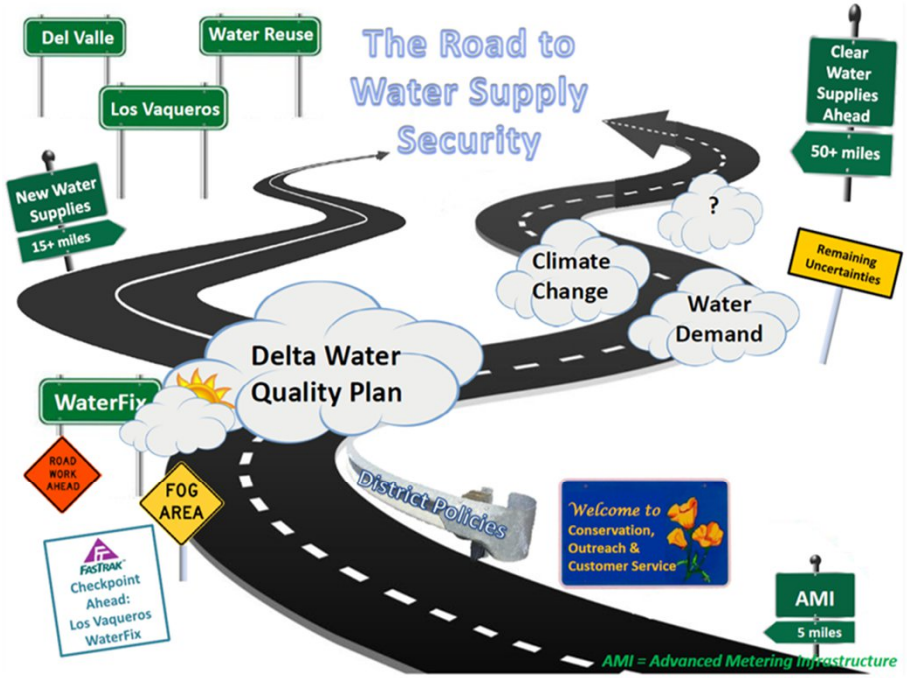
Project	Average Annual Yield (AFY)	Valley Water Lifecycle Cost[3]	Unit Cost (AF)	Risk
Delta Conveyance Project	41,000	$630 million	$600	High/ Extreme
Additional Conservation & Stormwater Projects	11,000	$100 million	$400	Medium
Potable Reuse	19,000	$1.2 billion	$2,000	Medium
Pacheco Reservoir Expansion[2]	6,000	$340 million[4]	$2,000	Medium
Transfer-Bethany Pipeline[2]	3,500	$78 million	$700	Medium
South County Recharge	2,000	$20 million	$400	Medium

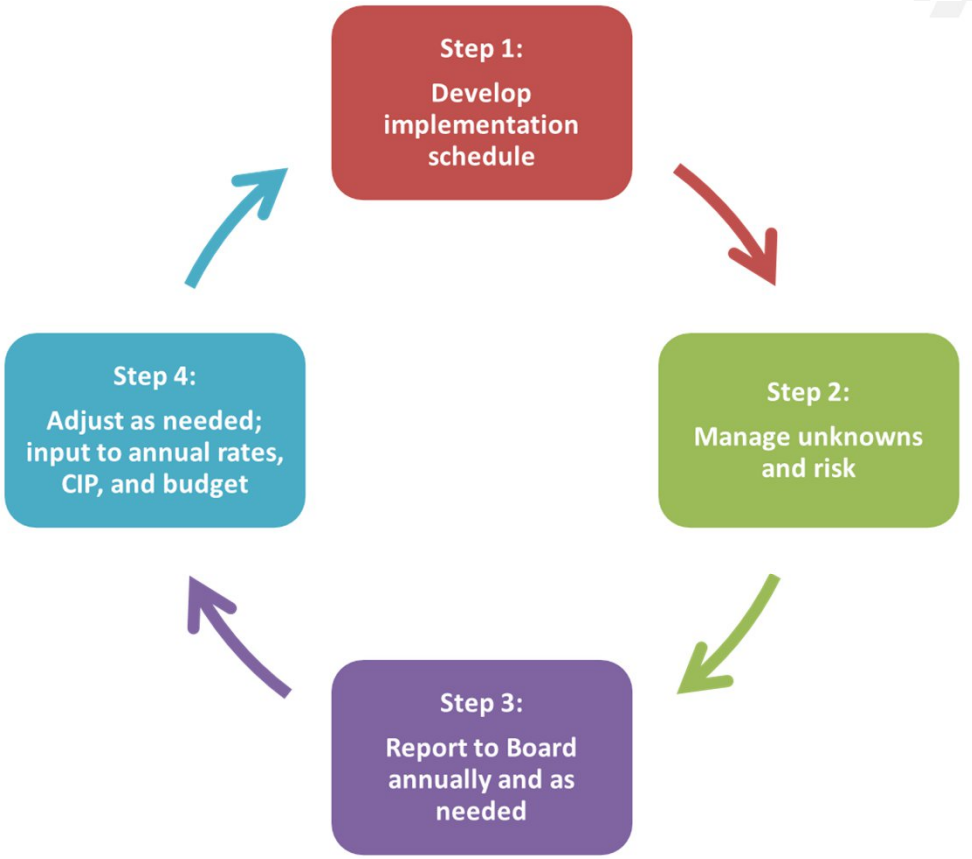
The amount of project yield and benefit that is usable by Valley Water depends on the portfolio of water supply projects that Valley Water ultimately implements and the outcome of ongoing regulatory processes.
[2] Assumes Prop. 1 Water Storage Investment Program funding. Costs would roughly double without funding.
[3] Valley Water lifecycle costs are presented in 2018 present value dollars.
[4] Assumes Prop. 1 and WIIN funding, WIFIA loan, and partner agencies pay 20% of the project.

Valley Water

valleywater.org

Monitoring and Assessment Plan





valleywater.org

Valley Water

Next Steps

- Stakeholder outreach
  - Board Advisory Committees
  - Board Committees
  - Water retailers and government agencies
  - 2 stakeholder outreach meetings
- Present final Master Plan to Board in September 2019

QUESTIONS

This Page Intentionally Left Blank

WATER SUPPLY MASTER PLAN 2017 – PROJECT RISKS

9/8/2017

Results of Pairwise and Traditional Risk Analyses

Contents

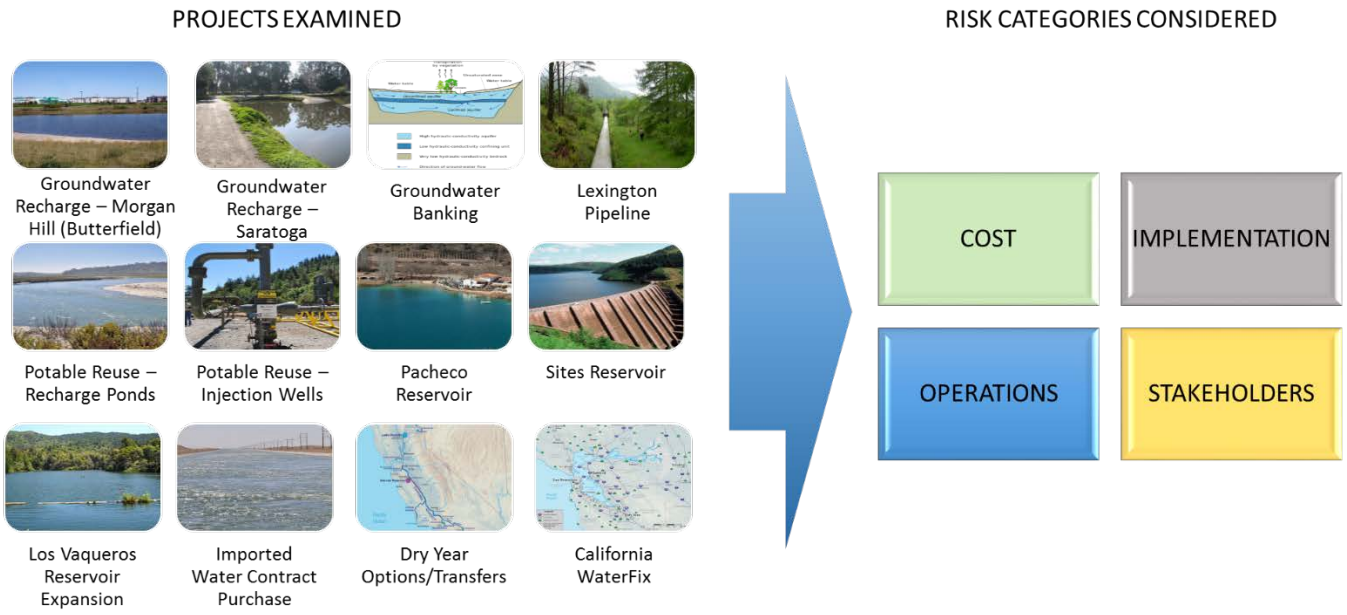
Appendices

OVERVIEW

Santa Clara Valley Water District (District) staff conducted a risk analysis of the projects being considered for inclusion in the 2017 Water Supply Master Plan (WSMP; Figure 1). The WSMP is the District's strategy for providing a reliable and sustainable water supply in a cost-effective manner. The WSMP process includes assessing the existing water supply system, estimating future supplies and demands, identifying and evaluating projects to fill gaps between supplies and demands, and recommending a strategy for long-term water supply reliability. This risk analysis helps evaluate the types, severity, and likelihood of risk associated with each WSMP project so that the District Board of Directors and community better understand the uncertainties associated with each project's ability to meet future water demands.

This report summarizes the results of the risk analysis developed to quantitatively assess the types and level of risk impacting each project. Project descriptions and cost estimates are in Appendix A - Project Descriptions. Appendix B details the methodology used to conduct the risk analysis.

FIGURE 1. PROJECTS AND RISK CATEGORIES – PROJECTS BEING CONSIDERED FOR THE 2017 WSMP AND THE TYPES OF RISK INCLUDED IN THE RISK ANALYSIS.



RISK CATEGORIES

During an Expert Panel meeting on June 8, 2017, staff and panel experts discussed different types of project risks. Afterwards, staff grouped the risks into four risk categories: Cost, Implementation, Operations, and Stakeholders. The types (or elements) of risk are summarized in Table 1 by risk category. At four meetings, one for each risk category, District subject matter experts discussed risk elements within the risk category and then conducted pairwise and traditional risk analyses of the 2017 WSMP projects. Many risks spanned the categories, but the aspects of the risk were distinct in each meeting. For example, the capital costs risk was considered during the Cost and Stakeholders risk meetings, but the Costs meeting considered the uncertainty of the capital cost estimates for each project while the Stakeholders meeting considered whether higher capital costs could result in greater stakeholder opposition. Table 1 summarizes the risks by risk category.

TABLE 1. RISK ELEMENTS BY CATEGORY. SUBJECT MATTER EXPERTS IN EACH RISK CATEGORY MET TO ASSESS PROJECT RISK WITH CONSIDERATION OF THE RISK ELEMENTS WITHIN EACH RISK CATEGORY. SEPARATE MEETINGS WERE HELD FOR EACH RISK CATEGORY.

Risk Category	Risk Elements
Costs	• Capital costs, including quality of cost estimate • Costs of regulatory compliance • Match requirements and cost-sharing • Counter-party risk/ability of partners to pay costs • Stakeholders and rate payer ability to pay • Financing and funding security • Scheduling issues • Economic fluctuations and instability • Potential for stranded assets
Implementation	• Phasing potential • Project duration and schedule • Reoperation requirements • Land availability • Constructability (e.g., structural issues, technology) • Managerial capacity (knowledge and resource availability) • Range of implementation options • Regulatory requirements • Project planning maturity
Operations	• Climate change • Yield variability and reliability • Operating Partnerships • Uncertainty of long-term operations and maintenance costs • Project inter-dependency • Environmental and water quality regulations • Control • Appropriate infrastructure • Redundancy • Emergency operations/asset failures
Stakeholders	• Public support • Permitting risks • Media • Internal stakeholder concerns • External stakeholder opposition • Environmental/special interest groups • Partnership risks • Government stakeholders • Costs

PAIRWISE RISK ANALYSIS

A pairwise risk analysis provides a quantitative approach for ranking projects by risk. Having projects ranked by riskiness improves the District Board's and community's ability to compare projects' ability to meet future needs. To complete the risk assessment, the project team assembled five to six subject matter experts from the District into four groups, one group for each risk category. The team chose District experts that had knowledge specific to their assigned risk category. Then, the subject matter experts compared each project against another project using the pairwise matrix in Table 2. The crossed-out boxes represent duplicate comparisons or compare the project against itself. The subject matter experts each determined which of the two projects being compared was a higher risk for the risk category. For example, the first comparison is Morgan Hill (Butterfield) Recharge and Groundwater Banking. If someone determined that Groundwater Banking has more risk, they would enter a "G" for Groundwater Banking

PAIRWISE RISK ANALYSIS BY RISK ELEMENT

Tables 3a-d provide the results of the pairings by risk category. Each project is represented by an abbreviation and the numbers indicate how many people chose it as the higher risk. For example, all six participants assessing cost risks thought that Imported Water Contract Purchase was higher risk than Morgan Hill (Butterfield) Recharge, so the associated cell is filled with "I6." Alternatively, two of the six participants thought Imported Water Rights Purchase (I) was higher risk than Groundwater Banking (G), so the associated cell is filled with "I2 G4."

TABLE 2. PAIRWISE COMPARISON MATRIX. EACH SUBJECT MATTER EXPERT COMPLETED THE PAIRWISE ANALYSIS BY ENTERING THE LETTER ASSOCIATED WITH THE HIGHER RISK PROJECT IN EACH EMPTY CELL.

* Morgan Hill (Butterfield) Recharge Pond

	Dry Year Options/ Transfers **D**	Lexington Pipeline **LX**	Ground-water Recharge-Saratoga **SP**	Ground-water Recharge - Morgan Hill* **B**	Ground-water Banking **G**	Sites Reservoir **S**	Los Vaqueros Reservoir Expansion **L**	Potable Reuse – Los Gatos Ponds **PL**	Potable Reuse – Ford Pond **PF**	Potable Reuse – Injection Wells **PI**	Imported Water Contract Purchase **I**	Pacheco Reservoir **PR**	California Water Fix **C**
Dry Year Options/ Transfers **D**	X												
Lexington Pipeline **LX**	X	X											
Groundwater Recharge-Saratoga **SP**	X	X	X										
Groundwater Recharge - Morgan Hill* **B**	X	X	X	X									
Groundwater Banking **G**	X	X	X	X	X								
Sites Reservoir **S**	X	X	X	X	X	X							
Los Vaqueros Reservoir Expansion **L**	X	X	X	X	X	X	X						
Potable Reuse – Los Gatos Ponds **PL**	X	X	X	X	X	X	X	X					
Potable Reuse – Ford Pond **PF**	X	X	X	X	X	X	X	X	X				
Potable Reuse – Injection Wells **PI**	X	X	X	X	X	X	X	X	X	X			
Imported Water Contract Purchase **I**	X	X	X	X	X	X	X	X	X	X	X		
Pacheco Reservoir **P**	X	X	X	X	X	X	X	X	X	X	X	X	
California WaterFix **C**	X	X	X	X	X	X	X	X	X	X	X	X	X

TABLE 3A-D. PAIRWISE COMPARISON RESULTS. THE TABULATED RESULTS FOR THE COST (A), IMPLEMENTATION (B), OPERATION (C), AND STAKEHOLDER (D) PAIRWISE ANALYSIS. EACH LETTER PRESENTS A PROJECT AS SHOWN IN THE HEADER ROW AND COLUMN. THE NUMBER FOLLOWING THE LETTERS IN EACH CELL REPRESENTS THE NUMBER OF EXPERTS WHO THINK THE ASSOCIATED PROJECT IS RISKIER.

a.

COST RISKS	Dry Year Options/ Transfers **D**	Lexington Pipeline **LX**	Ground-water Recharge Saratoga **SP**	Ground-water Recharge - Morgan Hill* **B**	Ground-water Banking **G**	Sites Reservoir **S**	Los Vaqueros Reservoir Expansion **L**	Potable Reuse – Los Gatos Ponds **PL**	Potable Reuse – Ford Pond **PF**	Potable Reuse – Injection Wells **PI**	Imported Water Contract Purchase **I**	Pacheco Reservoir **PR**	California WaterFix **C**
Dry Year Options/ Transfers **D**	X	D2 LX2	D2 SP2	D2 B2	D2 G2	D0 S4	D0 L4	D1 PL3	D1 PF3	D1 PI3	D2 I2	D0 PR4	D0 C4
Lexington Pipeline **LX**	X	X	LX3 SP1	LX4 B0	LX1 G3	LX0 S4	LX0 L4	LX0 PL4	LX0 PF4	LX0 PI4	LX2 I2	LX0 PR4	LX0 C4
Groundwater Recharge-Saratoga **SP**	X	X	X	SP4 B0	SP1 G3	SP0 S4	SP0 L4	SP0 PL4	SP0 PF4	SP0 PI4	SP1 I3	SP0 PR4	SP0 C4
Groundwater Recharge - Morgan Hill* **B**	X	X	X	X	B0 G4	B0 S4	B0 L4	B0 PL4	BO PF4	B0 PI4	B0 I4	B0 PR4	B0 C4
Groundwater Banking **G**	X	X	X	X	X	G1 S3	G0 L4	G0 PL4	G0 PF4	G0 PI4	G1 I3	G0 PR4	G0 C4
Sites Reservoir **S**	X	X	X	X	X	X	S3 L1	S3 PL1	S3 PF1	S3 PI1	S3 I1	S0 PR4	S0 C4
Los Vaqueros Reservoir Expansion **L**	X	X	X	X	X	X	X	L3 PL1	L3 PF1	L3 PI1	L2 I2	L0 PR4	L0 C4
Potable Reuse – Los Gatos Ponds **PL**	X	X	X	X	X	X	X	X	PL1 PF3	PL0 PI4	PL2 I2	PL0 PR4	PL0 C4
Potable Reuse – Ford Pond **PF**	X	X	X	X	X	X	X	X	X	PF0 PI4	PF2 I2	PF0 PR4	PF0 C4
Potable Reuse – Injection Wells **PI**	X	X	X	X	X	X	X	X	X	X	PI2 I2	PI0 PR4	PI0 C4
Imported Water Contract Purchase **I**	X	X	X	X	X	X	X	X	X	X	X	I0 PR4	I0 C4
Pacheco Reservoir **P**	X	X	X	X	X	X	X	X	X	X	X	X	PR1 C3
California WaterFix **C**	X	X	X	X	X	X	X	X	X	X	X	X	X

* Morgan Hill (Butterfield) Recharge Pond

b.

IMPLEMENTATION RISKS	Dry Year Options/ Transfers **D**	Lexington Pipeline **LX**	Groundwater Recharge-Saratoga **SP**	Groundwater Recharge - Morgan Hill* **B**	Groundwater Banking **G**	Sites Reservoir **S**	Los Vaqueros Reservoir Expansion **L**	Potable Reuse – Los Gatos Ponds **PL**	Potable Reuse – Ford Pond **PF**	Potable Reuse – Injection Wells **PI**	Imported Water Contract Purchase **I**	Pacheco Reservoir **PR**	California WaterFix **C**
Dry Year Options/ Transfers **D**	X	D1 LX3	D2 SP2	D3 B1	D4 G0	D0 S4	D0 L4	D1 PL3	D0 PF4	D0 PI4	D4 I0	D0 PR4	D0 C4
Lexington Pipeline **LX**	X	X	LX3 SP1	LX3 B1	LX3 G1	LX1 S3	LX1 L3	LX1 PL3	LX1 PF3	LX1 PI3	LX3 I1	LX0 PR4	LX0 C4
Groundwater Recharge-Saratoga **SP**	X	X	X	SP3 B1	SP2 G2	SP2 S2	SP1 L3	SP1 PL3	SP0 PL4	SP0 PI4	SP3 I1	SP0 PR4	SP0 C4
Groundwater Recharge - Morgan Hill* **B**	X	X	X	X	B3 G1	B0 S4	B0 L4	B0 PL4	B0 PF4	B0 PI4	B3 I1	B0 PR4	B0 C4
Groundwater Banking **G**	X	X	X	X	X	G0 S4	G0 L4	G0 PL4	G0 PI4	G0 PI4	G3 I1	G0 PR4	B0 C4
Sites Reservoir **S**	X	X	X	X	X	X	S3 L1	S4 PL0	S3 PF1	S4 PI0	S4 I0	S0 PR4	S0 C4
Los Vaqueros Reservoir Expansion **L**	X	X	X	X	X	X	X	L3 PL1	L2 PF2	L3 PI1	L4 I0	L1 PR3	L0 C4
Potable Reuse – Los Gatos Ponds **PL**	X	X	X	X	X	X	X	X	PL3 PF1	PL0 PI4	PL4 I0	PL0 PR4	PL0 C4
Potable Reuse – Ford Pond **PF**	X	X	X	X	X	X	X	X	X	PF1 PI3	PF4 I0	PF0 PR4	PF0 C4
Potable Reuse – Injection Wells **PI**	X	X	X	X	X	X	X	X	X	X	PI2 I2	PI0 PR4	PI0 C4
Imported Water Contract Purchase **I**	X	X	X	X	X	X	X	X	X	X	X	I0 PR4	I0 C4
Pacheco Reservoir **P**	X	X	X	X	X	X	X	X	X	X	X	X	PR0 C4
California WaterFix C	X	X	X	X	X	X	X	X	X	X	X	X	X

* Morgan Hill (Butterfield) Recharge Pond

c.

OPERATION RISKS	Dry Year Options/ Transfers **D**	Lexington Pipeline **LX**	Ground-water Recharge-Saratoga **SP**	Ground-water Recharge - Morgan Hill* **B**	Ground-water Banking **G**	Sites Reservoir **S**	Los Vaqueros Reservoir Expansion **L**	Potable Reuse – Los Gatos Ponds **PL**	Potable Reuse – Ford Pond **PF**	Potable Reuse – Injection Wells **PI**	Imported Water Contract Purchase **I**	Pacheco Reservoir **PR**	California Water Fix **C**
Dry Year Options/ Transfers **D**	X	D3 LX2	D4 SP1	D4 B1	D3 G2	D0 S5	D2 L3	D3 PL2	D3 PF2	D2 PI3	D4 I1	D1 PR4	D0 C4
Lexington Pipeline **LX**	X	X	LX5 SP0	LX5 B0	LX0 G5	LX0 S5	LX0 L5	LX0 PL5	LX0 PF5	LX0 PI5	LX2 I3	LX0 PR5	LX0 C5
Groundwater Recharge-Saratoga **SP**	X	X	X	SP1 B4	SP0 G5	SP0 S5	SP0 L5	SP0 PL5	SP0 PF5	SP0 PI5	SP0 I5	SP0 PR5	SP0 C5
Groundwater Recharge - Morgan Hill* **B**	X	X	X	X	B0 G5	B0 S5	B0 L5	B0 PL5	B0 PF5	B0 PI5	B2 I3	B0 PR5	B0 C5
Groundwater Banking **G**	X	X	X	X	X	G0 S5	G0 L5	G3 PL2	G3 PF2	G1 PI4	G2 I3	G0 PR5	G0 C5
Sites Reservoir **S**	X	X	X	X	X	X	S5 L0	S5 PL0	S5 PF0	S4 PI1	S5 I0	S4 PR1	S0 C5
Los Vaqueros Reservoir Expansion **L**	X	X	X	X	X	X	X	L5 PL0	L5 PF0	L4 PI1	L5 I0	L5 PR0	L0 C4
Potable Reuse – Los Gatos Ponds **PL**	X	X	X	X	X	X	X	X	PL3 PF2	PL1 PI4	PL3 I2	PL0 PR5	PL0 C5
Potable Reuse – Ford Pond **PF**	X	X	X	X	X	X	X	X	X	PF0 PI5	PF3 I2	PF0 PR5	PR0 C5
Potable Reuse – Injection Wells **PI**	X	X	X	X	X	X	X	X	X	X	PI4 I1	PI0 PR5	PI0 C5
Imported Water Contract Purchase **I**	X	X	X	X	X	X	X	X	X	X	X	I0 PR5	I0 C5
Pacheco Reservoir **P**	X	X	X	X	X	X	X	X	X	X	X	X	PR0 C5
California WaterFix **C**	X	X	X	X	X	X	X	X	X	X	X	X	X

* Morgan Hill (Butterfield) Recharge Pond

d.

STAKE-HOLDER RISKS	Dry Year Options/ Transfers **D**	Lexington Pipeline **LX**	Ground-water Recharge-Saratoga **SP**	Ground-water Recharge - Morgan Hill* **B**	Ground-water Banking **G**	Sites Reservoir **S**	Los Vaqueros Reservoir Expansion **L**	Potable Reuse – Los Gatos Ponds **PL**	Potable Reuse – Ford Pond **PF**	Potable Reuse – Injection Wells **PI**	Imported Water Contract Purchase **I**	Pacheco Reservoir **PR**	California WaterFix **C**
Dry Year Options/ Transfers **D**	X	D1 LX2	D1 SP2	D1 B2	D1 G2	D1 S2	D1 L2	D1 PL2	D1 PF2	D1 PI2	D2 I1	D0 PR3	D0 C3
Lexington Pipeline **LX**	X	X	LX2 SP1	LX3 B0	LX1 G2	LX0 S3	LX0 L3	LX1 PL2	LX1 PF2	LX1 PI2	LX1 I2	LX0 PR3	LX0 C3
Groundwater Recharge-Saratoga **SP**	X	X	X	SP3 B0	SP1 G2	SP0 S3	SP0 L3	SP0 PL3	SP0 PF3	SP0 PI3	SPI I2	SP0 PR3	SP0 C3
Groundwater Recharge - Morgan Hill* **B**	X	X	X	X	B1 G2	B0 S3	BO L3	B0 PL3	B0 PF3	B0 PI3	B2 I1	B0 PR3	B0 C3
Groundwater Banking **G**	X	X	X	X	X	G1 S2	G1 L2	G1 PL2	G1 PF2	G1 PI2	G2 I1	G0 PR3	G0 C3
Sites Reservoir **S**	X	X	X	X	X	S3 S0	S2 L1	S2 PL1	S2 PF1	S2 PI1	S2 I1	S0 PR3	S0 C3
Los Vaqueros Reservoir Expansion **L**	X	X	X	X	X	X	X	L1 PL2	L1 PF2	L1 PI2	L2 I1	L0 PR3	L0 C3
Potable Reuse – Los Gatos Ponds **PL**	X	X	X	X	X	X	X	X	PL1 PF2	PL0 PI3	PL2 I1	PI0 PR3	PL0 C3
Potable Reuse – Ford Pond **PF**	X	X	X	X	X	X	X	X	X	PF0 PI3	PF2 I1	PF0 PR3	PF0 C3
Potable Reuse – Injection Wells **PI**	X	X	X	X	X	X	X	X	X	X	PI2 I1	PI0 PR3	PI0 C3
Imported Water Contract Purchase **I**	X	X	X	X	X	X	X	X	X	X	X	I0 PR3	I0 C3
Pacheco Reservoir **P**	X	X	X	X	X	X	X	X	X	X	X	X	PR0 C3
California WaterFix C	X	X	X	X	X	X	X	X	X	X	X	X	X

* Morgan Hill (Butterfield) Recharge Pond

PAIRWISE RANKING RESULTS

Table 4 shows the pairwise ranking results. The letter designation represents the riskier project based on the results of the four subject matter expert groups combined. The percentage indicates the amount of agreement between the four groups. 100% indicates that all four risk groups agree the project was riskier. Where 75 percent is indicated, three of four teams ranked it higher risk (where 75%* is noted, the result was three of four, and one tie). Where 66% is indicated, two of three groups agreed and a tie in the fourth group. Finally, 50 percent indicates an even split between the four risk categories. Most the comparisons had agreement among the four categories.

TABLE 4. PAIRWISE RANKING RESULTS

ALL RISK CATEGORIES	Dry Year Options/ Transfers **D**	Lexington Pipeline **LX**	Ground-water Recharge-Saratoga **SP**	Ground-water Recharge - Morgan Hill* **B**	Ground-water Banking **G**	Sites Reservoir **S**	Los Vaqueros Reservoir Expansion **L**	Potable Reuse – Los Gatos Ponds **PL**	Potable Reuse – Ford Pond **PF**	Potable Reuse – Injection Wells **PI**	Imported Water Contract Purchase **I**	Pacheco Reservoir **PR**	California WaterFix **C**
Dry Year Options/ Transfers **D**	X	LX 66%	D/SP 50%	D/B 50%	D 66%	S 100%	L 100%	PL 75%	PF 75%	PI 100%	D 75%	PR 100%	C 100%
Lexington Pipeline **LX**	X	X	LX 100%	LX 100%	G 75%	S 100%	L 100%	PL 100%	PF 100%	PI 100%	I 66%	PR 100%	C 100%
Groundwater Recharge-Saratoga **SP**	X	X	X	SP 75%*	G 75%*	S 75%*	L 100%	PL 100%	PF 100%	PI 100%	I 75%	PR 100%	C 100%
Groundwater Recharge - Morgan Hill* **B**	X	X	X	X	G 75%	S 100%	L 100%	PL 100%	PF 100%	PI 100%	B/I 50%	PR 100%	C 100%
Groundwater Banking **G**	X	X	X	X	X	S 100%	L 100%	PL 75%	PF 75%	PI 100%	G/I 50%	PR 100%	C 100%
Sites Reservoir **S**	X	X	X	X	X	X	S 100%	S 100%	S 100%	S 100%	S 100%	PR 75%	C 100%
Los Vaqueros Reservoir Expansion **L**	X	X	X	X	X	X	X	L 75%	L/PF 50%	L 75%	L 75%*	PR 100%	C 100%
Potable Reuse – Los Gatos Ponds **PL**	X	X	X	X	X	X	X	X	PL/PF 50%	PI 100%	PL 75%*	PR 100%	C 100%
Potable Reuse – Ford Pond **PF**	X	X	X	X	X	X	X	X	X	PI 100%	PF 75%*	PR 100%	C 100%
Potable Reuse – Injection Wells **PI**	X	X	X	X	X	X	X	X	X	X	PI 50%	PR 100%	C 100%
Imported Water Contract Purchase **I**	X	X	X	X	X	X	X	X	X	X	X	PR 100%	C 100%
Pacheco Reservoir **P**	X	X	X	X	X	X	X	X	X	X	X	X	C 100%
California WaterFix **C**	X	X	X	X	X	X	X	X	X	X	X	X	X

* Morgan Hill (Butterfield) Recharge Pond

From the pairwise analysis results, California WaterFix is the riskiest project being considered, followed by the surface water reservoirs and potable reuse using injection wells. The two potable reuse projects using recharge ponds are tied, as are groundwater banking and the Lexington Pipeline. The least risky projects are the groundwater recharge projects.

TABLE 5. PAIRWISE COMPARISON RISK RANKING. Project pairwise rank determined using the count of comparisons for which each project was determined as the riskiest. The total votes by experts lists the sum of the raw scores for each project.

PAIRWISE TOTALS	PAIRWISE RANK	TOTAL VOTES BY EXPERTS
California WaterFix C	13	187
Pacheco Reservoir PR	12	165
Sites Reservoir S	11	146
Los Vaqueros Reservoir Expansion L	9	130
Potable Reuse – Injection Wells PI	10	120
Potable Reuse – Ford Road PF	8	96
Potable Reuse – Los Gatos Ponds PL	8	93
Groundwater Banking G	6	62
Imported Water Contract Purchase I	3	61
Dry Year Options/Transfers D	4	58
Lexington Pipeline LX	6	58
Groundwater Recharge - Saratoga SP	2	38
Groundwater Recharge Morgan Hill (Butterfield) B	1	23

RISK SEVERITY AND LIKELIHOOD ANALYSIS

The four risk category teams also assessed the severity and likelihood of risk for each project. The goal of this risk scoring exercise is to help determine how much riskier one project is compared to another and to identify if the risk is primarily from the likelihood that the risk materializes, the severity of the outcome if the risk materializes, or both. The methodology and risk scoring criteria are included in Appendix B. Each risk category expert scored the risk severity and likelihood for each project on a scale from 1 to 4, with four (4) being the highest magnitude of risk. The definitions are summarized in Table 6. Table 7 presents the sum of the median score for each of the risk categories by project, from highest to lowest risk. The relative ranking of risk using the severity and likelihood is the same as when the pairwise results are used. Figure 2. Risk Matrix. illustrates the severity and likelihood analysis results in a risk matrix.

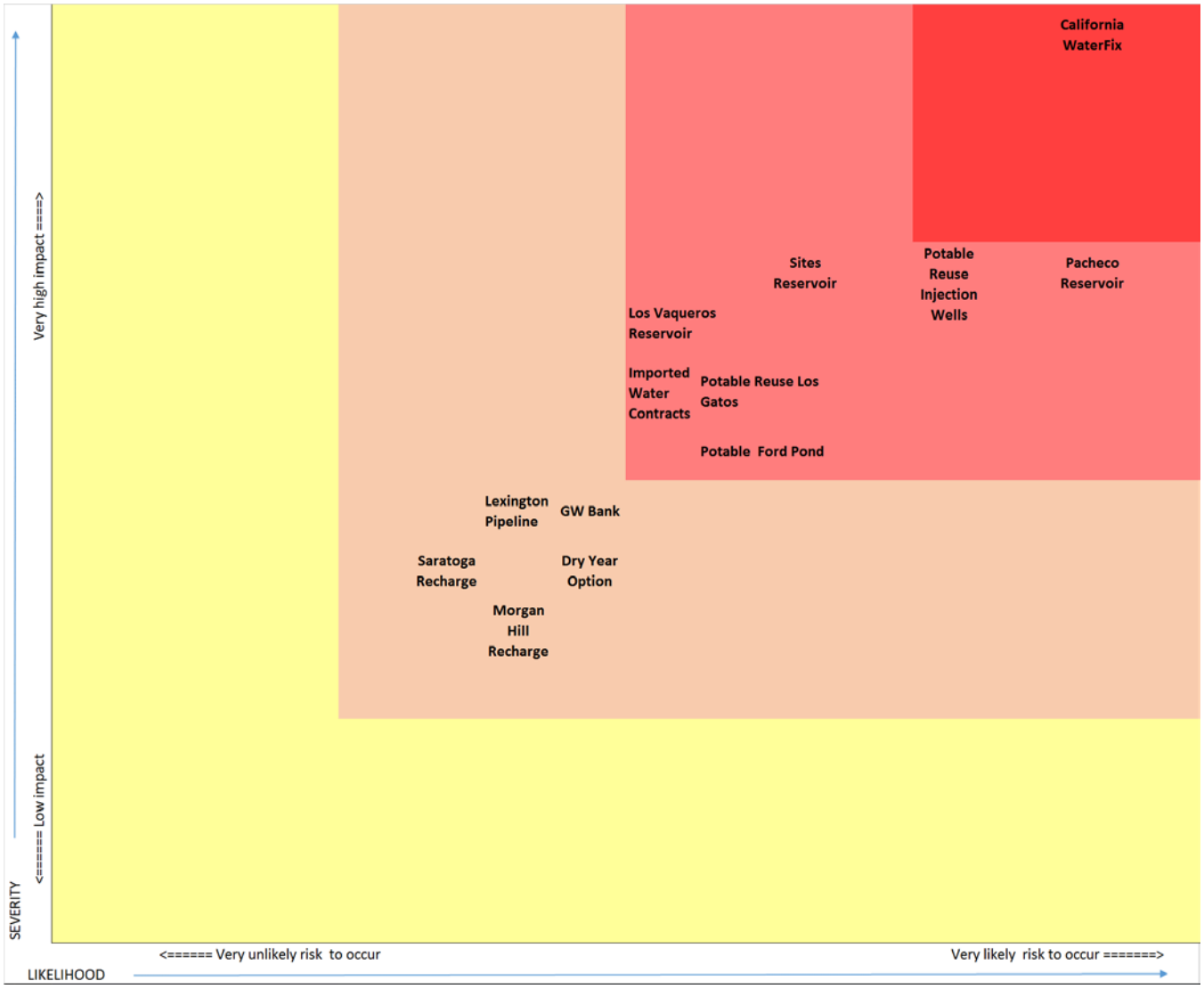
TABLE 6. RISK SEVERITY AND LIKELIHOOD DEFINITIONS

Severity	1. Low= low to no effect on project 2. Medium = minor to modest impacts 3. High = significant or substantial impacts 4. Very High = extreme potential impacts
Likelihood	1. Very Unlikely = Risks will not materialize 2. Unlikely = Risks probably will not materialize 3. Likely = Risks probably will materialize 4. Very Likely = Almost certain risks will materialize

TABLE 7. RISK SEVERITY AND LIKELIHOOD RESULTS

Project	Severity Score (Max. of 16)	Likelihood Score (Max of 16)
California WaterFix C	16	15
Pacheco Reservoir PR	12	15
Sites Reservoir S	12	11
Potable Reuse – Injection Wells PI	12	13
Los Vaqueros Reservoir Expansion L	11	9
Potable Reuse – Ford Road PF	9	10
Potable Reuse -Los Gatos Ponds PL	10	10
Groundwater Banking G	8	8
Lexington Pipeline LX	8	7
Dry year options/transfers D	7	8
Imported Water Contract Purchase I	10	9
Groundwater Recharge -Saratoga SP	7	6
Groundwater Recharge Morgan Hill (Butterfield) B	6	7

FIGURE 2. RISK MATRIX. LIKELIHOOD OF PROJECT IMPACT INCREASES UPWARD ALONG THE VERTICAL AXIS AND SEVERITY INCREASES ALONG THE HORIZONTAL AXIS. SEE TABLE 9 FOR THE RAW DATA USED TO DEVELOP THIS FIGURE.



TOTAL PROJECT RISK CALCULATION

Staff calculated the total project risk for each category by weighting the pairwise ranking by the severity and likelihood (equation 1).

Equation 1

$$Risk_{category} = (1 + \frac{Severity + Likelihood}{8}) \times Pairwise\ Ranking$$

The severity and likelihood score is divided by eight (the maximum possible combined score) to represent severity and likelihood as a portion of the maximum possible combined score. This proportion is then added to one (1) so that the pairwise analysis remains the primary driver of the order of risk, and then the severity and likelihood is a multiplicative factor that acts on the risk ranking. If the severity and likelihood is significant, it will substantially increase the total risk score. If the severity and likelihood score are small, there will be little impact on the total risk score. Alternatively, not adding one (1) to the severity and likelihood proportion would result in the severity and likelihood decreasing the ranking number unless the severity and likelihood proportion equals one. Then the risk score was normalized by dividing by the maximum possible score and multiplying by 100 to convert to a percentage value. The project risks for each category are in Figures 3 through 6. The combined total project risk is in Figure 7.

FIGURE 3. WEIGHTED COST RISK

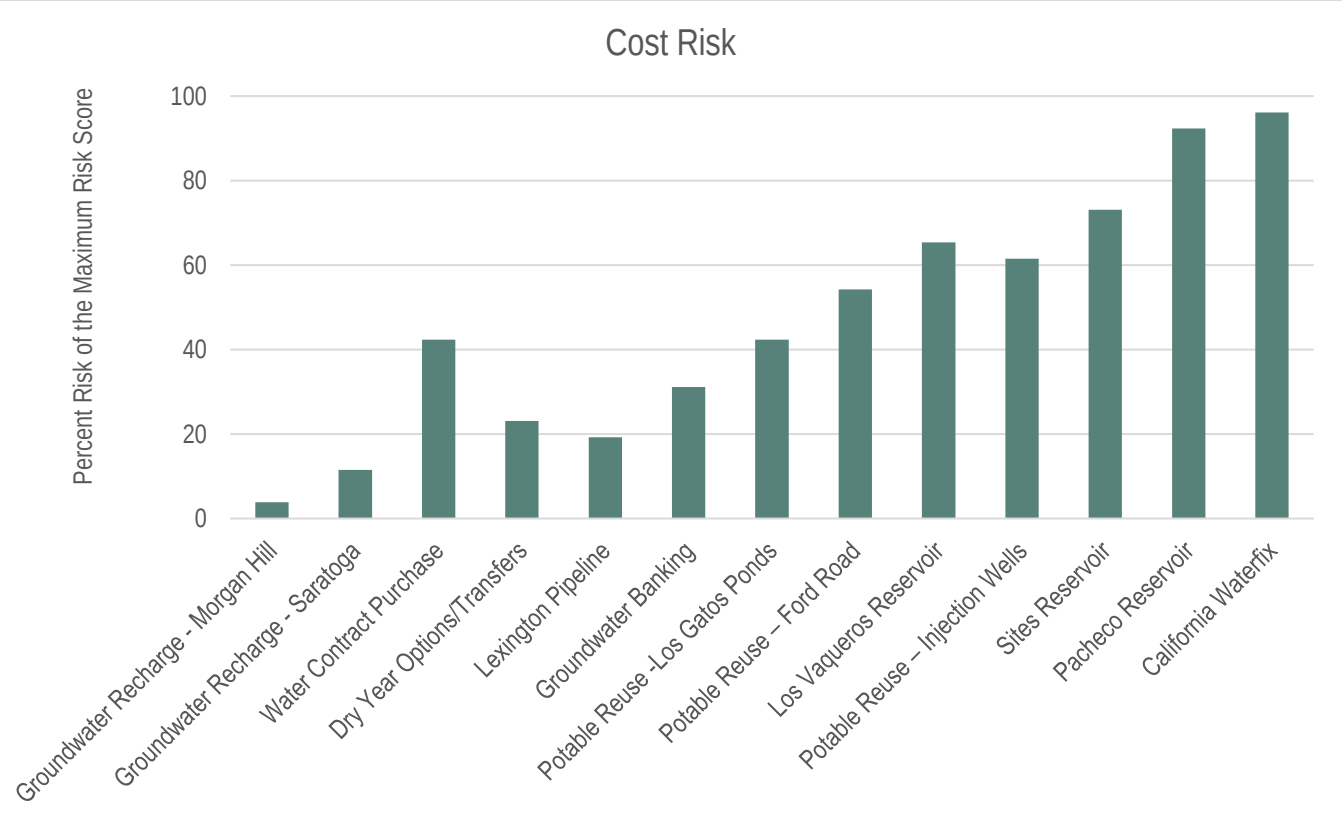


FIGURE 4. WEIGHTED IMPLEMENTATION RISK

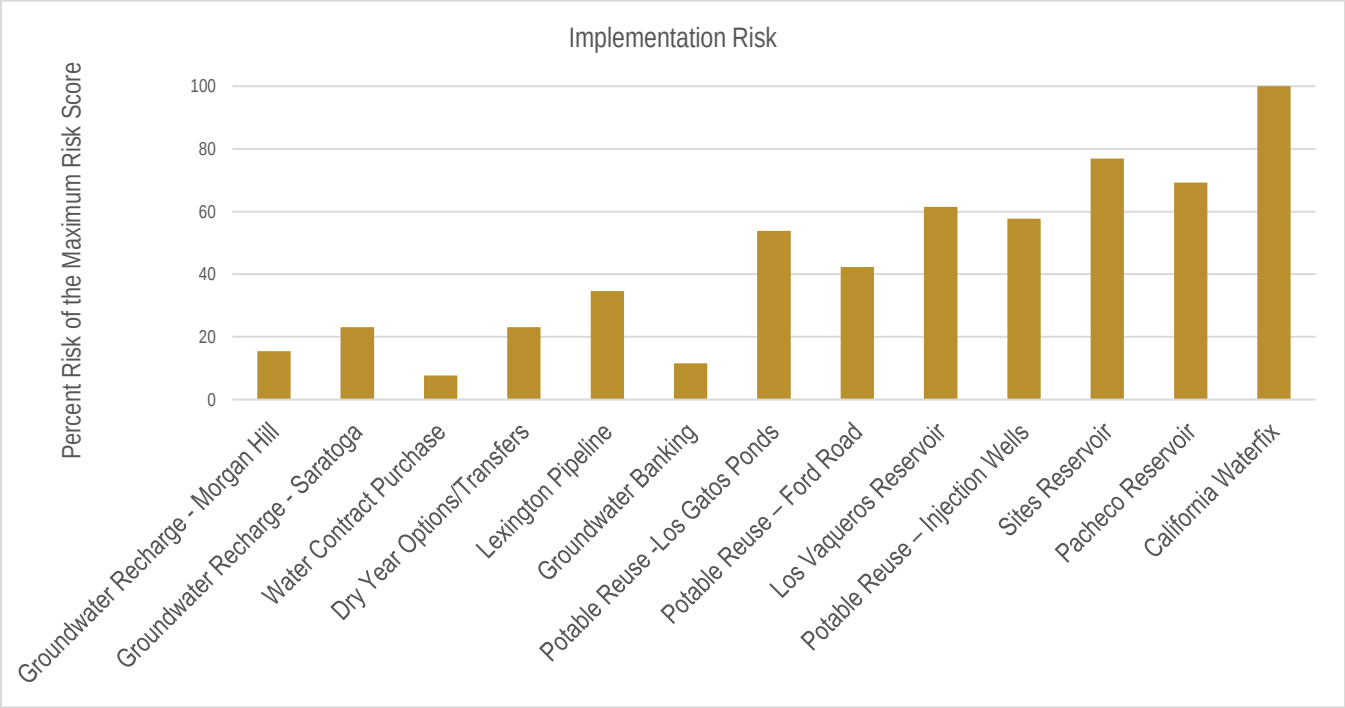


FIGURE 5. WEIGHTED OPERATIONS RISK

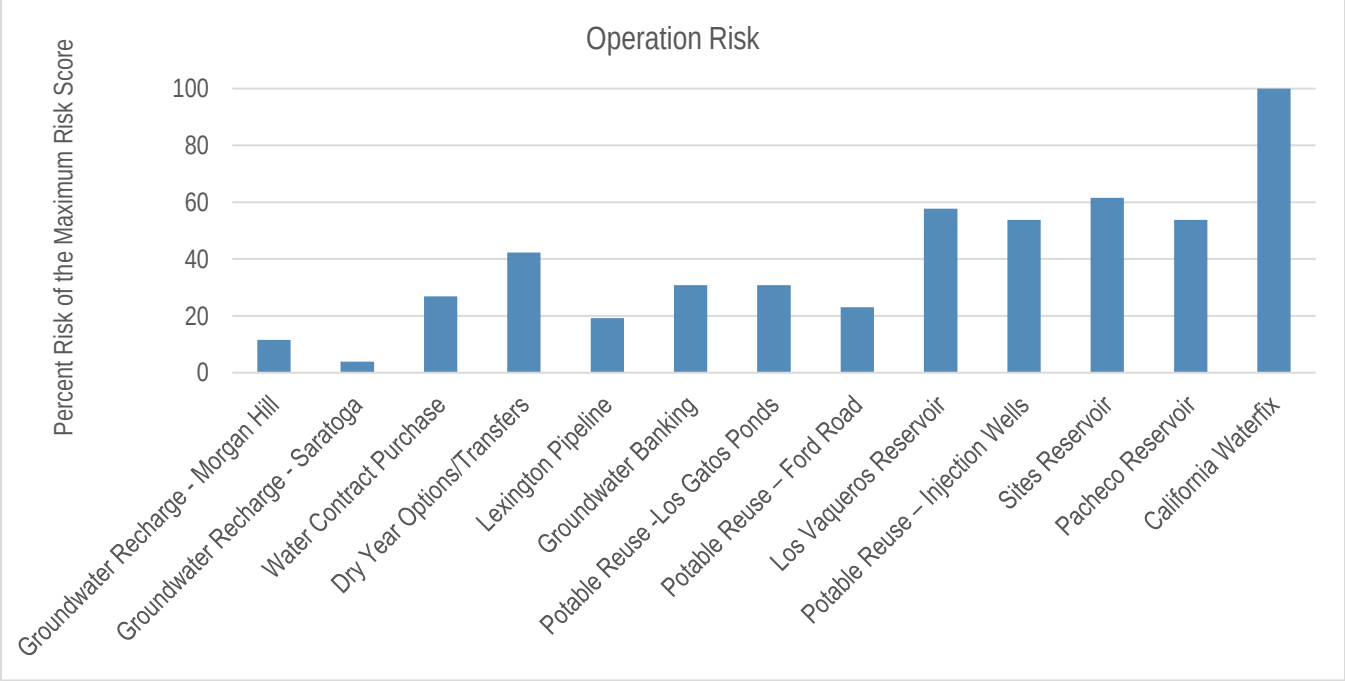


FIGURE 6. WEIGHTED STAKEHOLDER RISK

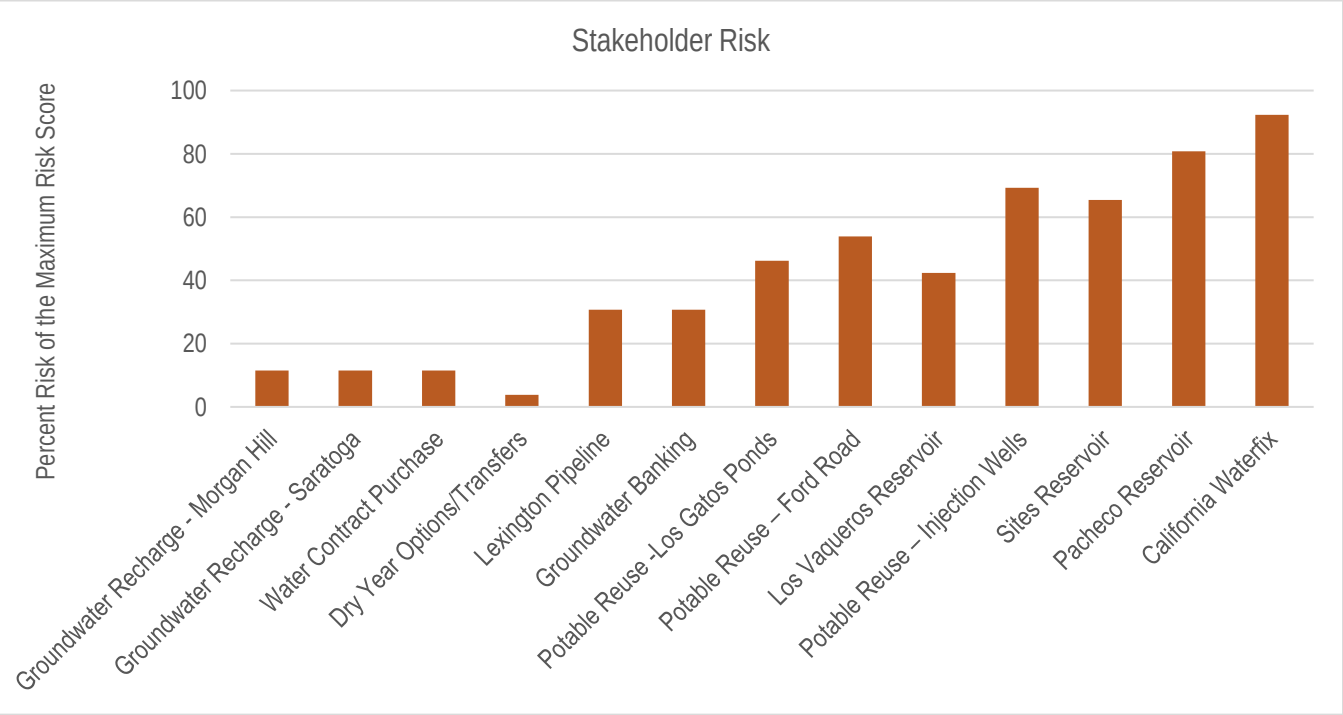
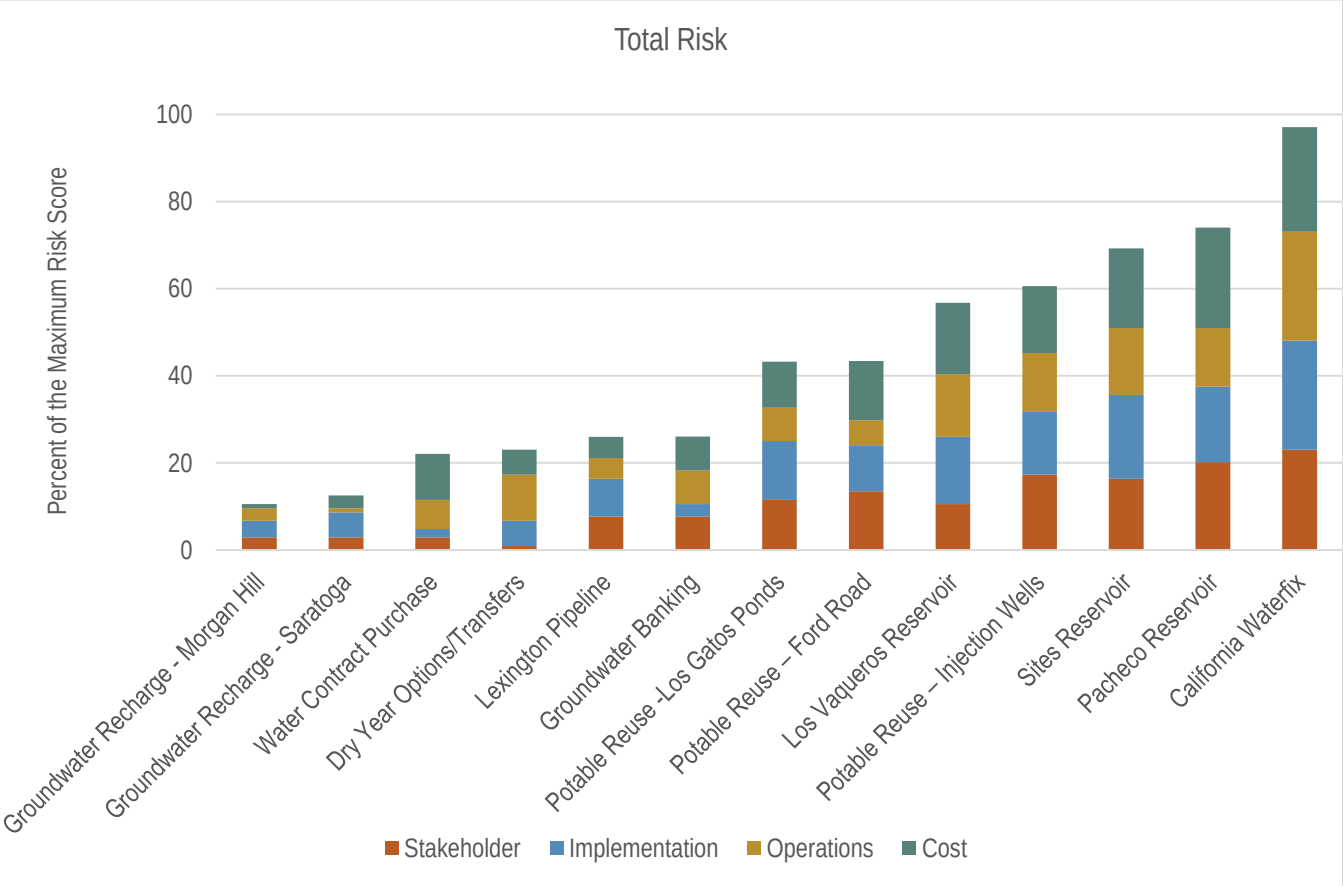


FIGURE 7. TOTAL WEIGHTED PROJECT RISK



PROJECT RISK SUMMARY AND CONCLUSIONS

California WaterFix and the three surface water reservoirs (Pacheco, Sites, and Los Vaqueros) are among the highest risk projects based on this analysis. California WaterFix and Sites Reservoir risk is distributed relatively evenly among the four categories, while Pacheco has more cost risk and Los Vaqueros has less stakeholders risk compared to the other risk categories.

Uncertainties related to future regulatory requirements for the California WaterFix may affect project operations and impact water supply yields. Although significant contingencies have been included in the cost estimates, there could be cost overruns due to the size and complexity of the construction project. Additionally, opposition from vocal stakeholders and potential legal challenges could lead to schedule delays and changes in proposed operations that impact the project's water supply benefit.

Sites Reservoir would depend on Sacramento River flows and Pacheco Reservoir would store Delta-conveyed supplies (along with local water), causing uncertainty in the amount of water that either reservoir will supply. Future environmental regulations and hydrologic changes could significantly affect the modeled yields from the reservoirs. In addition, both reservoirs will likely have significant environmental mitigation requirements that could further reduce the water supply and increase the project costs.

In contrast to Sites, California WaterFix, and Los Vaqueros, the risk analysis results suggest that the Pacheco Reservoir cost-related risk is more significant than the stakeholders, implementation, and operations risks. The cost risks are based on concerns that Pacheco partners have less financial resources and the project has less secure funding sources compared to Sites, California WaterFix, or Los Vaqueros. In addition, the cost estimate for construction and operations/maintenance could increase considerably since the project is in the early phases of planning.

The analysis shows that Los Vaqueros Reservoir has a relatively low risk compared to the other reservoir proposals and California WaterFix, with 12 percent less total risk than the next riskiest reservoir (Sites Reservoir). Risk experts from each of the risk categories commented that Los Vaqueros has been expanded before with little opposition, on time, and on budget. In addition, experts from the costs group noted that there are several potential cost-sharing partners that are financially reliable. There are potential implementation and operation complexities due to the large number of partners.

The analysis also shows that potable reuse using injection wells is riskier than potable reuse using recharge ponds. Injection wells are a relatively new technology compared to recharge ponds and recharge pond operations, maintenance, and costs are better understood. However, experts were concerned that Ford Ponds will require decommissioning several retailer wells, potentially being a stakeholder acceptance and project implementation issue. General potable reuse concerns included public acceptance, poor cost estimates for advanced purification systems, and unknown regulatory requirements. However, experts thought it is less risky than reservoirs or California WaterFix because the water will be a drought-proof, reliable, local supply and that the current socio-political environmental surrounding potable reuse as a water supply will help improve public perception.

Groundwater banking and Lexington Pipeline both had the same amount of total risk. However, compared to Lexington Pipeline, groundwater banking had higher cost and operations risks and lower implementation risks. Since the District already participates in groundwater banking with Semitropic Water Storage District (Semitropic), stakeholders are familiar banking and the associated costs risks. In addition, implementation risks and operations risks are like those with Semitropic in that there needs to be exchange capacity in dry years and the storage is not in-county. While those risks exist, they are relatively small compared to other projects

since the District has experience planning for and mitigating those risks. However, the new potential banking partners will need to build infrastructure to be able to bank District water.

In contrast to groundwater banking, most of the risk associated with Lexington Pipeline is implementation risk. The implementation concern is the ability to build the pipeline through urban areas and potentially complex geologies. Since the pipeline would be locally maintained and operated, there are less operational and cost-related risks. The main cost risk associated with Lexington Pipeline is the construction cost. In contrast, the District would not control the groundwater banking operations and costs would be a recurrent negotiation.

Imported water contract purchase and dry year transfer risks are primarily associated with cost and operation. The contract purchase option is a permanent transfer of SWP Table A contractual water supplies, which are subject to the same regulatory restrictions and delivery uncertainties as our current imported water supplies. In addition, the SWP South Bay Aqueduct has conveyance limits that could make it difficult to receive additional Table A contract water during higher allocation years. In contrast, dry year transfers can only be delivered during specific months. However, if dry year transfers are available, there is little risk that the District will not receive the purchased transfer water. Imported water contract purchase and dry year transfer are both lower risk relative to most other projects since neither require construction, reducing their implementation and cost risks. However, stakeholder experts suggested that it may have poor optics to buy more Table A water when we already do not receive 100 percent of our contract allotment and that it may be difficult to find someone interested in selling their Table A water contract. Similarly, dry year transfers may not be available for purchase when needed.

The Morgan Hill (Butterfield) recharge channel and Saratoga recharge pond were the lowest risk projects because they are less costly than other projects, are local, and the District has successfully completed similar projects. Morgan Hill (Butterfield) recharge channel is currently owned by Morgan Hill and actively used for stormwater conveyance during the winter. To use the channel for recharge as planned, the District will need to coordinate operations with Morgan Hill and extend the District's Madrone Pipeline to the channel. The chief concern with Saratoga recharge pond is identifying and purchasing a suitable property for recharge.

In general, the lowest risk projects are those that are locally controlled or similar to already completed projects. Imported water rights purchase, dry year transfer, and groundwater banking are current practices, so the District is prepared for the uncertainties associated with those projects. Similarly, Morgan Hill (Butterfield) recharge channel is similar to the Madrone recharge channel and is locally controlled. Potable reuse is the newest technology the District is considering, but the facilities are locally controlled and the District is currently testing potable reuse to confirm its operational capabilities. Experts did find potable reuse with recharge ponds to be lower risk than potable reuse with injection wells. The District has experience managing recharge ponds, consistent with the conclusion that lower risk projects are those that are most similar to existing District projects. Projects that require substantial construction and cost-sharing are higher risk, such as California WaterFix and the Pacheco, Sites, and Los Vaqueros Reservoirs.

This risk assessment helps provide the Board of Directors and external stakeholders more thorough understanding of each proposed project. Understanding project risks and how these risks may materialize can help determine which projects to invest in and what project-related issues to prepare for in the future as project development proceeds.

Appendix A: Project and Program Descriptions (as of September 2017)

Project	Pros	Cons	Average Annual Yield (AFY)[1]	Present Value Cost to District (2017)	Cost/AF
California WaterFix: Constructs two 40-foot diameter tunnels at least 100 feet below ground surface capable of diverting up to 9,000 cubic feet-per-second from the Sacramento River and delivering it to the federal and state pumps. Alternative to conveying water all Central Valley Project and State Water Project supplies through the Delta. Would require environmental flow and water quality criteria be met.	• Secures existing Delta-conveyed supplies • Upgrades aging infrastructure • Protects the environment through less impactful diversions • Improves reliability of other Delta-conveyed supplies and transfers • Protects water quality	• Implementation complexity • Long-term operational uncertainty • Stakeholder opposition • Financing uncertainty	41,000	$620 million	$600
Dry Year Options / Transfers: Provides 12,000 AF of State Water Project transfer water during critical dry years. Amount can be increased or decreased. Can also include long-term option agreements.	• Provides supply in critical years when needs are greatest • Allows for phasing • Can implement in larger increments • Complements all other projects	• Subject to Delta-restrictions • Increases reliance on Delta • Cost volatility • Uncertainty with willing sellers	2,000	$100 million	$1,400

[1] The average annual yield of many projects depends on which projects they are combined and the scenario being analyzed. For example, groundwater banking yields is higher in portfolios that include wet year supplies. Similarly, they would be lower in scenarios where demands exceed supplies and excess water is unavailable for banking.

Project	Pros	Cons	Average Annual Yield (AFY)[1]	Present Value Cost to District (2017)	Cost/AF
Groundwater Banking: Provides 120,000 AF of banking capacity for Central Valley Project and State Water Project contract water. Sends excess water to a groundwater bank south of the Delta during wet years and times of surplus for use during dry years and times of need. Annual put and take capacities of 30,000 AFY. Project more effective in portfolios that include new supplies.	• Significantly reduces drought shortages when paired with projects with all-year supply • Allows for phasing	• Subject to Delta restrictions • Uncertainty with Sustainable Groundwater Management Act implementation	2,000	$170 million	$3,900
Groundwater Recharge – Morgan Hill Recharge: Extends the Madrone Pipeline from Madrone Channel to Morgan Hill's Butterfield Channel and Pond near Main Street. Would need to be operated in conjunction with the City's stormwater operations.	• Optimizes the use of existing supplies • Conjunctive use strategy • Helps drought recovery • Local project	• Minimal impact on drought shortages • North County locations limited • Potential siting conflicts with existing land uses	2,000	$20 million	$400
Groundwater Recharge – Saratoga: Constructs a new groundwater recharge facility in the West Valley, near the Stevens Creek pipeline.			1,000	$50 million	$1,300

Project	Pros	Cons	Average Annual Yield (AFY)[1]	Present Value Cost to District (2017)	Cost/AF
Lexington Pipeline: Constructs a pipeline between Lexington Reservoir and the raw water system to provide greater flexibility in using local water supplies. The pipeline would allow surface water from Lexington Reservoir to be put to beneficial use elsewhere in the county, especially when combined with the Los Gatos Ponds Potable Reuse project which would utilize the capacity of the Los Gatos recharge ponds where most water from Lexington Reservoir is currently sent. In addition, the pipeline will enable the District to capture some wet-weather flows that would otherwise flow to the Bay.	• Optimizes the use of existing local supplies • Increases local flexibility • Complements potable reuse	• Water quality issues will require pre-treatment/management • Minimal reduction in drought shortages	3,000	$90 million	$1,000

Project	Pros	Cons	Average Annual Yield (AFY)[1]	Present Value Cost to District (2017)	Cost/AF
Los Vaqueros Reservoir: Secures an agreement with Contra Costa Water District and other partners to expand the off-stream reservoir by 110,000 AF (from 160 TAF to 275 TAF) and construct a new pipeline (Transfer-Bethany) connecting the reservoir to the South Bay Aqueduct. Assumes District's share is 35,000 AF of storage, which is used to prorate costs. Emergency storage pool of 20,000 AF for use during droughts. District would also receive Delta surplus supplies when there is capacity to take. Average yield for District about 3,000 AFY. Assumes sales of excess District supplies to others. Transfer-Bethany Pipeline provides about ¾ of the project benefits at ¼ of the cost.	• Provides drought supplies • Improved transfer/exchange capacity • Allows for phasing (Transfer-Bethany Pipeline provides significant benefit) • Complements projects with all-year supply • Supports regional reliability • Public and agency support	• Operational complexity • Institutional complexity	3,000	$40 million	$400
Pacheco Reservoir: Enlarges Pacheco Reservoir to 140,000 AF. Assumes local inflows and ability to store Central Valley Project supplies in the reservoir. Construction in collaboration with Pacheco Pass Water District and San Benito County Water District. Potential other partners.	• Locally controlled • Addresses San Luis Reservoir Low-Point problem • Provides flood protection • Provides cold water for fisheries • Increases operational flexibility	• Impacts to cultural resources • Long-term operational uncertainty • Increases long-term environmental commitments • May require use of Delta-conveyed supplies to meet environmental commitments • Stakeholder opposition	6,000	$450 million	$2,700

Project	Pros	Cons	Average Annual Yield (AFY)[1]	Present Value Cost to District (2017)	Cost/AF
Potable Reuse – Ford Pond: Constructs potable reuse facilities for 5,000 AFY of groundwater recharge capacity at/near Ford Ponds.	• Local supply • Not subject to short or long term climate variability • Allows for phasing	• Reverse osmosis concentrate management for injections wells and Los Gatos Ponds projects • Uncertainty with agreements with San Jose • Injection well operations complex • Potential public perception concerns	3,000	$190 million	$2,500
Potable Reuse – Injection Wells: Constructs (or expands in conjunction with the Los Gatos Ponds project) potable reuse facilities for 5,000 to 15,000 AFY of groundwater injection capacity.			5,000 – 15,000	$290 million - $860 million	$2,000
Potable Reuse -Los Gatos Ponds: Constructs facility to purify water treated at wastewater treatment plants for groundwater recharge. Potable reuse water is a high-quality, local drought-proof supply that is resistant to climate change impacts. Assumes 24,000 AFY of advanced treated recycled water would be available for groundwater recharge at existing recharge ponds in the Los Gatos Recharge System.			19,000	$990 million	$1,700

Project	Pros	Cons	Average Annual Yield (AFY)[1]	Present Value Cost to District (2017)	Cost/AF
Sites Reservoir: Establishes an agreement with the Sites JPA to build an off-stream reservoir (up to 1.8 MAF) north of the Delta that would collect flood flows from the Sacramento River and release them to meet water supply and environmental objectives. Assumes District's share is 24,000 AF of storage, which is used to prorate yields from the project. The project would be operated in conjunction with the SWP and CVP. In some years, District would receive less Delta-conveyed supply with the project than without the project.	• Off-stream reservoir • Improves operational flexibility of Statewide water system	• Increases reliance on the Delta • Subject to Delta risks • Long-term operational uncertainty • Operational complexity • Institutional complexity	8,000	$170 million	$800
Water Contract Purchase: Purchase 20,000 AF of SWP Table A contract supply from other SWP agencies.	• Provides all year supply	• Increases reliance on the Delta • Subject to Delta risks • Willing sellers' availability	12,000	$360 million	$800

APPENDIX B. WSMP 2017 PROJECT RISK ANALYSIS METHODOLOGY

CONTENTS

The following staff participating in the risk analysis:

Aaron Baker
Afshin Rouhani
Charlene Sun
Cris Tulloch
Dana Jacobson
Darin Taylor
Debra Butler
Debra Caldon
Erin Baker
Jerry De La Piedra
Jose Villarreal
Karen Uyeda
Lei Hong
Luisa Sangines
Marty Grimes
Paul Randhawa
Samantha Green
Tracy Hemmeter
Vanessa De La Piedra

BACKGROUND:

At the expert panel meeting on June 8, 2017, a panel member suggested that the Water Supply Planning team conduct a risk assessment on the projects being considered as part of the WSMP. A participant at the expert panel meeting suggested using a Paired Comparison Analysis. The WSMP project team and expert panel brainstormed elements of project risk, which the technical team then used to create risk categories that encompassed the risk elements. After the meeting, the project team identified internal subject matter experts for each risk category to participate in the paired comparison risk assessment. The project team then decided to combine the paired comparison risk analysis with a traditional risk ranking (severity and likelihood) to better understand the relative magnitude of each risk. This provides a detailed explanation of the methodology employed. The results and conclusions are presented in the September 8, 2017, *WSMP 2017 – PROJECT RISKS: Results of Pairwise and Traditional Risk Analyses.*

RISK CATEGORIES

The WSMP project team reviewed the risk elements brainstormed during the expert panel meeting and grouped them into four risk categories: stakeholder, implementation, operations, and cost (Table 1). The risk categories reflect the different stages of a project where risk can occur. Each project requires approval or support from a diverse set of stakeholders, ranging from the public to the Board of Directors. This may be needed only at the beginning of a project, or throughout as is the case with regulatory approval. Once a project is supported by stakeholders, the project enters the planning/implementation phase. Implementation risks capture risks that occur during planning, design, permitting, and construction. The cost risk category encompasses elements of uncertainty associated with the initial cost estimates through the uncertainty associated with recurring operations and maintenance costs during the project's lifespan. Once the project is implemented, issues associated with project operations will need to be addressed throughout the lifespan of the project. An example of a potential recurring operations issue is the need to re-operate as environmental regulations or climate changes.

Once the project team determined the risk categories, they reviewed risk management references to ensure they were presenting a comprehensive assessment of risk. During the literature review, the technical team found a risk category structure named POET that is analogous to their risk categorization (TRW, Inc.). POET categories include political, operational, economic, and technical, and is used to assess challenges and opportunities associated with programs, customer challenges, and strategies, regardless of the size and complexity.

- Political: Assess and articulate associated leadership, mission/business decision drivers, organizational strengths/weaknesses, policies, governance, expectation management (e.g., stakeholder relationship), program management approach, etc.
- Operational: Obtain and evaluate mission capabilities, requirements management, operational utility, operational constraints, supporting infrastructure and processes, interoperability, supportability, etc.
- Economic: Review capital planning and investment management capabilities, and assess the maturity level of the associated processes of budgeting, cost analysis, program structure, acquisition, etc.
- Technical: Assess and determine the adequacy of planned scope/scale, technical maturity/obsolescence, policy/standards implementation, technical approach, etc.

The risk categories determined by the project team have slightly different names than the POET categories, but they cover very similar content.

Table 1: Risk Category and Risk Elements.

Risk Category	Risks
Costs	• Capital costs, including quality of cost estimate • Costs of regulatory compliance • Match requirements and cost-sharing • Counter-party risk • Stakeholders and rate payer perspective and ability to pay • Financing and funding security • Scheduling issues • Economic fluctuations and instability • Stranded assets
Implementation	• Phasing potential • Required time table • Reoperation requirements • Land availability • Constructability (e.g., structural issues, technology) • Managerial capacity (knowledge and resource availability) • Range of implementation options • Regulatory requirements • Project planning maturity
Operations	• Climate change • Yield variability and reliability • Operating Partnerships • Uncertainty of long-term operations and maintenance costs • Project inter-dependency • Environmental and water quality regulations • Control • Appropriate infrastructure • Redundancy • Emergency operations/asset failures
Stakeholders	• Public support • Permitting risks • Media • Internal stakeholder concerns • External stakeholder opposition • Environmental/special interest groups • Partnership risks • Government stakeholders • Costs

After a review of risk assessment methodologies, the project team determined that while a pairwise comparison provides the relative risk ranking of projects, it does not indicate how much riskier one project is in comparison to one of lower rank. To quantify the magnitude of risk, the project team decided to add an evaluation of risk severity and likelihood.

To complete the risk assessment, the project team assembled five to six subject matter experts from the District into four groups, one group for each risk category. The team chose District experts that had knowledge specific to their assigned risk category (Table 1). At each of the four risk assessment meetings, the following agenda was followed:

1) Projects were discussed to the experts could understand the projects sufficiently to perform their analysis.
2) District experts reviewed and brainstormed additional elements of risk associated with the category.
3) District experts independently completed a pairwise comparison.
4) A meeting facilitator tallied the pairwise comparisons during the meeting and the District experts discussed some of the project comparisons where experts had disagreements.
5) District experts independently completed the risk magnitude assessment, which was tallied afterwards.

After this assessment was completed, the project team added four additional projects to the list. This required the analysis to be conducted again with the added projects. The same process was followed for the second analysis, with the following exceptions:

- A subset of the same staff was used in the second analysis, with four to five experts per category.
- The subject matter experts did not meet in person for the second analysis, so there was not the same level of discussion or ability to ask questions about projects as during the first analysis.

PAIRED COMPARISON

The subject matter experts received a matrix of the projects where they could complete their paired comparisons (Table 2A). Each expert compared one project to another and identified which project between the two is of greater risk for the risk category being evaluated. The project team then tabulated the results during the meeting for the first phase (Table 2B- All results), and the experts discussed some of the project comparisons where there was not consensus. Given time constraints, not all paired comparisons with disagreements could be discussed; instead, the project team selected the most significant disagreements for discussion. For the second phase, the experts were provided the same information and forms, and they completed the assessments on their own.

Table 2A: Pairwise Template

OPERATIONS Risk	Butterfield Recharge Pond **B**	Groundwater Banking South of Delta **G**	Sites Reservoir **S**	Los Vaqueros Reservoir Expansion **L**	Potable Reuse – Ford Road **PF**	Potable Reuse – Injection Wells **PI**	Imported Water Rights Purchase **I**	Pacheco Reservoir **PR**	California Waterfix **C**
Butterfield Recharge Pond **B**	X								
Groundwater Banking South of Delta **G**	X	X							
Sites Reservoir **S**	X	X	X						
Los Vaqueros Reservoir Expansion **L**	X	X	X	X					
Potable Reuse – Ford Road **PF**	X	X	X	X	X				
Potable Reuse – Injection Wells **PI**	X	X	X	X	X	X			
Imported Water Rights Purchase **I**	X	X	X	X	X	X	X		
Pacheco Reservoir **P**	X	X	X	X	X	X	X	X	
California Waterfix **C**	X	X	X	X	X	X	X	X	X

Table 2B: Pairwise Results

	Butterfield Recharge Pond **B**	Groundwater Banking South of Delta **G**	Sites Reservoir **S**	Los Vaqueros Reservoir Expansion **L**	Potable Reuse – Ford Road **PF**	Potable Reuse – Injection Wells **PI**	Imported Water Rights Purchase **I**	Pacheco Reservoir **PR**	California Waterfix **C**
Butterfield Recharge Pond **B**	X	G5	S5	L5	PF5	PI5	I4 B1	PR5	C5
Groundwater Banking South of Delta **G**	X	X	S5	L3 G2	PF3 G2	PI2 G3	I2 G3	PR5	C5
Sites Reservoir **S**	X	X	X	S5	S5	PI1 S4	S5	PR5	C5
Los Vaqueros Reservoir Expansion **L**	X	X	X	X	PF1 L4	PI1 L4	I1 L4	PR5	C5
Potable Reuse – Ford Road **PF**	X	X	X	X	X	PI5	I3 PF2	PR5	C5
Potable Reuse – Injection Wells **PI**	X	X	X	X	X	X	I3 PI2	PR5	C5
Imported Water Rights Purchase **I**	X	X	X	X	X	X	X	PR5	C5
Pacheco Reservoir **P**	X	X	X	X	X	X	X	X	C4 PR1
California Waterfix **C**	X	X	X	X	X	X	X	X	X

RISK SCORING METHODOLOGY

Following the pairwise comparison, the experts scored the risk severity and likelihood for individual projects (Table 3). The goal of this risk scoring exercise is to help determine how much riskier one project is from another and to identify if the risk is primarily from the likelihood that the risk materializes, the severity of the outcome if the risk

did materialize, or both. For example, it is unlikely that an earthquake would destroy a dam, but if it did, the results could be catastrophic for life and property (low likelihood, high severity). However, when completing this exercise, experts considered all the risk elements discussed during the pairwise comparison activity to determine one project risk rating for severity and one for likelihood. The ranking criteria for each risk category is explained in detail in the next section.

Table 3: Risk Scoring Template

	Severity of Implementation Risk Impact 1-4, 1 - Low Severity 4 - High severity	**Likelihood of Implementation Risk Impact 1-4, 1 - Very unlikely 4 - Very likely within timeframe**
Butterfield Recharge Pond		
Groundwater Banking South of Delta		
Sites Reservoir		
Los Vaqueros Reservoir Expansion		
Potable Reuse – Ford Road		
Potable Reuse – Injection Wells		
Imported Water Rights Purchase		
Pacheco Reservoir		
California Waterfix		

The scores from this exercise were multiplied by the ordered ranking from the pairwise analysis to determine total risk. The following section provides detailed methods for the total risk calculation.

An example of how the subject matter experts could consider risk rating was provided, but not relied upon due to the many different sub-elements of risk to consider.

EXAMPLE:

Rank the **likelihood** of a stakeholder risk adversely impacting the project

1 = Very unlikely – Support available within 5 to 10 years

2 = Unlikely – appropriate support will Probably be garnered within 5 to 10 years

3 = Likely - Probably will NOT get support within 5 to 10 years

4 = Very likely - Almost certain NOT to get needed support within 5 to 10 years

Rank the **severity** of a stakeholder risk adversely impacting the project:

1 = Low – Stakeholder support exists or lack of support will not affect project success

2 = Medium –Potential for stakeholder issues to impact project success

3 = High – Potential for stakeholder issues to significantly impact project success

4 = Very High – Likely that lack of stakeholder support would result in project failure

TOTAL PROJECT RISK CALCULATION

The project team calculated category risk for each project by weighting the pairwise ranking by the severity and likelihood (equation 1). Then, the category risks were summed to obtain each project's total risk.

Equation 1

$$Risk_{category} = (1 + \frac{Severity + Likelihood}{8}) \times Pairwise\ Ranking$$

The severity and likelihood score is divided by eight (the maximum possible combined score) to represent severity and likelihood as a portion of the maximum possible combined score. The technical team then added that proportion to one (1) so that the pairwise analysis remains the primary driver of the order of risk, and then the severity and likelihood is a multiplicative factor that acts on the risk ranking. If the severity and likelihood is significant, it will substantially increase the total risk score. If the severity and likelihood score are small, there will be little impact on the total risk score. Alternatively, not adding one (1) to the severity and likelihood proportion would result in the severity and likelihood decreasing the ranking number unless the severity and likelihood proportion equals one.

CONCLUSION

The risk assessment methods were easy to apply to the projects and provided a robust and multi-variant method assess risks associated with each project. However, explaining the methods clearly to the subject matter experts was needed. Since the second phase of review with the added project did not include discussions or the opportunity to ask questions, it may have been subject to less project understanding by the experts.

The results are discussed in September 8, 2017, *WSMP 2017 – PROJECT RISKS: Results of Pairwise and Traditional Risk Analyses.*

DRAFT MASTER PLAN IMPLEMENTATION SCHEDULE

Project	Now – 2024	2025 – 2029	2030 – 2034	2035-2039
Delta Conveyance Project	• Permitting • Design • "Validation Action"	Construction	Construction	Operation
Additional Conservation & Stormwater Projects	• Continue implementing stormwater rebates and graywater program • Design and begin implementing AMI program • Work with jurisdictions to adopt Model Ordinance • Develop Ag Land Recharge pilot project • Monitor stormwater capture projects	• Continue implementing stormwater rebates, graywater program, AMI • Support implementation of Model Ordinance • Develop leak repair incentive program • Design Ag Land Recharge and stormwater capture project(s)	• Continue implementing stormwater rebates, graywater program, AMI • Support implementation of Model Ordinance • Implement leak repair incentive program • Design and construct Ag Land Recharge and stormwater capture project(s)	• Continue implementing stormwater rebates, graywater program, AMI, leak repair incentive program, and Ag Land Recharge and stormwater capture project(s) • Support implementation of Model Ordinance • Construct stormwater capture project(s)
Potable Reuse	• Complete Countywide Reuse Plan • MOU(s) with wastewater provider (s) • Select P3 entity • EIR • Design	Construction	Operation	Operation
Pacheco Reservoir Expansion	• EIR/Feasibility Study • Permitting • Planning and Design	Construction	Operation	Operation
Transfer Bethany Pipeline	• EIR/Feasibility Study • Permitting • Planning, Design, and Construction	Operation	Operation	Operation
South County Recharge		Planning, Design, and Permitting	Construction	Operation

This Page Intentionally Left Blank

File No.: 19-0602

Agenda Date: 7/1/2019
Item No.: 5.2.

COMMITTEE AGENDA MEMORANDUM

Agricultural Water Advisory Committee

SUBJECT:
Discuss Proposed Collaborative to Identify Sources of Revenue to Subsidize Agricultural Water Rates.

RECOMMENDATION:
This is a discussion item and no action is required. However, the Committee may make recommendations on the proposed collaborative process and membership.

SUMMARY:
In response to the Board's May 14, 2019, request to bring back a recommendation about how to proceed forward in finding a way to replace the discretionary portion of the Open Space Credit subsidy through a community drive effort, the Revenue Working Group (RWG), is recommending to the Board on June 25, 2019, that they encourage a collaborative effort for the purpose of identifying and securing a permanent, and/or ongoing funding source to replace the discretionary portion of the Open Space Credit.

The Proposed Collaborative to Identify Sources of Revenue to Subsidize Agricultural Water Rates includes the following:

Collaborative Scope and Purpose: The proposed scope and purpose of the Collaborative will be to identify, investigate and secure a permanent, and/or ongoing, funding source to replace the discretionary portion of the Santa Clara Valley Water District (Valley Water) Open Space Credit which is currently being utilized to subsidize commercial agricultural water rates. This funding source shall be a new source of funding which is not part of the current Valley Water portfolio.

Suggested Collaborative Membership: Director John Varela for Valley Water, and other external entities and individuals who may be interested in replacing the Open Space Credit, including but not limited to a coalition of agricultural interests, open space organizations, other governmental organizations, and environmental groups.

Progress Report: A public update on the progress of the Collaborative shall be provided to the Board of Directors approximately one year, (July 1, 2020), prior to the expiration of the Open Space subsidy.

ATTACHMENTS:
Attachment 1: Board Agenda Memo

UNCLASSIFIED MANAGER:
Michele King, 408-630-2711

MEMORANDUM

FC 14 (02-08-19)

TO:	Santa Clara Valley Water District Board of Directors	**FROM**:	Chair Linda J. LeZotte, Vice Chair Nai Hsueh, and Director Barbara Keegan
SUBJECT:	Collaborative to Identify Sources of Revenue to Subsidize Agricultural Water Rates	**DATE**:	June 25, 2019

Last year the three of us embarked upon a path, at the then Chair's direction, to identify ways to increase revenue options and sources for Santa Clara Valley Water District (Valley Water). As you know, the Open Space Credit has been part of our ongoing discussions, and on April 23, 2019 a majority of the Board voted to remove the discretionary portion of the Open Space Credit subsidy in its entirety in two years. The removal of this discretionary portion of the Open Space Credit still leaves in place the mandatory portion of the Open Space Credit, which is required so that the agricultural water rate can be set no higher than a maximum of 25 percent of the non-agricultural rate as provided for in the Valley Water Enabling Act.

For clarification, the Open Space Credit is a funding mechanism whereby some of Valley Water's non-rate related revenues are used to subsidize commercial farming operations. Removing the discretionary portion of the Open Space Credit will allow Valley Water to use these funds to support environmental restoration or enhancement projects, projects which provide for natural flood protection, or other infrastructure efforts which benefit Santa Clara County residents.

Valley Water has long been a supporter of the agricultural community. For example, Valley Water has provided grants to improve irrigation, funded a mobile lab to improve farm irrigation efficiency, and funded numerous non-profit agricultural programs that benefit both youth and seniors in our community.

During the May 14, 2019 Board meeting, the board assigned to the revenue working group the task of bringing back a recommendation about how to proceed forward in finding a way to replace the discretionary portion of the Open Space Credit subsidy through a community driven effort.

Our proposal is to encourage a collaborative effort as suggested below:

<u>Collaborative to Identify Sources of Revenue to Subsidize Agricultural Water Rates</u>

Collaborative Scope and Purpose: The scope and purpose of the Collaborative will be to identify, investigate and secure a permanent, and/or ongoing, funding source to replace the discretionary portion of the Valley Water Open Space Credit which is currently being utilized to subsidize commercial agricultural water rates. This funding source shall be a new source of funding which is not part of the current Valley Water portfolio.

Suggested Collaborative Membership: Director John Varela for Valley Water, and other external entities and individuals who may be interested in replacing the Open Space Credit, including but not limited to a coalition of agricultural interests, open space organizations, other governmental organizations, and environmental groups.

Progress Report: A public update on the progress of the Collaborative shall be provided to the Board of Directors approximately one year, (July 1, 2020), prior to the expiration of the Open Space Credit subsidy.

_____
Chair Linda J. LeZotte, District 4

_____
Vice Chair Nai Hsueh, District 5

_____
Director Barbara Keegan, District 2

File No.: 19-0603

Agenda Date: 7/1/2019
Item No.: 5.3.

COMMITTEE AGENDA MEMORANDUM

Agricultural Water Advisory Committee

SUBJECT:
Discuss Agricultural Water Use Baseline Study.

RECOMMENDATION:
This is a discussion item and the Committee may provide comments; however, no action is required.

SUMMARY:
The Santa Clara Valley Water District (Valley Water) would like to better understand the conservation potential in the agriculture sector, including identifying how best to assist local growers in approving efficiency. To do this, Valley Water staff is proposing a baseline study of agricultural water use and practices. This memo summarizes the proposed components of a Valley Water Agriculture Water Use Baseline Study (Study), as well as possible next steps.

Background
The goal of the Study is to better understand current agricultural water use practices and identify opportunities for additional water conservation. Staff's proposal is to hire a contractor or consulting firm to develop and complete the Study. Staff will also coordinate with the local Farm Bureau and Santa Clara County staff.

Staff reviewed baseline studies completed for other sectors and developed a preliminary list of topics the Study may address:

1) Types of crops and associated acres of crops in Santa Clara County
2) Types of irrigation systems used, by crop type
3) When available, water use by crop type and by irrigation method, including potentially comparing to crops' water budgets
4) Geographical distribution of agricultural practices in Santa Clara County
5) Agricultural producers' water use knowledge and mindsets
    a. Concerns related to water supply
    b. Knowledge/mindset related to water use and water conservation
    c. Knowledge and opinions of Valley Water's conservation programs
6) Recommendation of potential projects or programs to increase agricultural water use efficiency

Staff is scheduled to present this proposal to the Board's Water Conservation and Demand Management Committee (WCaDMC) at their June 18, 2019 meeting and will provide the Agricultural

Water Advisory Committee (Committee) a verbal update summarizing WCaDMC feedback.

Next Steps
Staff will incorporate Committee and WCaDMC comments to finalize the list of topics the Study will cover and develop a Scope of Work to incorporate into a Request for Proposals. Staff will coordinate with the local Farm Bureau and Santa Clara County staff throughout the process. Staff will update the Committee as the Study progresses.

ATTACHMENTS:
None.

UNCLASSIFIED MANAGER:
Jerry De La Piedra, 408-630-2257

File No.: 19-0604

Agenda Date: 7/1/2019
Item No.: 5.4.

COMMITTEE AGENDA MEMORANDUM

Agricultural Water Advisory Committee

SUBJECT:
Review Agricultural Water Advisory Committee Work Plan, the Outcomes of Board Action of Committee Requests; and the Committee's Next Meeting Agenda.

RECOMMENDATION:
Review the Committee work plan to guide the committee's discussions regarding policy alternatives and implications for Board deliberation.

SUMMARY:
The attached 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 agendized 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 commissions 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:
Attachment 1: Agricultural Water Advisory Committee 2019 Work Plan
Attachment 2: Agricultural Water Advisory Committee October 7, 2019 Draft Agenda

UNCLASSIFIED MANAGER:
Michele King, 408-630-2711

2019 Work Plan: Agricultural Water Advisory Committee

Update: June 2019

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 BOARD POLICY	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
1	**Election of Chair and Vice Chair for 2019**	January 7	• Committee Elects Chair and Vice Chair for 2019. **(Action)**	**Accomplished January 7, 2019:** The Committee elected Mr. David Vanni as 2019 Committee Chair and Mr. Jan Garrod as 2019 Committee Vice Chair.
2	**Annual Accomplishments Report**	January 7	• Review and approve 2018 Accomplishments Report for presentation to the Board. **(Action)** • Submit requests to the Board, as appropriate.	**Accomplished January 7, 2019:** The Committee reviewed and approved the 2018 Accomplishments Report for presentation to the Board. *The Board received the Committee's presentation at its March 26, 2019, meeting.*
3	**Open Space Credit Policy**	January 7 April 8	• Review the Open Space Credit Policy. **(Action)** • Provide comment to the Board in the implementation of the District's mission as it applies to the Open Space Credit Policy.	**Accomplished January 7, 2019:** The Committee reviewed and commented to the Board on the Open Space Credit Policy with the following action: • *The Committee approved not to support staff's recommendation and would like to receive more analysis for them to make a more informed decision.* **Accomplished April 8, 2019:** The Committee reviewed and commented to the Board on the Open Space Credit Policy with the following action: The Committee approve submitting the following letter to the Board of Directors, April 8, 2019:

Yellow = Update Since Last Meeting

Blue = Action taken by the Board of Directors

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
				The AWAC opposes the proposed changes in the Open Space Credit policy at this time. Members of the AWAC currently have the understanding that: 1) Valley Water apparently at this time does not have a precise, comprehensive valuation of the benefits that agricultural lands and open space provide in Santa Clara County with respect to mitigating flood risk, 2) Valley Water apparently at this time does not have precise estimates of the effect on flood risk that would result from various levels of urbanization of agricultural lands and open space in Santa Clara County, 3) Diverting funding from the Open Space Credit for the purpose of flood control may be counterproductive, and maintaining agricultural lands and open space may be among the most cost effective means of mitigating flood risk, 4) Agricultural land that is not under Williamson Act or conservation easement is the land that is most at risk for conversion to non-agricultural use. 5) At the moment when the County of Santa Clara has just launched a comprehensive Agricultural Plan with state and county funding to sustain agriculture and retain its many important benefits, this would be an unfortunate time to raise the cost of groundwater to most agricultural producers by almost 20%, and would undermine the hoped-for trust and collaborative spirit among diverse

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
				interests that will be needed for success of the plan. 6) Headlines about the proposed reduction in Open Space Credit might well read: Valley Water hits farmers with 20% increase in water costs at time when county launches major effort to preserve threatened farming and open space and Valley Water's price hike to farmers in response to 2017 flooding may increase flood risks and costs.
4	**Review of Agricultural Water Advisory Committee Work Plan, the Outcomes of Board Action of Committee Requests and the Committee's Next Meeting Agenda**	January 7 April 8 July 1 October 7	• Receive and review the 2018 Board-approved Committee work plan**. (Action)** • Submit requests to the Board, as appropriate.	**Accomplished January 7, 2019:** The Committee reviewed the 2019 work plan and took the following action: • *The Committee agreed to add updates on: Anderson Dam, CA WaterFix and One Water Plan.* **Accomplished April 8, 2019:** The Committee reviewed the 2019 work plan and took no action.
5	**Standing Items Reports/Fiscal Year 2019:** **1. Finalize the Fisheries and Aquatic Habitat Collaboration Effort (FAHCE) (Report from the FAHCE Ad Hoc Committee)** **2. Actively Pursue Efforts to Increase Water Storage Opportunities (Report from the Water Storage Exploratory Committee)** **3. Actively Participate in Decisions Regarding the California WaterFix (Report from EWRC Board Representative)** **4. Advance Recycled and Purified Water Efforts with the City of San Jose and Other**	April 8	• Receive quarterly reports on standing items. **(Information)**	**Accomplished April 8, 2019:** The Committee received report on the new standing items reports for Fiscal 2019 and took no action.

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
	Agencies (Report from the Recycled Water Committee) **5. Advance Anderson Dam Seismic Retrofit Project (Report from the Capital Improvement Program Committee)** **6. Provide for a Watershed-Wide Regulatory Planning and Permitting Effort (Report from the Capital Improvement Program Committee)** **7. Ensure Immediate Emergency Action Plans and Flood Protection are Provided for Coyote Creek (Report from the Coyote Creek Flood Risk Reduction Ad Hoc Committee)** **8. Foster a Coordinated Approach to Environmental Stewardship Effort (Report from EWRC Board Representative)** **9. Advance Diversity and Inclusion Efforts (Report from the Diversity and Inclusion Ad Hoc Committee)**			
6	**Review and Comment to the Board on the Fiscal Year 2019 - 2020 Proposed Groundwater Production Charges.**	April 8	• Review and comment to the Board on the Fiscal Year 2020 Proposed Groundwater Production Charges. **(Action)** • Provide comments to the Board, as necessary.	**Accomplished April 8, 2019:** The Committee reviewed and commented to the Board on the Fiscal Year 2020 Proposed Groundwater Production Charges as follows: • The motion failed: 3 Ayes, 5 Nays, 3 abstained.

Yellow = Update Since Last Meeting
Blue = Action taken by the Board of Directors

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
7	**<u>Standing Items Reports Fiscal Year 2020:</u>** **1. Finalize the Fisheries and Aquatic Habitat Collaborative Effort (FAHCE). (Assigned to FAHCE)** **2. Actively Pursue Efforts to Increase Water Storage Opportunities. (Assigned to Water Storage Exploratory Committee)** **3. Actively Participate in Decisions Regarding the California Delta Conveyance. (Assigned to California Delta Conveyance Working Group)** **4. Lead Recycled and Purified Water Efforts with the City of San Jose and Other Agencies. (Assigned to Recycled Water Committee)** **5. Engage and educate the community, local elected officials and staff on future water supply strategies in Santa Clara County. (Assigned to Water Conservation and Demand Management Committee)** **6. Advance Anderson Dam Seismic Retrofit Project. (Assigned to Capital Improvement Program Committee)** **7. Provide for a Watershed-Wide Regulatory Planning and Permitting Effort. (Assigned to FAHCE)** **8. Attain net positive impact on the environment when implementing Valley Water's mission.**	July 1 October 7	• Receive quarterly reports on standing items. **(Information)**	

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
	9. Promote the protection of creeks, bay, and other aquatic ecosystems from threats of pollution and degradation (E-4.1.3). (Assigned to Homeless Encampment Ad Hoc Committee **10. Advance Diversity and Inclusion Efforts. Carry forward to FY20. (Assigned to Diversity and Inclusion Ad Hoc Committee)** **11. Understand if the level of services Valley Water provides to the public are reasonable and the costs of providing services are affordable and effective. (Assigned to Revenue Working Group)**			
8	**Water Supply Master Plan Update** *See Board Priority Standing item #5*	July 1	• Receive an update on the Water Supply Master Plan. **(Action).** • Provide comments to the Board, as necessary.	Link to 1/18/19 Board Agenda **https://scvwd.legistar.com/LegislationDetail.aspx?ID=3833245&GUID=B2A7EFC8-34C3-4EF8-BF2A-FC11774B9CF1&Options=ID|Text|Attachments|&Search=January+18%2c+2019**
10	**Discuss Proposed Collaborative to Identify Sources of Revenue to Subsidize Agricultural Water Rates**	July 1	• Discuss Proposed Collaborative to Identify Sources of Revenue to Subsidize Agricultural Water Rates **(Action)** • Provide comments to the Board, as necessary	

Yellow = Update Since Last Meeting
Blue = Action taken by the Board of Directors

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
11	**Discuss Agricultural Water Use Baseline Study**	July 1	• Discuss Agricultural Water Use Baseline Study **(Information)** • Provide comments to the Board, as necessary	
12	**One Water Plan Update** *See Board Priority Standing item #8*	October 7	• Receive information on One Water Plan. **(Information)** • Provide comments to the Board, as necessary	
13	**California Delta Conveyance (formerly CA WaterFix)**	*See Board Priority Standing item #3*	• Receive information on California Delta Conveyance. **(Information)** • Provide comments to the Board, as necessary	
14	**Update on Anderson Dam**	*See Board Priority Standing item #6*	• Receive information on Anderson Dam. **(Information)** • Provide comments to the Board, as necessary	

Yellow = Update Since Last Meeting
Blue = Action taken by the Board of Directors

ITEM	WORK PLAN ITEM BOARD POLICY	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
15	**Climate Change Mitigation – Carbon Neutrality by 2020 Program Update, Climate Change and Sea Level Rise Adaptation – Water Supply, Flood Protection, Ecosystems Protection**	Link to 1/22/19 Board Agenda	• Receive information on climate change mitigation – carbon neutrality by 2020 program update. **(Action)** • Provide comments to the Board, as necessary.	**https://scvwd.legistar.com/LegislationDetail.aspx?ID=3834299&GUID=3DE58FF2-BB43-4305-81C4-916B18DBE118&Options=&Search=**

Yellow = Update Since Last Meeting
Blue = Action taken by the Board of Directors

Committee Officers
David Vanni, Committee Chair
Jan Garrod, Committee Vice Chair

Board Representative
Nai Hsueh, Alternate
Richard P. Santos, Board Representative
John L. Varela, Board Representative

DRAFT AGENDA

AGRICULTURAL WATER ADVISORY COMMITTEE

MONDAY, OCTOBER 7, 2019

1:30 p.m. – 3:30 p.m.

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

Time Certain:
1:30 p.m. **1.** **Call to Order/Roll Call**

2. **Time Open for Public Comment on Any Item Not on Agenda**
Comments should be limited to two minutes. If the Committee wishes to discuss a subject raised by the speaker, it can request placement on a future agenda.

3. **Approval of Minutes**
3.1 Approval of Minutes – July 1, 2019, meeting

Standing Items Reports

4. *This item allows the Committee to receive verbal or written updates and discuss the Board's Fiscal Year 2020 Work Plan Strategies. These items are generally informational, however, the Committee may request additional information and/or provide collective input to the assigned Board Committee.*

1. Finalize the Fisheries and Aquatic Habitat Collaborative Effort (FAHCE) (Assigned to Water Conservation and Demand Management Committee)
2. Actively Pursue Efforts to Increase Water Storage Opportunities. (Assigned to Water Conservation and Demand Management Committee)
3. Actively Participate in Decisions Regarding the California Water Fix. (Assigned to California WaterFix Working Group)
4. Lead Recycled and Purified Water Efforts with the City of San Jose and Other Agencies. (Assigned to Recycled Water Committee)
5. Engage and educate the community, local elected officials and staff on future water supply strategies in Santa Clara County. (Assigned to Water Conservation and Demand Management Committee)
6. Advance Anderson Dam Seismic Retrofit Project. (Assigned to Capital Improvement Program Committee)
7. Pursue opportunities to expedite regulatory permit processes and streamline permit reviews. (Assigned to FAHCE Ad Hoc Committee)
8. Attain net positive impact on the environment when implementing flood protection and water supply projects. (Assigned to Capital Improvement Program Committee)

9. Promote the protection of creeks, bay, and other aquatic ecosystems from threats of pollution and degradation (E-4.1.3). (Assigned to Homeless Encampment Ad Hoc Committee)
10. Advance Diversity and Inclusion Efforts. Carry forward to FY20 (Assigned to Diversity and Inclusion Ad Hoc Committee)
11. Understand if the level of services Valley Water provides to the public are reasonable and the costs of providing services are affordable and effective. (Assigned to Revenue Working Group)

5. Action Items

5.1 Update on the One Water Plan (Brian Mendenhall)
Recommendation: Receive an updated presentation on the Water Supply Master Plan and provide comment to the Board as necessary.

5.2 Review Agricultural Water Advisory Committee Work Plan, the Outcomes of Board Action of Committee Requests and the Committee's Next Meeting Agenda (Committee Chair)
Recommendation: Review the Board-approved Committee work plan to guide the committee's discussions regarding policy alternatives and implications for Board deliberation.

6. Clerk Review and Clarification of Committee Requests to the Board

This is a review of the Committee's Requests, to the Board (from Item 5). The Committee may also request that the Board approve future agenda items for Committee discussion.

7. Reports

Directors, Managers, and Committee members may make brief reports and/or announcements on their activities. Unless a subject is specifically listed on the agenda, the Report is for information only and not discussion or decision. Questions for clarification are permitted.

7.1 Director's Report
7.2 Manager's Report
7.3 Committee Member Reports
7.4 Links to Informational Reports

8. Adjourn: Adjourn to next regularly scheduled meeting at 1:30 p.m., **January 6, 2020**, in the Headquarters Building Boardroom, 5700 Almaden Expressway, San Jose, CA 95118

All public records relating to an open session 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.

The Santa Clara Valley Water District will make reasonable efforts to accommodate persons with disabilities wishing to attend committee meetings. Please advise the Clerk of the Board office of any special needs by calling 1-408-630-2277.

Agricultural Water Advisory Committee Purpose and Duties

The Agricultural Water Advisory Committee of the Santa Clara Valley Water District (District) is established per the District Act to assist the District Board of Directors (Board) with policies pertaining to agricultural water supply and use.

The specific duties are:

- Providing input on policy alternatives for Board deliberation, when requested by the Board.
- Providing comment on activities in the implementation of the District's mission that the Board will consider or refer to staff.
- Producing and presenting to the Board an Annual Accomplishments Report that provides a synopsis of the Committee's discussions regarding specific topics and subsequent policy recommendations, comments, and requests that resulted from those discussions.

In carrying out these duties, the Board's Committees bring to the District their respective expertise and the interests of the communities they represent. In addition, Board Committee members may bring information regarding District activities to the communities they represent.

This Page Intentionally Left Blank

Handouts

This Page Intentionally Left Blank

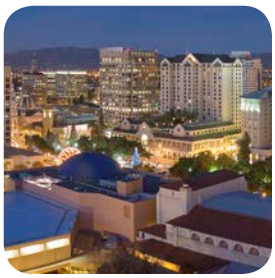
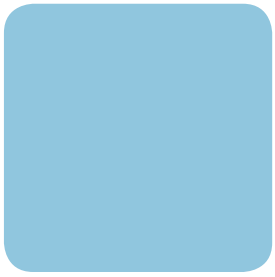
HANDOUT: AGENDA ITEM 5.1

DRAFT

JUNE 2019






Water Supply Master Plan

Valley Water

Clean Water • Healthy Environment • Flood Protection

Santa Clara Valley Water District
Draft Water Supply Master Plan 2040

Prepared by:

Tracy Hemmeter,
Senior Project Manager

Michael Martin
Associate Water Resource Specialist

Metra Richert,
Senior Water Resource Specialist

Cris Tulloch
Associate Water Resource Specialist

Samantha Greene, Ph.D.,
Senior Water Resources Specialist

Under the Direction of:

Jerry De La Piedra, Assistant Operating Officer
Garth Hall, Deputy Operating Officer
Nina Hawk, Chief Operating Officer
Norma J. Camacho, Chief Executive Officer

TBD, 2019

BOARD OF DIRECTORS

John L. Varela	District 1	Nai Hsueh, Vice Chair	District 5
Barbara Keegan	District 2	Tony Estremera	District 6
Richard Santos	District 3	Gary Kremen	District 7
Linda J. LeZotte, Chair	District 4		

Acknowledgments

Expert Panel

Paula J. Landis
Dr. Ed Mauer, Santa Clara University
David Mitchell, M.Cubed

Contributors

Benjamin Apollo
Neeta Bijoor, Ph.D.
Frances Brewster
Justin Burks
Ashley Carter
Marty Grimes
Bassam Kassab
Karen Koppett
Yaping Liu
Jennifer Martin
Anthony Mendiola
Eric Olson
Katherine Oven
Xiaoyong Zhan

Water Supply Master Plan 2040 Summary

A reliable supply of clean water is necessary for the social, economic, and environmental well-being of Santa Clara County. This is reflected in the Santa Clara Valley Water District (Valley Water) Act that states one of the purposes of Valley Water is "to do any and every lawful act necessary to be done that sufficient water may be available for any present or future beneficial use or uses of the lands or inhabitants within the District." Furthermore, Board Policy states that "there is a reliable, clean water supply for current and future generations." The Water Supply Master Plan 2040 (Master Plan) presents Valley Water's strategy for meeting the county's future water needs.

The Master Plan looks ahead at how our water needs and our water supply may change over the next 20 years. The population is likely to grow; aging water infrastructure must be maintained and renewed; additional regulations and land use changes may change how we use water; and climate changes are likely to alter the Sierra Nevada Mountains' snowpack resulting in longer and more severe droughts.

The Valley Water's Ensure Sustainability water supply strategy focuses on investments that secure our existing supplies and infrastructure, expand water conservation and reuse, and optimize our water infrastructure systems. Valley Water must secure existing supplies and facilities for future generations because they are, and will continue to be, the foundation of our water supply system. Valley Water is committed to working with the community to meet Silicon Valley's future increases in water demand through conservation, reuse, and other drought-resilient strategies. Finally, Valley Water has opportunities to make more effective use of its existing assets.

The Master Plan's Monitoring and Assessment Program (MAP) provides a mechanism for adapting to changing supply and demand conditions, climate change, regulatory and policy changes, other risks, and uncertainty. Through regular monitoring of specific projects and overall conditions, Valley Water will assess whether changes to the Master Plan strategy or projects are needed. Alternative projects will be evaluated based on their impacts to the water supply reliability, costs, relationships with other projects, risks and opportunities, and stakeholder input. Any changes to the Master Plan will be reflected in the annual water rate setting process, Capital Improvement Program, and budget.

page intentionally left blank

1 Table of Contents

Figures

Tables

Appendices

page intentionally left blank

1 A Reliable Water Supply Is Important to the Community

A reliable supply of clean water is necessary for the environmental, economic, and social well-being of Santa Clara County. A safe and reliable water supply extends beyond the significant social requirements of basic health and sanitation. This extension includes economic vitality, environmental needs, agricultural requirements, social benefits, cultural expectations and requirements, and quality of life enhancements. On behalf of the community, the Santa Clara Valley Water District (Valley Water) has made significant investments to manage demands for water and develop water supplies and infrastructure to meet the county's water needs. These investments currently enable Valley Water to manage the natural variability in demands and supplies to meet the county's current needs in all but critical drought years when Valley Water requests that the community reduce their water use. However, Valley Water anticipates that the county's need for water will grow in the future.

1.1 Santa Clara County Needs Water for Multiple Purposes

Long-term average water use in Santa Clara County is about 350,000 acre-feet per year (AFY). This water is used for domestic, municipal, industrial, and agricultural use.[1] Valley Water estimates that water demand would be higher, by about 77, 000 AF in 2018, if not for the combined efforts of Valley Water and the community to conserve water. Because of Valley Water's investments in water conservation since 1992, water use in the county has remained relatively consistent despite a 25 percent increase in population over the same period (Figure 1). The significant decreases in water use are associated with the droughts of 1987 to 1992, 2007 to 2009, and 2012 to 2016. Rainfall and economics also affect water use.

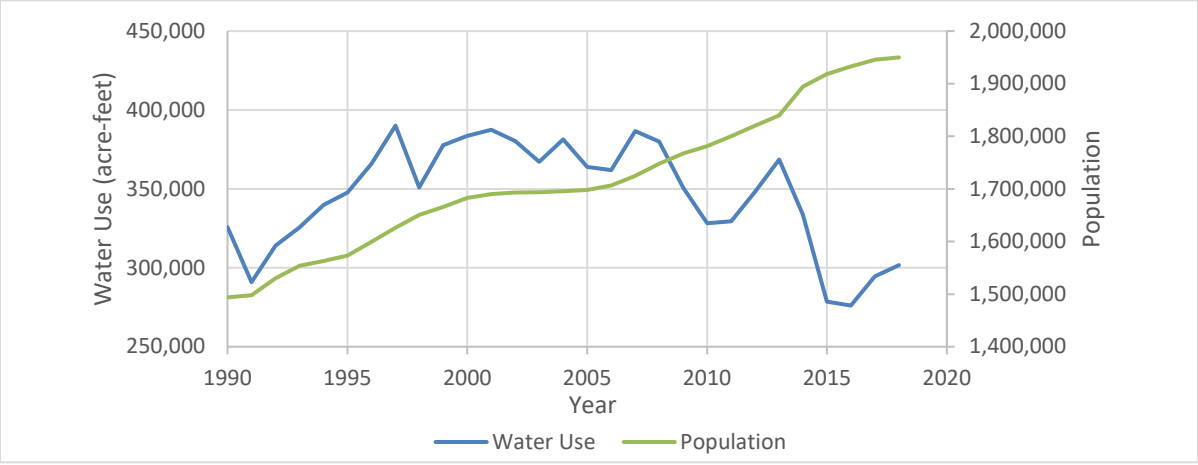


Figure 1. Historic Water Use and Population

[1] Environmental needs vary by year and are addressed in the supply side of the Valley Water's water supply system model, which allocates local water supplies to environmental requirements prior to use for recharge or treatment plants

The community uses water for several purposes, including residential, commercial, industrial, institutional, landscape irrigation, and agriculture. Figure 2 shows percentage of water use by these sectors. Residents, who need water for basic sanitation and to support their quality of life, account for almost half the water used each year in the county. Nearly one-half of residential water use is outdoors. Commerce, industry, and institutions need water for product manufacturing and delivery. Farmers need water to grow crops.

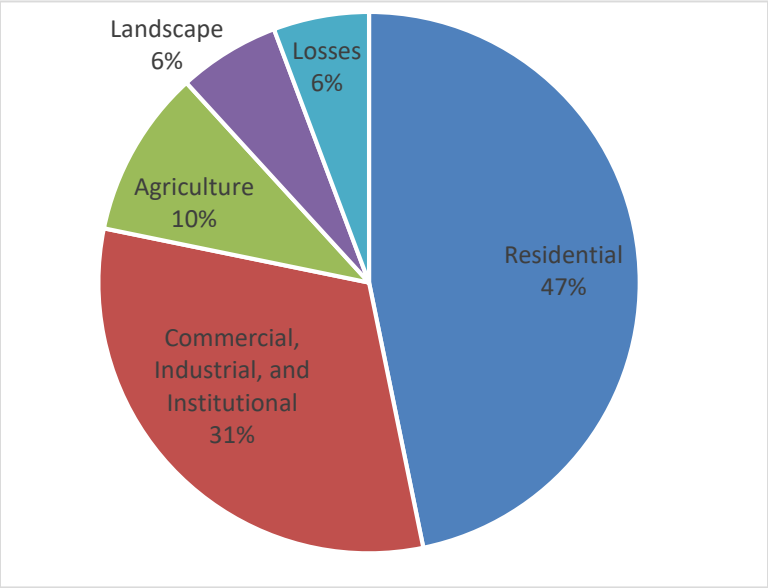


Figure 2. Water Use by Sector

The San Jose-Sunnyvale-Santa Clara Metropolitan Area had a gross domestic product of over $275 billion in 2017, the 13th highest in the nation (Bureau of Economic Analysis, 2018). Water shortages can have severe economic consequences. Shortage costs can range from about $85 million per year for a shortage of 10 percent up to $1.5 billion per year for a shortage of 50 percent (Appendix A, Cost Analysis Methodology). Furthermore, shortages can lead to groundwater overdraft and the resumption of inelastic land subsidence, which can damage the county's infrastructure and increase flooding risks.

1.2 Valley Water has Made Significant Investments in Water Supply Reliability

Valley Water is an independent special district/local agency that provides wholesale water supply, groundwater management, flood protection and stream stewardship. Its service area includes all of Santa Clara County, which is located at the southern end of San Francisco Bay (Figure 3). The county encompasses approximately 1,300 square miles and has a population of about 1.9 million. Most water use occurs on the valley floor between the Santa Cruz Mountains to the west and the Diablo Range to the east. Northern Santa Clara County is home to Silicon Valley and the valley floor is highly urbanized. Southern Santa Clara County has some urban development, but much of the land use is still rural and agricultural.

Valley Water was formed in 1929 in response to groundwater overdraft and significant land subsidence. Northern Santa Clara County had experienced land subsidence from pumping more groundwater than could be replaced or replenished through rainfall. In response, Valley Water constructed six reservoirs

in the 1930s to store winter rains for groundwater recharge and summer irrigation use. Four additional reservoirs were constructed in the 1950s, nearly tripling local storage to about 169,000 acre-feet (AF).

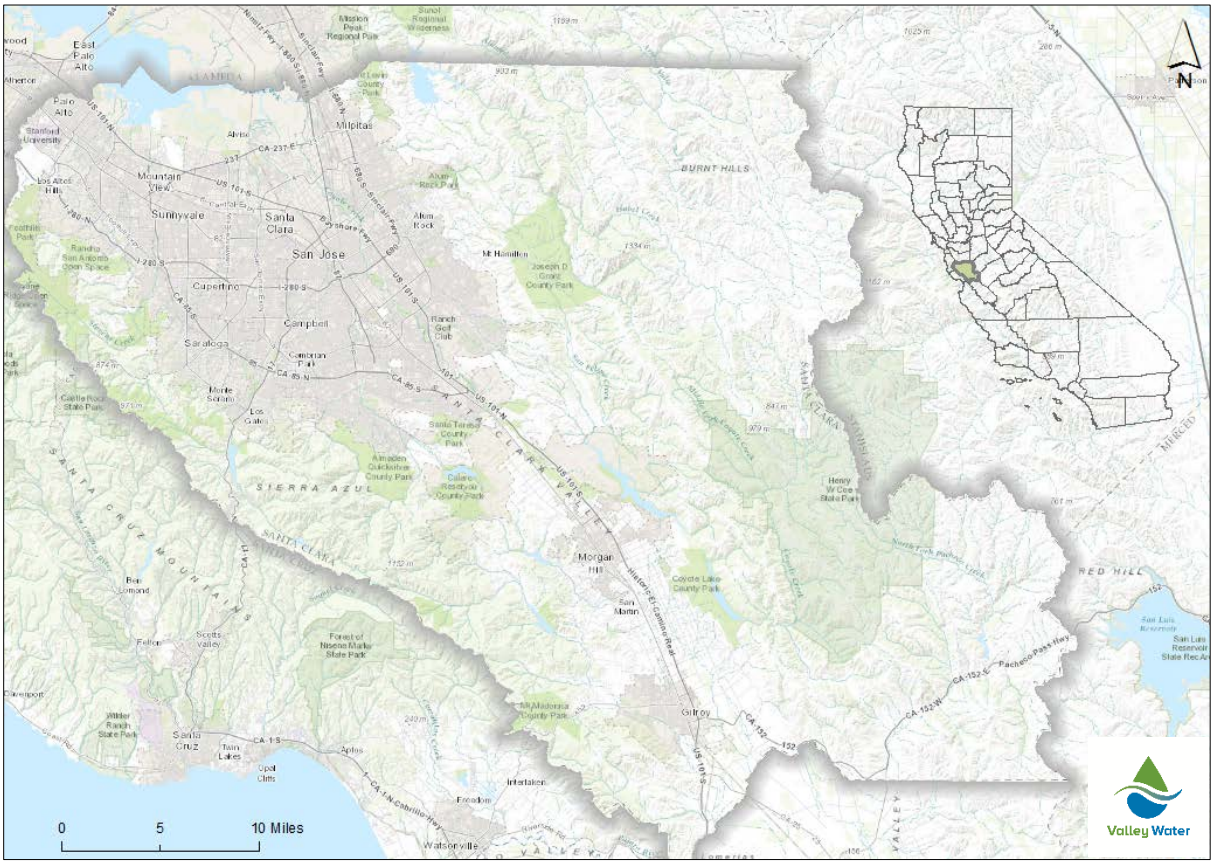


Figure 3. Santa Clara County

Still, local supplies were insufficient to meet the county's growing population and subsidence continued. In 1965, Valley Water began importing water from the State Water Project (SWP) for groundwater recharge and use at drinking water treatment plants. Valley Water began receiving water from the Federal Central Valley Project (CVP) in 1987. By the end of the 20th century, groundwater levels recovered and land subsidence was halted. The historic relationship between population growth, groundwater levels, land subsidence, and water sources is illustrated in Figure 4.

Valley Water operates an integrated water supply system to meet demands in Santa Clara County. This consists of 10 dams, 17 miles of canals, four water supply diversion dams, 393 acres of recharge ponds, 91 miles of controlled in-stream recharge, 142 miles of pipelines, three drinking water treatment plants, one advanced water purification center, and three pump stations. Local surface water and SWP and CVP water imported through the Sacramento-San Joaquin River Delta (Delta):

- replenish the local groundwater subbasins, which are pumped for use by individual well owners and retail water suppliers,
- supply Valley Water's drinking water treatment plants,
- are delivered directly to agricultural water users, and
- help meet environmental needs.

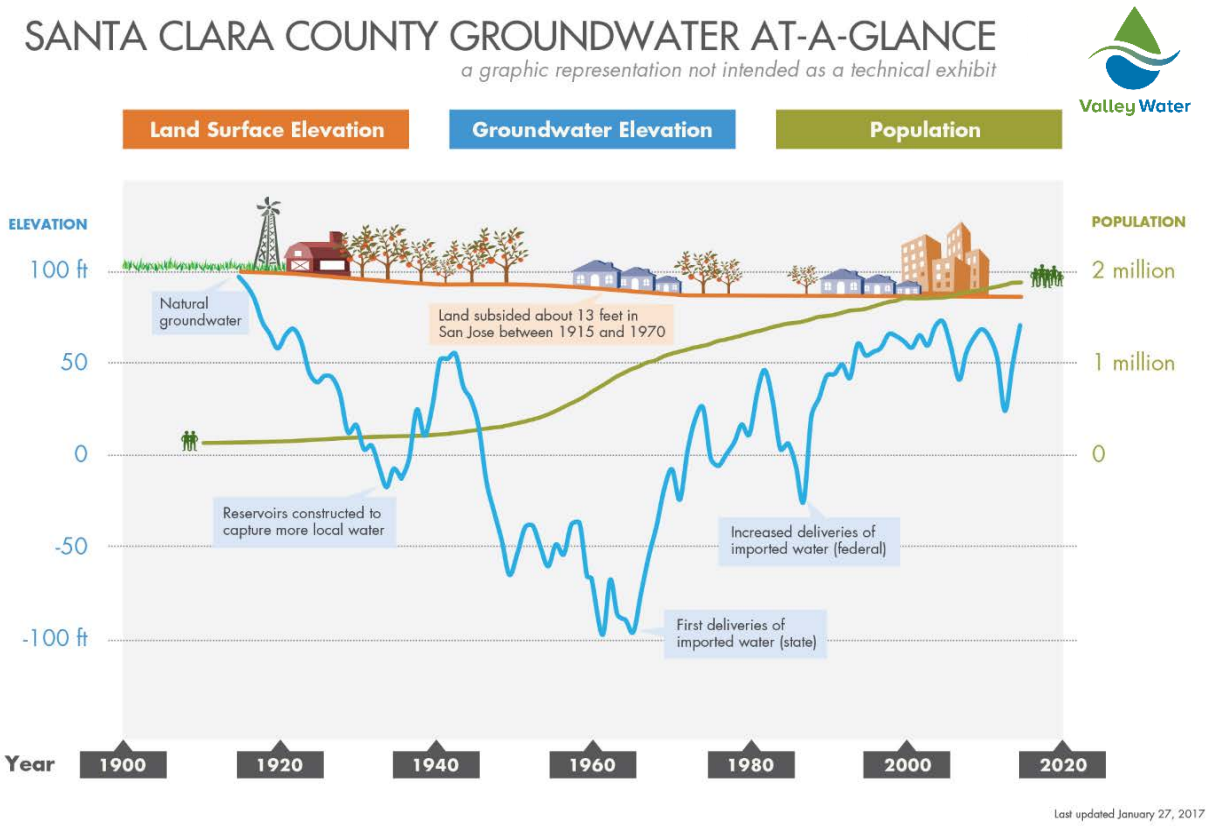


Figure 4. Relationship between Groundwater Levels, Land Subsidence, and Population

Valley Water manages groundwater supplies in conjunction with surface water supplies. In wet years, excess supplies are stored in the local groundwater basin, local and statewide reservoirs, or the Semitropic Groundwater Bank in Kern County for use in dry years. This helps Valley Water manage natural variations in rainfall and the associated variations in water supply availability.

Other agencies and organizations also contribute to water supply reliability in Santa Clara County. The San Francisco Public Utilities Commission (SFPUC) delivers water to retailers in northern Santa Clara County. Stanford University and San Jose Water Company hold their own surface water rights. All four of the county's wastewater treatment plants produce recycled water for non-potable uses such as irrigation and cooling towers. The county's water supply, treatment, and distribution facilities are illustrated in Figure 5.

Most water used in Santa Clara County is imported from outside the county, mostly through the SWP and CVP (about 45 percent). Another 15 percent is delivered through San Francisco's Regional Water System. Of local supplies, about 15 percent is natural groundwater recharge, 20 percent is local surface water, and 5 percent is recycled water.

District map

Water Supply Distribution

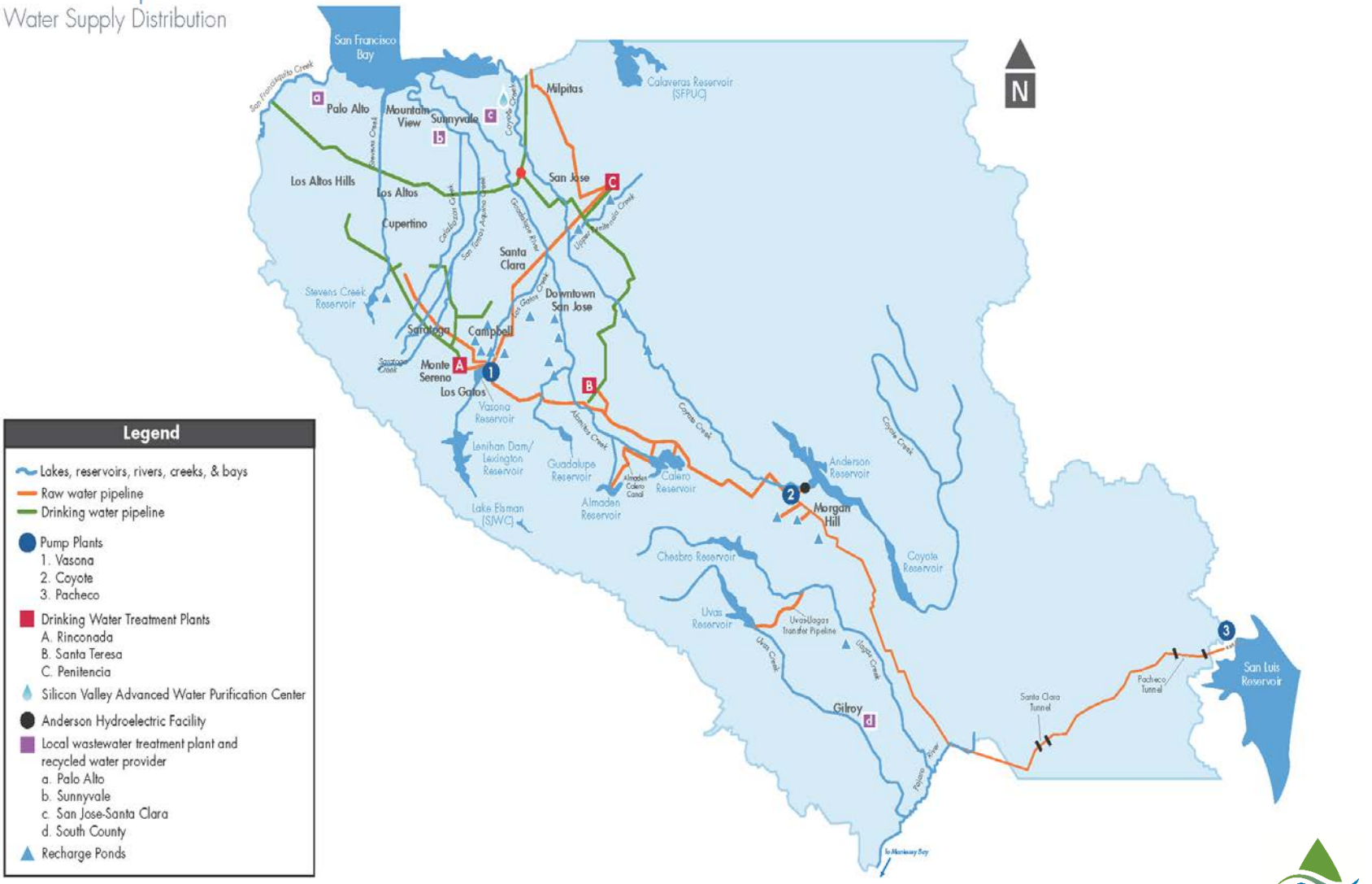


Figure 5. Water Supply Facilities

Valley Water

1.3 Need for the Water Supply Master Plan 2040

The Valley Water Act states that one of the purposes of Valley Water is "to do any and every lawful act necessary to be done that sufficient water may be available for any present or future beneficial use or uses of the lands or inhabitants within the District." Furthermore, Board Policy states that "there is a reliable, clean water supply for current and future generations." One of Valley Water's strategies for achieving this goal is to develop water supplies designed to meet at least 100 percent of average annual water demands in non-drought years and not call for water use reductions greater than 20% during drought years. The purpose, policy, and strategy recognize that a reliable water supply is vital to the social, economic, and environmental well-being of the county.

The Association of Bay Area Governments projects that the county's population will increase from about 1.9 million in 2015 to about 2.4 million by 2040 (Association of Bay Area Governments, 2013). Jobs are projected to increase from approximately 1 million in 2015 to approximately 1.2 million in 2040. Even though per capita water use continues to decline, Valley Water estimates that increases in population and jobs will result in an increase in water demands from the current long-term average of approximately 350,000 acre-feet per year (AFY) to a non-drought year demand of approximately 399,000 AF in 2040 (Appendix B, Demand Projection Methodology). Most of the increase in water demands will occur in northern Santa Clara County. Urban water use throughout the county is expected to increase, but rural and agricultural water use is expected to stay about the same. This projected increase in demands, along with projected reductions in supplies and ongoing risks, means that additional water supply investments will be needed to provide a reliable water supply in the future.

1.4 Contents and Use of this Report

The Master Plan is organized as follows:

- Chapter 1 - The Importance of Water Supply Reliability: discusses the community's water use and needs, Valley Water's role in meeting those needs, and the need for the Master Plan.
- Chapter 2 – Valley Water Needs to Develop Supplies for Future Droughts: describes the water supply outlook, challenges, and risks to providing a reliable future water supply in Santa Clara County.
- Chapter 3 – The Water Supply Strategy Ensures Sustainability: presents Valley Water's strategy for meeting the county's future water supply needs.
- Chapter 4 – Monitoring Will Help Us Stay on Track: describes how the water supply strategy will be monitored and adjusted over time to ensure Valley Water is on track with its water supply investments
- Chapter 5 - References

The modeling results is this report are based on demand, supply, and operating assumptions as of May 2019. Valley Water constantly reviews and refines it models. Future reports will reflect updated modeling results and, if appropriate, make recommendations for revisions to the Master Plan.

page intentionally left blank

2 Valley Water Needs to Develop Supplies for Future Droughts

This chapter describes the water supply reliability outlook for Santa Clara County. The Master Plan evaluates the ability to meet projected water demands through Year 2040 with the baseline water supply system. The evaluation shows existing supplies are sufficient to meet most future demands in normal years, but will not meet needs in future droughts. In addition, risks such as climate change, changes to regulations, and new policies could affect future water supply reliability.

2.1 Baseline Water Supplies

The baseline water supply system consists of existing water supplies and infrastructure, including several improvements. The Master Plan assumes Valley Water will improve existing dams to remove operating restrictions, complete the Rinconada Water Treatment Plant Reliability Improvement project, upgrade Vasona Pumping Plant, rehabilitate pipelines, support water retailers' efforts to increase non-potable recycled water use to about 33,000 AFY in 2040, and increase water conservation savings to about 99,000 AFY by 2030. The Master Plan assumes declining Delta-conveyed imported water reliability as a baseline condition, which is consistent with historic trends. Lastly, the Master Plan assumes Valley Water makes reservoir releases consistent with environmental requirements and commitments, including the Fisheries and Aquatic Habitat Collaborative Effort (FAHCE) and regulatory permits.

The Master plan also assumes that existing infrastructure is maintained consistent with Valley Water's Asset Management Plan and that Valley Water works with other agencies to maintain and manage their assets that support water supply reliability in Santa Clara County.

Modeling indicates that the baseline system will be able to meet non-drought year demands through 2025. However, shortfalls between supplies and demands begin in Year 2030. Figure 6 and Table 1 show projected average water supply use and non-drought year demands through Year 2040. The modeling assumes decreased Delta-conveyed supplies due to increased regulatory restrictions in year 2030. Valley Water's water supply system model and assumptions are described in Appendix C.

Baseline Water Supply System

- Conservation savings increasing from about 77,000 AF in 2018 to about 99,000 AFY by 2030
- Existing natural groundwater recharge
- Existing local surface water supplies with Fisheries and Aquatic Habitat Collaborative Effort (FAHCE) reservoir releases and flow requirements
- Recycled water use increasing from about 18,000 AF in 2018 to about 33,000 AFY in 2040
- Existing imported water supplies
- Dam seismic retrofits and other improvements to remove operating restrictions
- 10-Year Pipeline Rehabilitation
- Vasona Pumping Plant Upgrade
- Rinconada Water Treatment Plant Reliability Improvement

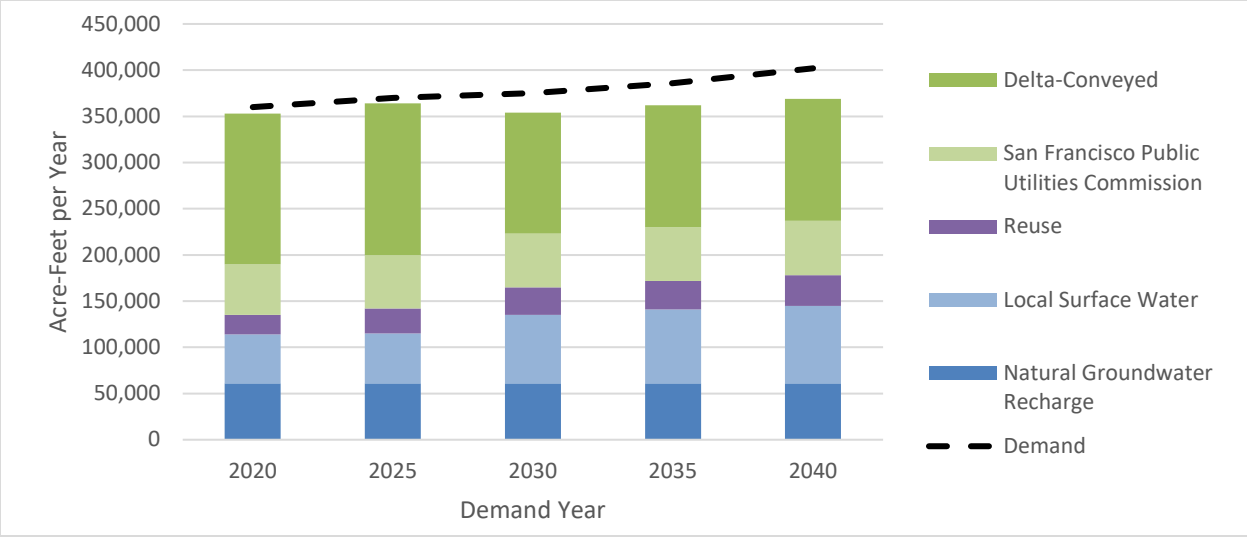


Figure 6. Average Baseline Water Supply Through 2040

Table 1. Average Baseline Water Supply Through 2040

Source of Supply (Acre-Feet)	2020	2025	2030	2035	2040
Natural Groundwater Recharge	61,000	61,000	61,000	61,000	61,000
Local Surface Water	53,000	54,000	74,000	80,000	84,000
Recycled Water	21,000	27,000	30,000	31,000	33,000
San Francisco Public Utilities Commission	55,000	58,000	58,000	58,000	59,000
Delta-Conveyed	163,000	164,000	131,000	132,000	132,000
Average Supply	354,000	365,000	354,000	362,000	368,000
Demand	360,000	370,000	375,000	386,000	402,000

2.1.1 Local Water Supply Sources

The groundwater subbasins are naturally recharged with rainfall, seepage from surrounding hills, seepage into and out of the groundwater subbasin, leakage from pipelines, and irrigation return flows. Natural groundwater recharge varies based on rainfall and groundwater levels. On average, natural groundwater recharge provides about 61,000 AFY of supply.

Local reservoirs capture rainfall and run-off. This water is used for recharge, irrigation, or drinking water treatment. Currently, Valley Water surface water supplies are constrained to an average of about 44,000 AFY by operating restrictions on local reservoirs for seismic safety. Improvements to Anderson and Guadalupe Dams are scheduled to be completed before 2030 and improvements to Calero and Almaden Dams are scheduled to be completed before 2035. On average, Valley Water's local surface water supplies will provide about 73,000 AFY in 2040. On average, San Jose Water Company and Stanford University local surface water supplies provide about 11,000 AFY.

Recycled water is a local water supply source that is not dependent on rainfall. Recycled water is produced by the county's four publicly-owned wastewater treatment plants. It is municipal wastewater that has been treated to levels that make it appropriate for various non-drinking water (non-potable) purposes. In addition, Valley Water provides advanced treated purified water to South Bay Water Recycling to improve the quality of the non-potable supply. Non-potable recycled water use is projected to increase from about 21,000 AFY in 2015 to about 33,000 AFY in 2040.

Anderson Reservoir is currently being operated at 52% of capacity due to seismic concerns with the dam at full capacity.

2.1.2 Imported Water Supply Sources

Imported supplies are used to meet a large percentage of county water needs–about 55 percent on average. Imported water conveyed though the Delta via the State Water Project (SWP) and Central Valley Project (CVP) is used to supply Valley Water's drinking water treatment plants, groundwater recharge facilities, and irrigators. On average, more than 70 percent of Delta-conveyed supply is delivered to treatment plants, almost 30 percent is used for recharge, and a small percentage is delivered to irrigators. In addition, when available, Valley Water stores excess Delta-conveyed supplies in the Semitropic Groundwater Bank and San Luis Reservoir in the Central Valley, and locally in Anderson and Calero Reservoirs. Valley Water has a contract for 100,000 AFY of SWP water and 152,500 AFY of CVP water. However, the actual amount of water allocated under these contracts each year is typically less than these contractual amounts and depends on hydrology and regulatory restrictions. The average allocation of Delta-conveyed water projected for 2020 is about 171,000 AFY. However, without additional investments, Valley Water expects average allocations to decline over time to an average of about 133,000 AFY in 2040. Average Delta-conveyed imported water use in the model is lower than allocations as a result of water being left behind in the Semitropic Groundwater Bank according to contract requirements, carryover losses in extremely wet years, and evaporation from surface water reservoirs.

Santa Clara County began receiving San Francisco Public Utilities Commission (SFPUC) water to supplement local supplies in 1952. This water is provided to north county cities with access to SFPUC's Regional Water System. On average, the SFPUC delivers about 55,000 AFY to Santa Clara County. This amount is expected to increase slightly to 59,000 AFY in 2040 as SFPUC customer demands increase.

2.1.3 Supply Variability and Hydrology

Santa Clara County, like the rest of California, experiences drastic changes in year-to-year annual precipitation. The variation in precipitation, both locally and in the imported water watersheds, results in fluctuations in the amount of water supply available from year to year. In many years, annual supplies exceed demands, while in some year's demands can greatly exceed supplies. Figure 7 and

Table 2 illustrate the availability of different water supplies in a very wet year, on average, and in a very dry year in 2040. The supplies shown do not include the use of reserves, which will lessen any shortfalls in dry years. The long-term average supplies in Table 2 are different than the supplies in Table 1, because Table 1 and the remaining tables in this report, show how much available supply Valley Water can use and does not include environmental flows. Table 2 shows all the water that is flowing into the county on average.

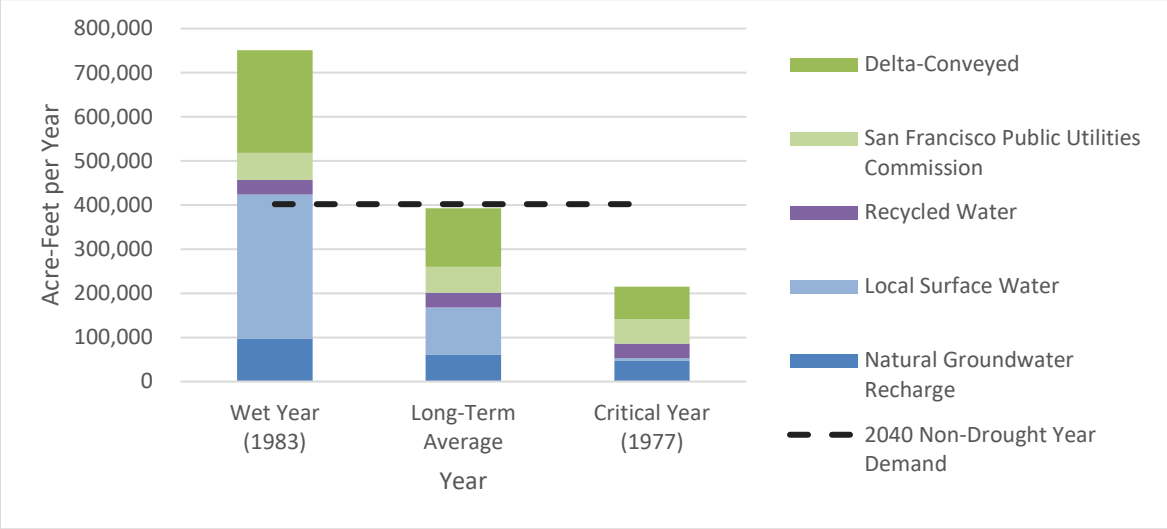


Figure 7. Projected Baseline Water Supply Availability in 2040 under Different Hydrologic Conditions

Table 2. Projected Baseline Water Supply Availability in 2040 under Different Hydrologic Conditions

Source of Supply (Acre-Feet)	Wet Year (1983)	Long-Term Average	Critical Year (1977)
Natural Groundwater Recharge	97,000	61,000	47,000
Local Surface Water	327,000	107,000	6,000
Recycled Water	33,000	33,000	33,000
San Francisco Public Utilities Commission	61,000	59,000	56,000
Delta-Conveyed	233,000	133,000	73,000
Total Supply (Acre-Feet)	**751,000**	**393,000**	**215,000**

Valley Water's basic water supply strategy to compensate for supply variability is to store excess wet year supplies in the groundwater basin, local reservoirs, San Luis Reservoir, or Semitropic Groundwater Bank. Valley Water draws on these reserve supplies during dry years to help meet demands. These reserves are sufficient to meet demands during a critical dry year and the first several years of an extended drought.

2.2 Future Droughts are the Primary Water Supply Challenge

Water supply reserves (e.g., water banked in the Semitropic Water Bank) are insufficient to meet needs throughout an extended drought. Modeling indicates shortages during droughts in all demand years, with shortages increasing in severity and frequency as demands increase and Delta-conveyed supplies decrease. By 2040, without new supplies or conservation savings, shortages could occur in about 40

percent of years and water supplies would only be able to meet about 60 percent of normal demand during some years. Short-term water use reductions of up to 50 percent would be needed to minimize the risk of land subsidence and avoid undesirable groundwater conditions. Figure 8 and Table 3 show the supplies and groundwater reserves that would be used with Year 2040 demands during a six-year drought like the one that occurred between 1987 and 1992. Reserves are more available in Drought Year 4 because the water use reductions in Drought Year 3 allowed groundwater conditions to improve. However, reserves are depleted by Drought Year 5.

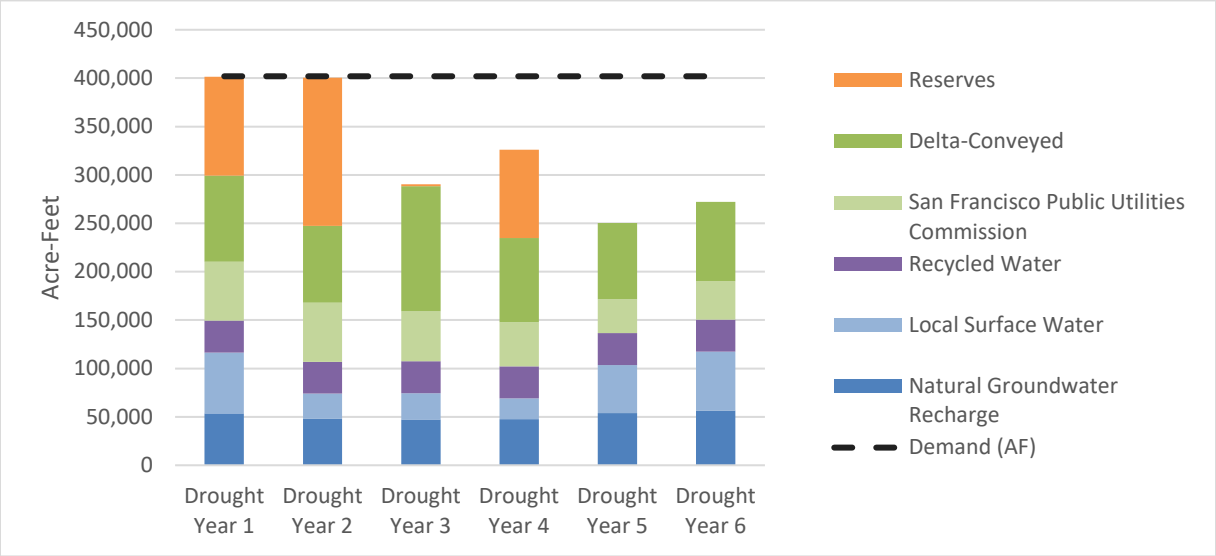


Figure 8. Baseline Water Supplies During an Extended Drought with Year 2040 Demands

Table 3. Baseline Water Supplies During an Extended Drought with Year 2040 Demands

Source of Supply (AF)	Drought Year 1	Drought Year 2	Drought Year 3	Drought Year 4	Drought Year 5	Drought Year 6
Natural Groundwater Recharge	54,000	48,000	47,000	48,000	54,000	57,000
Local Surface Water	63,000	26,000	27,000	21,000	50,000	61,000
Recycled Water	33,000	33,000	33,000	33,000	33,000	33,000
San Francisco Public Utilities Commission	61,000	61,000	52,000	46,000	35,000	40,000
Delta-Conveyed	89,000	79,000	129,000	87,000	79,000	82,000
Reserves	102,000	152,000	2,000	91,000	0	0
Total Supply (AF)	**401,000**	**401,000**	**290,000**	**326,000**	**250,000**	**272,000**
Shortfall	**1,000**	**1,000**	**112,000**	**76,000**	**152,000**	**130,000**

2.3 Other Water Supply Challenges and Uncertainties

Droughts are the greatest challenge to water supply reliability. However, other significant challenges and uncertainties need to be considered as part of the Water Supply Master Plan. These include climate change, additional regulatory requirements, and land use decisions.

2.3.1 Climate Change

The impacts of climate change are already being felt in the San Francisco Bay Area and northern California. Average annual maximum temperatures have increased by 1.7°F since 1950, sea level has risen over 8 inches in the last 100 years, and the 2012-2016 drought led to a 1-in-500 year low in Sierra snowpack and $2.1 billion in economic losses statewide. These changes are projected to increase significantly in the coming decades. The Bay Area will likely see a significant temperature increase by mid-century. Precipitation will continue to exhibit high year-to-year variability, with very wet and very dry years. Average Sierra Nevada snowpack is projected decline, up to 60 percent in mid-century under a high greenhouse gas emissions scenario. Future increases in temperature will likely cause longer and deeper droughts. These impacts will affect the quantity of available water and quality of water supplies (Ackerly et al., 2018).

Climate change is a global phenomenon, though it is manifested differently in different regions.

Valley Water's water supply vulnerabilities to climate change include:

- Decreases in the quantity of imported water supplies: More precipitation falling as rain and earlier snowmelt may exceed the storage capabilities of the existing SWP and CVP reservoirs. Increases in temperature and evapotranspiration may also lead to a higher intensity of droughts, which can decrease imported water allocations. Rising air temperatures also increase the water temperatures, which can lead to increased evaporation rates, a higher risk of harmful algal blooms, and negative impacts to fish and wildlife, all of which can impact the availability of imported water supplies for Santa Clara County. Sea level rise may also have negative impacts on imported water supplies, largely because of saltwater intrusion into the Sacramento-San Joaquin Delta. Saltwater intrusion can impact water supply allocations, as more fresh water may be needed to hold back the saltwater, making it unavailable for CVP and SWP use. Sea level rise will also put additional pressure on the fragile delta levees, making them more susceptible to failure.
- Increases in seasonal irrigation demands: Higher temperatures will increase agricultural, residential, and commercial/institutional irrigation demands. About 40 percent of water use in the county is for irrigation.
- Increases in cooling water demands: The county has several energy plants, multiple data centers, and facilities with cooling towers. Higher temperatures may also increase demands by these users.

- Decreases in the ability to utilize local surface water supplies: Shifts in the timing and intensity of rainfall and runoff could affect the ability to capture and use local surface water supplies. It is difficult to capture rainfall when it comes in a few intense storms, because reservoirs are more likely to fill and spill, or releases are needed to make room for the storm flows. When it is wet, there are typically lower demands for water, so the storm flows are difficult to put to immediate use. Thus, even if average annual rainfall stays the same, the ability to utilize local supplies may decrease.
- Decreases in water quality: Higher temperatures, wildfire, and changes in flow patterns could result in more algal blooms, increased turbidity, and increased salinity in imported and local surface water supplies. Sea level rise could also contribute to increased salinity in Delta-conveyed supplies. At a minimum, changes in water quality require additional monitoring. Often, they require changes to treatment processes. Sometimes, they can result in the interruption of supplies from the CVP or SWP.

Drought-resistant landscaping helps reduce demands on water.

- Increases in the severity and duration of droughts: Droughts are already Valley Water's greatest water supply challenge. With increases in demands and reductions in supplies, this challenge will only grow. Without additional supplies and demand management measures, Valley Water would need to call for more frequent and severe water use reductions. These actions affect the economic and social well-being of the county. More severe and longer droughts will also affect the environmental well-being of the county.

Valley Water needs to implement a water supply strategy that will adapt well to future climate change by managing demands, providing drought-proof supplies, and increasing system flexibility in managing supplies and water quality.

2.3.2 Additional Regulations and Permit Requirements

Valley Water water supplies have been affected by new regulatory requirements in the past and additional requirements are anticipated in the future. Locally, the greatest impact of regulations has been on instream recharge operations. Historically, Valley Water constructed gravel dams to increase groundwater recharge within creeks and released water from reservoirs to maximize recharge. However, over 25 years, Valley Water has revised its instream recharge operations to comply with new regulatory requirements and better balance water supply operations with fishery and other environmental needs. Additional changes are anticipated in the future as Valley Water implements the settlement agreement produced by the Fish and Aquatic Habitat Collaborative Effort (FAHCE) in 2003. These past and anticipated future changes limit Valley Water's ability to use creeks for conveying and

recharging water. Groundwater recharge is a key component of Valley Water's conjunctive use program.

Imported water supplies have also been affected by regulations related to environmental protection. Valley Water holds contracts with the California Department of Water Resources (DWR) and U.S. Bureau of Reclamation for up to 252,500 AF per year of supplies from the SWP and CVP, with actual deliveries subject to availability of water supplies and the satisfaction of regulatory constraints to protect fish, wildlife, and water quality in the Sacramento-San Joaquin Delta. These Delta-conveyed imported water deliveries from the SWP and CVP have been negatively impacted by significant restrictions on Delta pumping required by biological opinions issued by the U.S. Fish and Wildlife Service in 2008 and National Marine Fisheries Service in 2009. Based on modeling projections provided by DWR, future average imported water deliveries could decrease with additional regulatory restrictions and impacts from climate change.

The California Aqueduct delivers Delta-conveyed supplies to municipal, industrial, and agricultural customers

The State Water Resources Control Board (State Water Board) approved amendments to the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan) in December 2018 that will result in increased restrictions on water users within the San Joaquin Basin (Basin), potentially reducing SFPUC supplies. State Water Board staff are working with Basin stakeholders to develop voluntary agreements that will achieve an equivalent level of environmental protection while reducing impacts on water supplies. If these voluntary agreements are not developed and adopted by the State Water Board as an alternative to the December 2018 approved changes and the objectives in the recently approved plan are implemented, SFPUC supplies to Santa Clara County retailers will likely be reduced, which could increase demand for Valley Water supplies.

2.3.3 Demands

The Master Plan includes demand projections in five-year increments through Year 2040, but these long-term demand projections are uncertain. Water use is affected by multiple factors, including population, number of jobs, type of use, weather, economic conditions, social behavior, and regulations. Each of these factors has its own inherent uncertainties in projections and/or are too variable to predict over a 20-year planning horizon. For example, we know the regulations implementing the State's "Making Conservation a Water of Life" will include outdoor water use targets. However, we do not currently know what those targets will be and whether they will be achieved on schedule. We also know that maximum high temperatures will almost certainly increase, but we do not know how that will affect

irrigation and cooling demands. We can anticipate an economic recession over the next 20 years, but we cannot predict when it will occur.

Historically, actual demands have been lower than those projected in prior long-term plans. For example, Valley Water's 2005 Urban Water Management Plan had a demand projection of 396,000 AF for 2015. Actual water use in 2015 was about 283,000 AF, which was low due to severe drought reductions, and actual water use in 2013 (before the drought) was about 367,000 AF. Some of the variation between projected and actual water use is related to using conservative projections to ensure we are planning for sufficient water supplies. Some of the variation is related to other factors such as regulations, social behavior, and type of water use.

2.3.4 Other

The greatest risk to natural groundwater recharge is a reduction in pervious surfaces due to an expanded urban footprint. Activities that keep water onsite and protect open spaces on the valley floor will help maintain natural groundwater recharge.

Open spaces and agriculture help maintain natural infiltration/recharge.

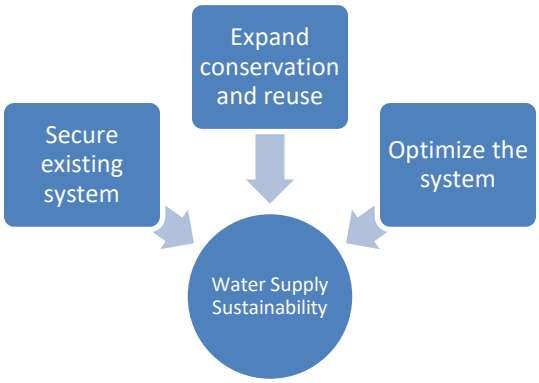
The quantity of SFPUC supplies used in the county could be reduced in the future. This could result from retailers' shifting their use of SFPUC to other supplies, future decreases in demand, or changing regulations. This could also result from SFPUC discontinuing deliveries to San Jose and Santa Clara, because these cities have interruptible contracts with SFPUC. SFPUC, the cities, and Valley Water are looking at options to make San Jose and Santa Clara permanent SFPUC customers.

Valley Water continues to monitor those risks that can change the water supply outlook and works to influence key external decisions that have the potential to impact water supply reliability. The Master Plan will be reviewed annually and updated at least every five years based on the monitoring and assessment plan described in Chapter 4. This planning cycle allows risks to be evaluated on an ongoing basis, so that the water supply strategy can be updated as better information becomes available.

3 The Water Supply Strategy Ensures Sustainability

Valley Water's Ensure Sustainability water supply strategy relies on the following three elements to provide a reliable supply of water to meet needs through 2040:

1. secure existing supplies and infrastructure,
2. increase water conservation and water reuse, and
3. optimize the use of existing supplies and infrastructure.



This strategy ensures sustainability because it maintains and builds on the existing baseline system, develops drought-resistant supplies to meet drought needs, and manages risks to water supply reliability from climate change and other risks and uncertainties.

No individual project can address the county's future water supply needs, so various combinations of projects were evaluated for their ability to meet Valley Water's reliability goal under various scenarios. Several different approaches or strategies will meet Valley Water's water supply reliability goals, but they all have tradeoffs. Some strategies rely heavily on projects that perform well during droughts and in a changed climate, but they are more expensive. Other strategies rely on lower cost projects, but are more susceptible to risks. Some strategies include projects that have environmental or other benefits, but lower water supply reliability benefits. Some projects are preferred more than others by the community. Stakeholders all agree that 1) water supply reliability is important; 2) we should maximize water conservation, water reuse, and stormwater capture; and 3) we need to keep water rates affordable. Based on stakeholder input, technical analyses, and the climate of uncertainty, the Ensure Sustainability strategy provides a framework for balancing multiple needs and interests while making effective and efficient investment decisions.

3.1 The Elements of the Ensure Sustainability Water Supply Strategy Work Together

The Ensure Sustainability strategy elements work together to protect and build on past investment in water supply reliability, leverage those past investments to increase flexibility, and develop alternative supplies and demand management measures to manage risk and meet future needs, especially during extended droughts in a changing climate. These elements, combined with Valley Water's Asset Management and Infrastructure Reliability programs, provide a pathway to a sustainable water supply system. The water supply strategy elements, and the associated projects for this Master Plan, are discussed below. Information on specific projects that are currently in the plan and that have been evaluated for inclusion in the plan is summarized in Appendix D (Project List).

3.1.1 Secure Existing Supplies and Infrastructure

Valley Water should secure existing supplies and facilities for future generations because they are, and will continue to be, the foundation of the county's water supply system. The baseline water supply system was described in Section 2.1. Annual water supply use is projected to be about 354,000 AFY in 2020 and about 368,000 AFY in 2040. While local water supplies are expected to increase as the dams are retrofitted and non-potable reuse expands, Delta-conveyed imported water supplies are expected to decline as a result of regulations and climate change.

Non-potable reuse (purple pipe) reduce demands on potable supplies.

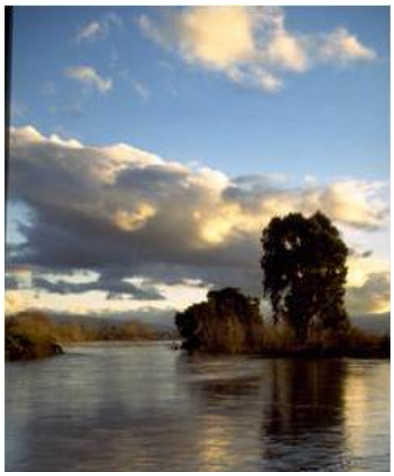
The Ensure Sustainability strategy includes Valley Water participation in California WaterFix. California WaterFix involves constructing alternative conveyance (one tunnel) capable of diverting up to 9,000 cubic feet-per-second from the Sacramento River north of the Delta and delivering it to the SWP and CVP pumps at the southern end of the Delta. This would result in less impactful diversions, help maintain existing deliveries, improve the ability to do transfers, and protect water quality from sea level rise. The Board decided to participate in California WaterFix on May 8, 2018. The most recent estimates are that the project could improve average Delta-conveyed imported supply use to 170,000 AFY, though the project definition and yields are currently under review by the State.

3.1.2 Increase Water Conservation and Reuse

Demand management, stormwater capture, and water reuse are critical elements of the water supply strategy. They perform well under current climate conditions and late-century climate change. Water recycling and reuse provide local supplies that are not directly hydrologically dependent, so they are resilient to extended droughts when Valley Water most needs additional supplies. They make efficient use of existing supplies, so they are sustainable. In addition, these activities are broadly supported by stakeholders.

The Master Plan includes a "Water Use Efficiency" (WUE) package of water conservation and stormwater projects and programs. Specific projects include incentivizing the use of advanced metering infrastructure (AMI); customer side leak repair incentives; graywater program expansion; rebates for the installation of rain barrels, cisterns, and rain gardens; partnerships to construct stormwater capture basins; and an agricultural land recharge project. The WUE package should reduce future demands by an additional 10,000 AFY (above the current target of 99,000 AFY of savings by 2030) and increase water supplies by about 1,000 AFY by 2040.

The Master Plan also includes developing at least 24,000 AFY of additional reuse (above the current target of 33,000 AFY of non-potable reuse) by 2040. This could be potable reuse and/or non-potable recycled water (purple pipe). For budget and schedule purposes, the Master Plan assumes the reuse target will be achieved through by implementing the Los Gatos Ponds Potable Reuse Project through a public-private partnership. The Los Gatos Ponds Potable Reuse Project involves purifying water at an expanded Silicon Valley Advanced Water Purification Center in Alviso, pumping the water to Campbell, and using the purified water for groundwater recharge in the existing ponds along Los Gatos Creek. Valley Water is currently developing a Countywide Water Reuse Master Plan that will identify other options for achieving the Master Plan's reuse target.



Potable reuse includes delivering purified recycled water to groundwater recharge ponds

3.1.3 Optimize the Use of Existing Supplies and Infrastructure

This element of the Ensure Sustainability strategy includes projects that increase Valley Water's ability to use existing supplies and infrastructure. Valley Water's existing supplies are more than sufficient to meet current and future needs in wet and above normal years. In some years, supplies exceed needs and additional facilities would increase flexibility and the ability to use or store those excess supplies. Additional infrastructure could increase Valley Water's ability to respond to outages and challenges such as droughts and water quality problems.

The Master Plan includes three projects that optimize the use of existing supplies and infrastructure – Pacheco Reservoir, Transfer-Bethany Pipeline, and South County Recharge. Pacheco Reservoir is consistent with the Board's priority to actively pursue efforts to increase water storage opportunities. The project, through a partnership with Pacheco Pass Water District, San Benito County Water District, and potentially other partners, will enlarge Pacheco Reservoir from about 6,000 AF to about 140,000 AF and connect the reservoir to the San Felipe Division of the CVP. The reservoir will be used to store local runoff and CVP supplies and operated to provide water for fisheries downstream of the reservoir and increase in-county storage. Other potential benefits could include managing water quality impacts from low-point conditions in San Luis Reservoir and downstream flood protection.

The Transfer-Bethany pipeline will connect Contra Costa Water District's Los Vaqueros Reservoir and Delta intakes to the State Water Project.

The Transfer-Bethany Pipeline will be a pipeline that connects Contra Costa Water District's (CCWD's) system to Bethany Reservoir, which serves the South Bay Aqueduct and the California Aqueduct. This project will enable Valley Water to receive Delta surplus supplies and some contract supplies through CCWD's system in the Delta instead of or in addition to the CVP and SWP pumps in the southern Delta. This will increase reliability and flexibility for Valley Water. The project would also facilitate other potential regional projects. This project is a partnership between CCWD, Valley Water, and agencies in the Bay Area and Central Valley as part of the larger Los Vaqueros Reservoir Expansion Project.

South County Recharge includes increasing groundwater recharge capacity in the northern end of the Llagas Subbasin, either through reoperation of existing facilities or connecting existing facilities to additional water sources. This will enable Valley Water to capture more wet season water and maintain groundwater levels during droughts.

Both the Transfer-Bethany Pipeline portion of the Los Vaqueros Reservoir Expansion and the Pacheco Reservoir Expansion increase Valley Water's water supply operations flexibility and increase emergency water storage. The State, which conditionally approving more than $450 million for each of the projects, recognized those projects also provide ecosystem improvements, recreation opportunities, and/or flood protection benefits.

The three projects – South County Recharge, Pacheco, and Transfer-Bethany Pipeline – would provide a combined average annual yield of about 5,000 AFY, increase system flexibility, and/or emergency supply.

3.2 Water Supply Reliability Improvements Meet the Level of Service Goal

The Valley Water Board approved an updated long-term water supply reliability level of service goal on January 14, 2019 (Appendix E, January 14, 2019 District Board Agenda Package). The goal is to develop supplies to meet at least 100 percent of annual water demand identified in the Valley Water's Master Plan during non-drought years and at least 80 percent of annual water demand in drought years. This level of service goal balances the goals of minimizing shortages and minimizing costs. The community demonstrated its ability to manage shortages by achieving water use reductions of almost 30 percent in the 2012 to 2016 drought.

The Master Plan projects (California WaterFix, WUE projects, 24,000 AFY of potable reuse, Pacheco, Transfer-Bethany Pipeline, and South County Recharge), along with the baseline supplies and infrastructure, meet the water supply reliability level of service goal in all demand years except 2030. Modeling indicates that water use reductions of up to 30 percent could be needed at the end of a

repeated 1987 to 1992 drought, though an additional 8,000 AF of supply in 1992 would reduce the call for water use reductions to 20 percent. Rather than add a project to address a small shortage in a single year, this small shortage will be managed through the monitoring and assessment plan discussed in Chapter 4. Figure 9 and Table 4 show average water supply use and non-drought year demands in five-year increments through 2040. Average supplies are less than demands in some demand years, because the supply reflects how much supply the county can use on average, including in years with shortages, and demands are projected demands before water use reductions in drought years.

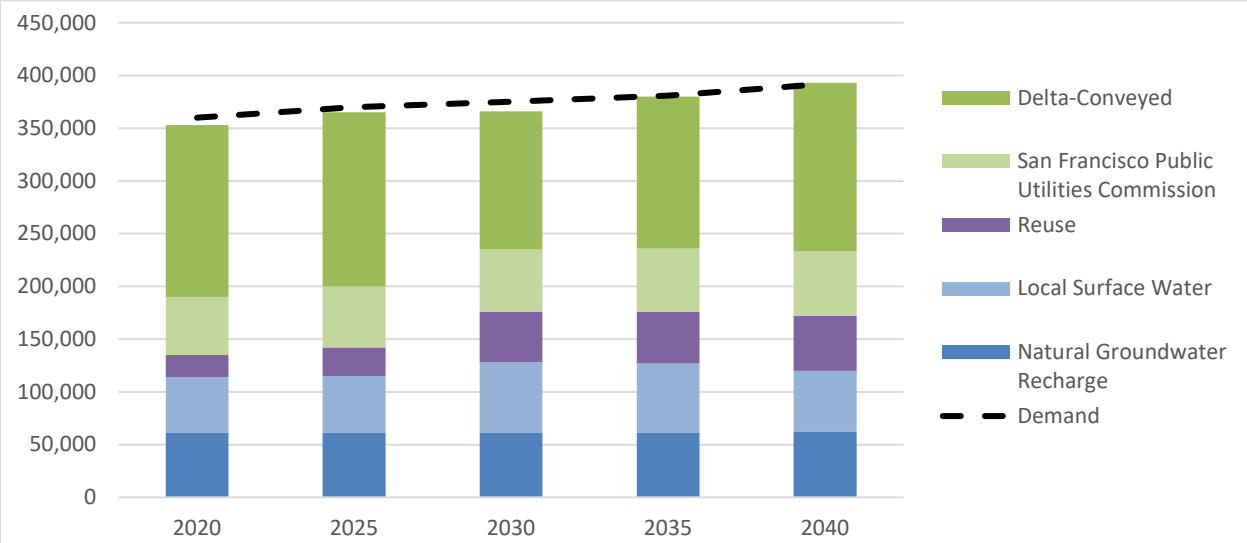


Figure 9. Average Water Supplies with Master Plan Projects

Table 4. Average Water Supplies with Master Plan Projects (AF)

Supply	2020	2025	2030	2035	2040
Natural Groundwater Recharge	61,000	61,000	61,000	61,000	62,000
Local Surface Water	53,000	54,000	67,000	66,000	58,000
Reuse	21,000	27,000	48,000	49,000	52,000
San Francisco Public Utilities Commission	55,000	58,000	59,000	60,000	61,000
Delta-Conveyed	163,000	165,000	131,000	144,000	160,000
Average Supply	354,000	365,000	365,000	380,000	392,000
Demand	360,000	370,000	375,000	381,000	392,000

Figure 10 and Table 5 show water supplies during an extended drought like the one that occurred from 1987 to 1992 with the Ensure Sustainability water supply strategy in place and the 2040 demand level. With the Ensure Sustainability Strategy in place, supplies are sufficient to meet 100 percent of demand during the first three years of drought and more than 90 percent in the second three years.

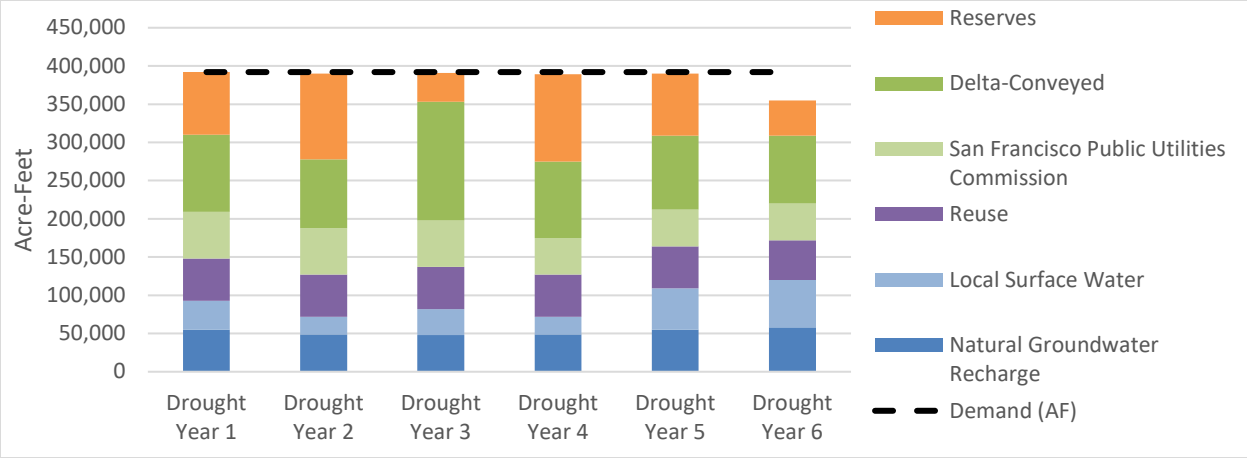


Figure 10. Water Supply Use During an Extended Drought

Table 5. Water Supply Use During an Extended Drought (AF)

Source of Supply	Drought Year 1	Drought Year 2	Drought Year 3	Drought Year 4	Drought Year 5	Drought Year 6
Natural Groundwater Recharge	55,000	49,000	48,000	49,000	55,000	58,000
Local Surface Water	38,000	23,000	34,000	23,000	54,000	62,000
Reuse	55,000	55,000	55,000	55,000	55,000	52,000
San Francisco Public Utilities Commission	61,000	61,000	61,000	48,000	48,000	48,000
Delta-Conveyed	101,000	90,000	155,000	100,000	97,000	89,000
Reserves	82,000	112,000	38,000	114,000	81,000	46,000
Total Supply	**392,000**	**392,000**	**392,000**	**390,000**	**390,000**	**354,000**
Shortfall	**0**	**0**	**0**	**-2,000**	**-2,000**	**-38,000**

Implementation of the Ensure Sustainability water supply strategy would reduce the frequency and magnitude of short-term water use reductions under 2040 demands. Figure 11 shows shortages with and without the Master Plan projects. The small blue area in Figure 11 shows that, with full implementation of all elements of the water supply strategy, short-term water use reductions would occur only three percent of the time and the maximum call for water use reductions would be 20 percent. If only baseline investments are made, illustrated by the orange area in Figure 11, the model predicts that water use reductions would occur about 40 percent of the time and the level of short-term water reductions could be as high as 50 percent. Water use reductions this high would necessitate water use restrictions and impact the local economy. Water use reductions would be needed almost half the time and in some years water supply would only be available to meet health and safety needs.

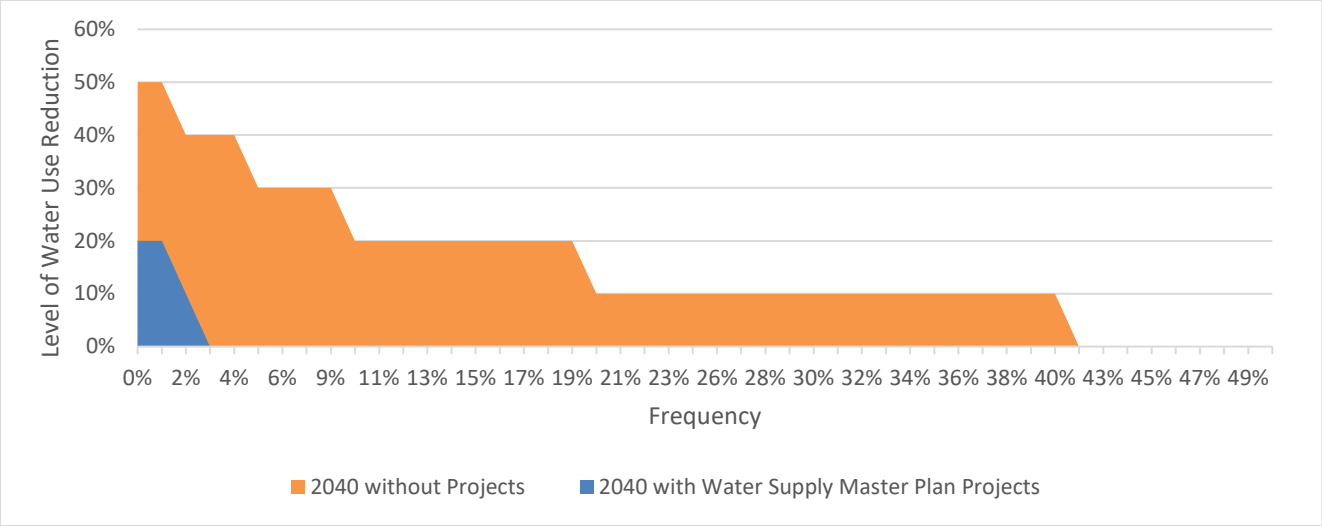


Figure 11. Water Use Reductions under Different Investment Scenarios

3.3 The Water Supply Strategy Supports Other Important Benefits

The key benefit of the Ensure Sustainability strategy is that it develops potable reuse and conservation, which are local drought-proof supplies, to achieve Valley Water's strategy to develop supplies to meet at least 80 percent of demands during drought years. The Master Plan also achieves the following other planning objectives, which are described in Appendix D:

- Maintaining Groundwater Storage: Groundwater storage is in the Normal stage of Valley Water's water shortage contingency plan in more than 95 percent of modeled years due to the combination of projects in the Master Plan. In the Llagas Subbasin, the South County Recharge project will help maintain groundwater storage.
- Securing Existing Water Supplies: The Ensure Sustainability Strategy includes implementing FAHCE to secure existing local water rights, retrofitting dams to remove operating restriction, and participating in California WaterFix to maintain existing imported water supplies.
- Maximizing Water Conservation and Water Use Efficiency: The WUE projects increase the Valley Water's water conservation saving target to 109,000 AFY by 2040 and adds stormwater capture projects. The strategy also includes increasing countywide reuse to 52,000 AFY in 2040, which exceeds Valley Water's goal of water reuse meeting at least 10 percent of countywide demand.
- Protecting Groundwater Quality: Potable reuse will increase recharge using highly purified water, which will help maintain or improve groundwater quality in northern Santa Clara County. California WaterFix will help maintain current salinity levels in imported water supplies used for groundwater recharge.
- Meeting Drinking Water Regulations: California WaterFix should help maintain current salinity levels in imported water supplies used at drinking water treatment plants. Pacheco Reservoir and Transfer-Bethany Pipeline will increase Valley Water's flexibility in where it can obtain water

from to send to treatment plants, which will help avoid water quality issues in San Luis Reservoir and Delta.

- Maximizing District Influence over Supplies and Operations: Pacheco Reservoir, Transfer-Bethany Pipeline, and South County Recharge will increase Valley Water's ability to manage variability in water supplies and respond to emergencies. Pacheco Reservoir, Transfer-Bethany Pipeline, WUE projects, and reuse will involve partnerships with other agencies, which will increase regional cooperation once partnership agreements are reached.
- Allowing for Phased Implementation of New Projects and Programs: Chapter 4 describes how the Master Plan projects and programs will be phased in over time. This will allow Valley Water to adjust to changes in demand and supply projection, as well as changes in project definitions.

The Pacheco Reservoir Expansion Project will increase storage capacity in Pacheco Reservoir from about 6,000 AF to over 140,000 AF.

- Adapting to Climate Change: All the elements of the Ensure Sustainability Strategy adapt to climate change. California WaterFix address changes in runoff patterns and sea level rise in the Delta. WUE projects will reduce demands for water. Reuse develops drought-resilient supplies that help carry us through dry periods. Pacheco Reservoir, Transfer-Bethany Pipeline, and South County Recharge add flexibility to the system to take advantage of increased storm intensity.
- Protecting and Restoring Creek, Bay, and Other Aquatic Ecosystems: The California Water Commission, which has conditionally awarded $485 million to the Pacheco Reservoir project, found that the project may benefit steelhead habitat in Pacheco Creek downstream of the reservoir.
- Fulfilling Reasonable Customer Expectations for Good Service: The Master Plan projects improve water supply reliability throughout the county.
- Providing Natural Flood Protection and/or Reduced Potential for Flood Damages: The WUE stormwater projects will keep stormwater on site and/or reduce discharges to stormwater facilities. The Pacheco Reservoir could also provide flood benefits to San Benito County by attenuating peak flows entering the reservoir and lowering water levels downstream.

Another important benefit of the Ensure Sustainability strategy is that it would reduce reliance on imported water supplies, which Valley Water measures by the percent of imported supplies in its water supply portfolio, as a result of increases in water use efficiency and conservation. A more diverse portfolio of supplies will be more resilient to risks and uncertainties, including climate change, than a portfolio with increased reliance on imported water supplies. Imported supplies are particularly vulnerable to climate change and regulatory actions like the Bay Delta Water Quality Control Plan. State policy, as stated in the Delta Reform Act of 2009 (California Water Code Section 85021), is to "*reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of*

investing in improved regional supplies, conservation, and water use efficiency. Each region that depends on water from the Delta watershed shall improve its regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts."

Figure 12 shows how the mix of countywide supplies would change between 2020 and 2040. The significant changes are in reuse and Delta-conveyed supplies. Delta-conveyed supplies decrease from 46 percent of countywide supply in 2020 to 41 percent in 2040. Reuse increases from six percent of countywide supply in 2020 to 13 percent in 2040. In addition to the seven percent increase in reuse, long-term water conservation program savings are projected to increase from about 80,000 AFY in 2020 to about 109,000 AFY in 2040.

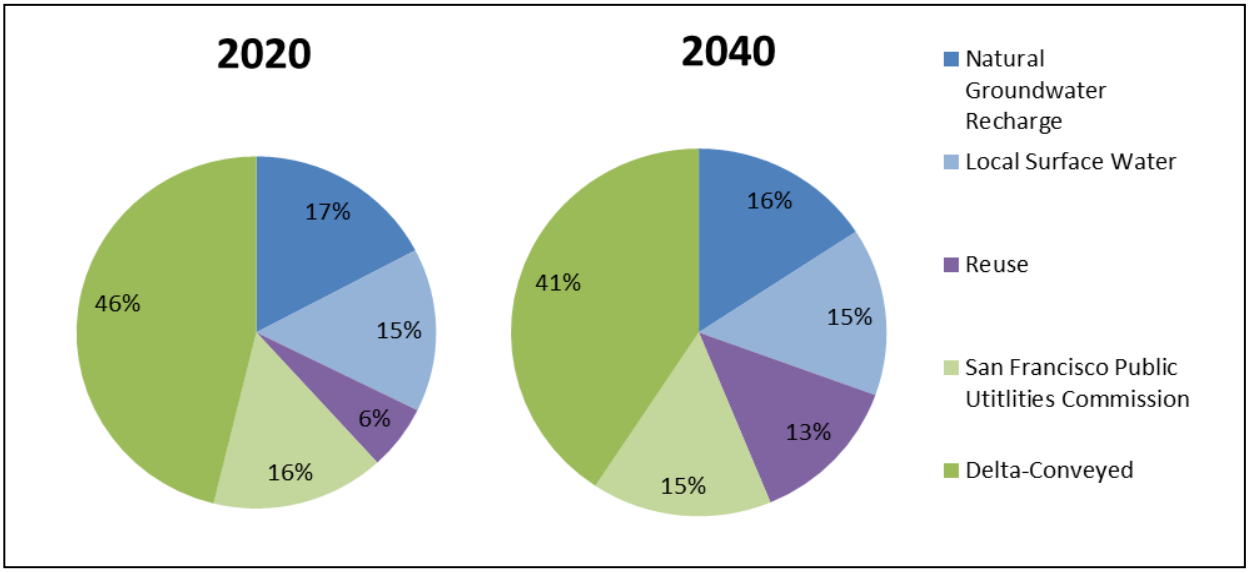


Figure 12. Change in Water Supply Mix over Time

3.4 The Ensure Sustainability Strategy is Consistent with Stakeholder Input

The Ensure Sustainability Strategy incorporates stakeholder input. Input was received through several forums, including Board meetings, stakeholder meetings, Board Advisory Committee meeting, Board Committee meetings, retailer meetings, and a voter survey. Input received through January 14, 2019 is summarized in Appendix E (January 14, 2019 District Board Agenda Package including attachments).

Stakeholders support a reliable water supply, affordable rates, and project and programs related to water conservation, water reuse, and stormwater capture. The water supply reliability level of service and Ensure Sustainability strategy balance interests in water supply reliability and impacts on rates. Additional reuse and the WUE projects are critical elements of the water supply strategy. Some of the projects in the Master Plan are not as universally supported as reuse and the WUE projects, but they address many stakeholders' interests. For example, California WaterFix is generally opposed by environmental groups. However, the project will secure Delta-conveyed water supplies at a much lower cost than potable reuse and some other projects, which addresses other stakeholders' interests related

to costs and water supply reliability. Expanded storage is favored by voters and Pacheco Reservoir can provide expanded storage. However, there is some opposition in the environmental community to new surface reservoirs.

3.5 The Ensure Sustainability Strategy Balances Risks and Costs

Valley Water evaluated the costs and risks associated with projects being considered for the Master Plan. Risks were considered in four categories – stakeholder, implementation, operations, and cost. Stakeholder risks include public perception, regulatory restrictions, and partnerships. Implementation risks include construction complexity and phasing potential. Operation risks include climate change and uncertainty in long-term operations and maintenance. Cost risks include stranded assets and financing security. In general, lower cost projects and/or local projects have lower risks than higher cost and more complex projects. The projects in the Master Plan have a balanced risk profile, with some projects considered low risk (most of the WUE projects and South County Recharge), some considered medium risk (potable reuse, Pacheco Reservoir, and Transfer-Bethany Pipeline), and some considered high risk (California WaterFix). The Risk Ranking report and additional information is included in Appendix E (January 14, 2019 District Board Agenda Package).

Valley Water also evaluated the costs and economic benefits of improved water supply reliability associated with different projects and water supply strategies (Appendix A, Cost Analysis Methodology). The Ensure Sustainability Strategy costs more than other water supply strategies, but, as discussed above, it meets multiple objectives, addresses multiple stakeholder interests, and balances risk. The economic analysis found that the water supply reliability benefits of the water supply strategy are more than the costs. The present value of the avoided water supply shortages (benefits) is about $2.5 billion and the present value cost of the Master Plan projects is about $2.1 billion, for a benefit:cost ratio of about 1.2. This calculation does not include benefits associated with ecosystem improvement, emergency storage, flood risk reduction, or water quality. Nor does it include costs associated with potential increases in greenhouse gas emissions from potable reuse and Pacheco Reservoir. Table 6 shows the reduction in the frequency and severity of shortage with the Master Plan projects and the economics associated with the water supply reliability improvements.

Table 6. Water Supply Reliability Benefits and Costs

	Without Projects	With Projects
Number of Years (out of 94) with Shortages	38	2
Maximum Shortage/Water Use Reduction	50%	20%
Present Value of Benefits (2018$)	Not applicable	$2.1 billion
Present Value of Costs (2018$)	Not applicable	$2.5 billion
Benefit:Cost Ratio	Not applicable	1.2

The estimated impacts on municipal and industrial groundwater production charges from the Master Plan in Fiscal Year 2040 are $1,116/AF in Zone W-2 (North County) and $187/AF in Zone W-5 (South County). The average annual increase in North County charges increases from about 2.6 percent to 4.6

percent. In South County, that average annual increase increases from about 4.9 percent to about 5.6 percent. This projection is based on the groundwater production charge analysis in Valley Water's Protection and Augmentation of Water Supplies 2019-2020 (Santa Clara Valley Water District, 2019), which does not include costs for the CVP portion of California WaterFix due the uncertainty with the amount and timing of costs and assumes external funding for most of the Pacheco Reservoir capital costs. Figure 13 shows the anticipated impacts of the Master Plan projects on groundwater production charges.

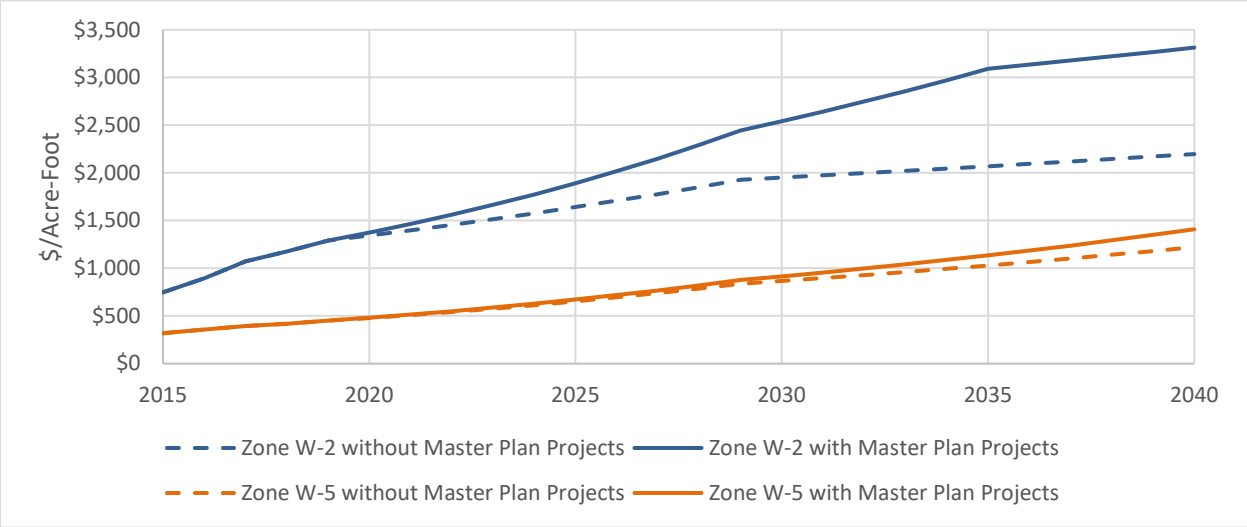


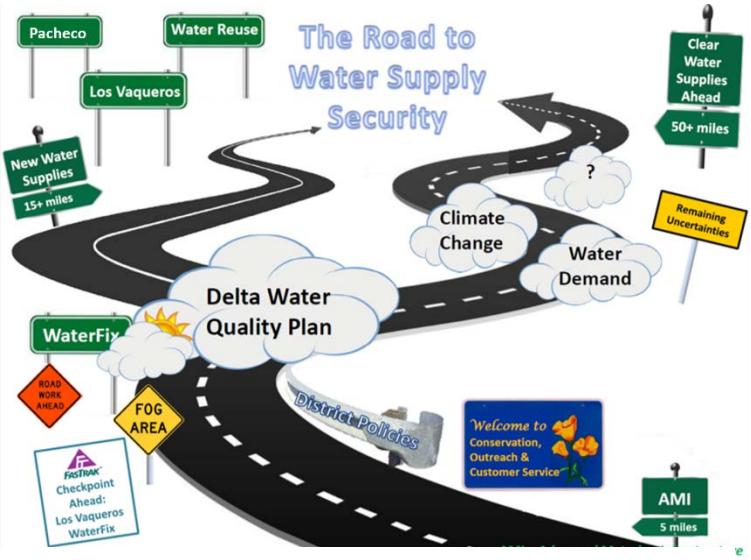
Figure 13. Municipal and Industrial Groundwater Production Charge Impacts from Master Plan

Valley Water may be able to reduce groundwater production charge impacts if the following opportunities become available in the future:

- Cities implement stormwater projects with Valley Water cost-sharing;
- Direct potable reuse is permitted and accepted by the community and regulatory agencies;
- Advanced treatment technologies become less expensive, more efficient, or both;
- Additional partners join the Pacheco Reservoir project;
- Cities and Valley Water agree on approaches for impact fees to benefit Master Plan projects;
- Projects are funded through special taxes or other funding mechanisms; and/or
- Projects are postponed because demands remain flat.

4 The Monitoring and Assessment Plan Will Help Keep Valley Water on Track

A primary purpose of the Master Plan is to inform investment decisions. Therefore, a critical piece of the plan is to monitor and report on demands, supplies, and the status of projects and programs in the Master Plan so the Valley Water Board can use that information in its annual strategic planning sessions, which inform the annual water rate setting process, Capital Improvement Program (CIP), and budget processes. Monitoring will identify where adjustments to the Master Plan might be needed to respond to changed conditions. Such adjustments could include accelerating or delaying projects due to changes in the demand trend, changing projects due to implementation challenges, adding projects due to lower than expected supply trends, etc. This chapter presents the Master Plan's Monitoring and Assessment Plan (MAP) for keeping the Ensure Sustainability Strategy on track.



The road to water supply reliability has many obstacles. The MAP will help keep Valley Water on track. Graphic courtesy of Alameda County Water District.

4.1 The Master Plan Will be Implemented over the Next 20 Years

The first part of the MAP is the planned schedule for implementation of the Master Plan projects. The schedule is based on Valley Water's current understanding of project schedules, yields, and costs. Table 7 summarizes the schedule for constructing/implementing the various projects and programs in the Master Plan. In addition, each of the projects has its own detailed project plan and is reported on at Valley Water Board committee meetings. The project summaries are in Appendix D. Significant milestones and risks and uncertainties for the individual projects and programs are discussed below.

4.1.1 California WaterFix

California WaterFix would help secure Delta-conveyed supplies. California WaterFix has been in planning for over a decade. An Environmental Impact Statement/Environmental Impact Report (EIS/EIR) has been completed on a two-tunnel project, but the project has been revised to a single tunnel and will likely require additional environmental analysis. Furthermore, the project requires several permits from the State Water Quality Control Board (State Water Board) and other resource agencies, as well

Table 7. Implementation Schedule

Project	Now – 2024	2025 – 2029	2030 – 2034	2035-2039
California WaterFix	• Permitting • Design • "Validation Action"	Construction	Construction	Operation
WUE Projects and Programs	• Continue implementing stormwater rebates and graywater program • Design and begin implementing AMI program • Work with jurisdictions to adopt Model Ordinance • Develop Ag Land Recharge pilot project • Monitor stormwater capture projects	• Continue implementing stormwater rebates, graywater program, AMI • Support implementation of Model Ordinance • Develop leak repair incentive program • Design Ag Land Recharge and stormwater capture project(s)	• Continue implementing stormwater rebates, graywater program, AMI • Support implementation of Model Ordinance • Implement leak repair incentive program • Design and construct Ag Land Recharge and stormwater capture project(s)	• Continue implementing stormwater rebates, graywater program, AMI, leak repair incentive program, and Ag Land Recharge and stormwater capture project(s) • Support implementation of Model Ordinance • Construct stormwater capture project(s)
Reuse	• Complete Countywide Reuse Plan • MOU(s) with wastewater provider (s) • Select P3 entity • EIR • Design	Construction	Operation	Operation
Pacheco Reservoir Expansion	• EIR/Feasibility Study • Permitting • Planning and Design	Construction	Operation	Operation
Transfer Bethany Pipeline	• EIR/Feasibility Study • Permitting • Planning, Design, and Construction	Operation	Operation	Operation
South County Recharge		Planning, Design, and Permitting	Construction	Operation

as resolution of various legal challenges to the project. In addition, the benefits of the project to Valley Water's CVP supplies is unclear, because insufficient CVP participation in the project has been secured and the project may only be a State project.

Near-term milestones for the project include obtaining a Change in Point of Diversion Permit from the State Water Board and resolving DWR's' validation action regarding DWR's authority to, among other things issue revenue bonds to finance the planning, design, construction, and other capital costs of California WaterFix.

Other projects that could potentially help secure Delta-conveyed supplies include Sites Reservoir, long-term transfers of SWP contract supplies, and other long-term transfer and exchange agreements.

4.1.2 Water Use Efficiency Projects and Programs

The WUE package of water conservation and stormwater projects and programs will reduce water demands by about 10,000 AFY and increase natural groundwater recharge by about 1,000 AFY when fully implemented by the end of the planning horizon. Three of the projects – rain garden rebates, rain barrel/cistern rebates, and graywater program expansion have already been implemented. Implementation plans and potential issues for the remaining elements are summarized below.

- Advanced Metering Infrastructure (AMI): Valley Water is currently partnering with the Bay Area Water Supply and Conservation Agency on a study that will identify each water retailer's metering and related system, data gaps, and potential for collaborative procurement for AMI as an option for the region. This research, along with lessons learned from the pilot studies funded by Valley Water's Water Conservation Research Grant Program (funding through Safe, Clean Water), will help inform the direction of a future AMI Program, so that it can be as cost effective and as impactful as possible. Valley Water is planning to complete program development, in collaboration with retailers, before the end of 2019. The key issue that needs to be resolved is investor-owned utility concerns about cost distribution.
- Leak Repair Incentives: Valley Water will implement a customer-side leak repair incentive program after studying AMI results, in coordination with the water retailers.
- Model Water Efficiency New Development Ordinance: The Model Water Efficiency New Development Ordinance has been finalized. The ordinance has the following main requirements on new development:
    - Require hot water recirculation for single-family development;
    - Pre-plumb all new single-family development for graywater collection, treatment, and redistribution;

Graywater from clothes washers can be used to water fruit trees, shrubs, vines, and some vegetables

- Pre-plumb all new multi-family and non-residential development for alternative water sources;
- Mandate recycled water connections for common areas in HOA developments; and
- Outlaw the sale of non-compliant fixtures.

Valley Water will begin working with all the county's jurisdictions on adoption in 2019. Valley Water's role will be to encourage ordinance adoption and implementation and provide technical assistance. The challenge with getting jurisdictions to adopt the policy will primarily be concerns about imposing additional requirements on new development. This concern would be offset in jurisdictions that are developing climate action plans, because model ordinance implementation would reduce energy use and greenhouse gas emissions.

- Flood-Managed Aquifer Recharge (Flood-MAR): Valley Water is currently developing a work plan to develop a pilot program for capturing and recharging stormwater on open space, a process referred to as Flood-MAR. The pilot program will help identify and develop management strategies for collaborating with private land owners and other agencies, assessing appropriate cost-sharing amounts, and evaluating the groundwater benefit of Flood-MAR to Santa Clara County residents. The work plan is scheduled for completion in 2019.
- Centralized Stormwater Capture Projects: WUE includes development of two centralized stormwater capture projects in northern Santa Clara County. Centralized stormwater capture projects capture stormwater from multiple parcels for recharge in a single location and/or are municipal projects, including "green streets" projects. . The Santa Clara Basin Storm Water Resources Plan completed in December 2018 identified potential projects throughout northern Santa Clara County. These projects would likely be partnerships with other jurisdictions and require outside funding, so their schedules are yet to be determined. Valley Water will continue to track project opportunities through our participation in the Santa Clara Valley Urban Runoff Pollution Prevention Program. In addition, Valley Water is continuing planning for the Upper Penitencia Creek flood protection project, which could include some stormwater retention components.

Green infrastructure and stormwater capture can provide multiple benefits, including improved water quality, reduced runoff, and groundwater recharge.

The greatest risks and uncertainties with water conservation programs is the level of active participation by residents, businesses, and governments. This risk is mitigated by the fact that new technologies and standards provide for currently unforeseen opportunities. The greatest risk for implementing stormwater projects is finding willing partners for projects that are cost-effective for Valley Water's water supply program. This risk is somewhat mitigated by regulatory requirements for stormwater management and green infrastructure that will provide water supply benefits.

4.1.3 Potable Reuse Program

The Ensure Sustainability Strategy includes 24,000 AFY of reuse, in addition to the reuse planned in the retailers' UWMPs, to increase drought supplies, adapt to climate change, and manage risks to imported water supplies. The placeholder project is the potable reuse at the Los Gatos Ponds. Some of the challenges and uncertainties with the project are securing a source of wastewater, reverse osmosis concentrate management, using a public-private partnership (P3) procurement for the first time, timing of regulations for direct potable reuse, and determining the mix of non-potable and potable reuse that best meets countywide interests. Near-term milestones include executing an agreement (or agreements) with a wastewater provider (or providers), selecting a P3 entity, and preparing a draft EIR.

Reverse osmosis is one step in the advanced treatment process for purified wastewater

Valley Water is completing a Countywide Water Reuse Master Plan (Reuse Plan) that will identify a preferred mix of non-potable and potable reuse, reverse osmosis concentrate management strategies, and different alternatives for achieving the 24,000 AFY of reuse as part of the Ensure Sustainability Strategy. Other projects that could help achieve the 24,000 AFY of reuse include groundwater recharge at alternative locations than Los Gatos Ponds, groundwater injection wells, augmenting drinking water treatment supplies with purified water (direct potable reuse), expanded non-potable reuse, Regional Desalination/Brackish Water Treatment, and the Refinery Recycled Water Exchange.

4.1.4 Pacheco Reservoir

The expanded Pacheco Reservoir may optimize the use of existing supplies by increasing in-county storage and the amount of existing supplies Valley Water uses. Project planning is underway, but several significant milestones need to be achieved before January 1, 2022 in order to remain eligible for State funding. These milestones include completing a feasibility study, preparing a draft EIR, and determining non-State funding. Risks and uncertainties include potentially significant environmental and cultural resource impacts, streamflow requirements for fisheries, and water rights.

Alternative projects that could provide similar benefits as Pacheco Reservoir include expanding existing in-county reservoirs, Lexington Pipeline, and Los Vaqueros Reservoir Expansion.

4.1.5 Transfer-Bethany Pipeline

Transfer-Bethany Pipeline, which is one element of the larger Los Vaqueros Reservoir Expansion Projection, would optimize the use of existing supplies and increase operational flexibility by enabling Valley Water to move water from Contra Costa Water District's intakes in the Delta to Valley Water's system without relying on south-of-Delta CVP and SWP pumps. This project is subject to the same State requirements for funding as Pacheco, but the Los Vaqueros feasibility and environmental documents are

nearly complete. However, the project currently involves 9 local agency partners, so project financing and operating agreements will be complex and water rights changes will be required.

Lexington Pipeline would serve as the alternative project, it would increase operational flexibility but not provide alternative Delta-conveyed supply diversion points.

4.1.6 South County Recharge

South County recharge optimizes the use of existing supplies by increasing groundwater recharge capacity in the Llagas Subbasin. Planning for this project is currently scheduled to begin closer to 2030, so there are no near-term milestones. Alternative projects could include expanding local reservoirs or a South County Water Treatment Plant.

One option for increasing South County recharge is to extend the Madrone Pipeline to Morgan Hill's Butterfield Channel

4.1.7 Other Plans and Projects

Valley Water has multiple plans and programs that support implementation of the Ensure Sustainability Strategy and Master Plan, including the Groundwater Management Plan, Asset Management Plan, Recycled and Purified Water Program, Imported Water Program, and Dam Safety Program. Implementing these plans and programs is critical to securing existing supplies and infrastructure consistent with the Ensure Sustainability Strategy. In addition, the following activities support implementation of the Master Plan:

- Demand Projection Update: Valley Water is reviewing its current demand projection and anticipates updating the projection in 2020 to update the demand modeling methodology and to account for actual water use following the 2012 to 2016 drought.
- Groundwater Recharge Assessment: This special study will identify strengths, weakness, opportunities, and threats associated with Valley Water's groundwater recharge program. It will identify potential future projects for maintaining or increasing recharge capacity under a changed climate, increased regulations on instream operations, and potential Sustainable Groundwater Management Act requirements. Projects could include additional offstream recharge ponds, additional stormwater capture projects, and Flood-Managed Aquifer Recharge.
- Ongoing Project Participation: Valley Water will continue to track and participate in projects that could serve as alternatives to the Master Plan projects, including Los Vaqueros Reservoir Expansion, Refinery Recycled Water Exchange, Regional Desalination/Brackish Water Treatment, Sites Reservoir, and long-term transfers of imported water contracts.

4.2 Other Policies, Plans, and Programs May Affect Implementation

The second step of the MAP is to manage unknowns and risks through regular monitoring and assessment. Master Plan monitoring and assessment will build on regular project reports and the

annual water supply outlook and look at how different deviations from the plan affect the long-term water supply reliability outlook. Staff will also evaluate how changing external factors such as changes in policy, regulations, and scientific understanding affect the long-term water supply reliability outlook. This section describes some of the activities, beyond monitoring the Master Plan projects and alternative projects.

4.2.1 Making Conservation a Way of Life

The California legislature and governor passed Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman) into law in 2018 to improve water conservation and drought planning. Pursuant to the legislation, DWR and the State Water Resources Control Board (State Water Board) are developing new standards for indoor residential water use; outdoor residential water use; commercial, industrial, and institutional water use for landscape irrigation with dedicated meters; and water loss. Retail urban water supplies will be required to stay within annual water budgets based on these standards for their service areas. The methodologies for determining the annual water budgets are still being developed, so it is unclear how the standards may affect Valley Water's long-term water supply reliability outlook. Valley Water already has aggressive water conservation targets of 99,000 AFY of savings by 2030 and 109,000 AFY of savings by 2040. However, the new standards could further drive down water use and reduce or postpone the need for some Master Plan projects.

4.2.2 Fisheries and Aquatic Habitat Collaborative Effort

The Fisheries and Aquatic Habitat Collaborative Effort (FAHCE) was established to resolve a 1996 complaint with the State Water Resources Control Board over Valley Water's use of water rights in the Stevens Creek, Coyote Creek and Guadalupe River watersheds. In 2003, the Valley Water initialed a Settlement Agreement regarding water rights with the Guadalupe-Coyote Resource Conservation District, the California Department of Fish and Wildlife, U. S. Fish and Wildlife Service and National Marine Fisheries Service and a group of nongovernmental organizations, including Trout Unlimited, Pacific Coast Federation of Fishermen's Associations, California Trout, Urban Creeks Council and the Northern California Council of Federation of Fly Fishers. The Settlement Agreement provides a roadmap for resolving the water rights complaint and improving habitat conditions for fish in the Guadalupe River, Coyote Creek, and Stevens Creek watersheds through:

Stevens Creek after restoration efforts.

- Modifications to reservoir operations to provide instream flows;
- Restoration measures to improve habitat conditions and provide fish passage; and
- Monitoring and adaptive management.

Valley Water is currently preparing a Fish Habitat Restoration Plan and EIR. These will be used to request water rights modifications and obtain resource agency permits. Then, Valley Water can request that the water rights complaints be dismissed.

The adaptive management element of FAHCE could result in future changes to Valley Water water supply operations, but the nature and impact of those changes are yet to be determined.

4.2.3 Bay-Delta Water Quality Control Plan

The State Water Board recently amended the Bay-Delta Water Quality Control Plan (Bay-Delta Plan) to set flow and water quality objectives for the San Joaquin River and its major salmon bearing tributaries. The amendments could significantly reduce SFPUC's water supply, including deliveries to customers in Santa Clara County, especially during droughts. The flow requirements will not be implemented until the Sacramento River and Delta parts of the Bay-Delta Plan are completed and an implementation program is developed. The Sacramento River and Delta updates could impose even more stringent flow requirements on the Sacramento River and its tributaries and affect Valley Water's Delta-conveyed supplies.

The Delta holds historic, cultural, economic, and environmental significance

Valley Water filed a lawsuit in January challenging the flow requirements on the San Joaquin River, asking the court to determine whether the state has taken proper action to require increased flows for fish and wildlife in the San Joaquin, Tuolumne, Stanislaus and Merced rivers. While the complaint moves through the courts, Valley Water will continue to negotiate with state officials and other agencies to address our interests, especially retaining sufficient water supply during droughts and supporting effective measures to sustain healthy native fish populations in the Delta and its tributaries.

4.2.4 SFPUC Contracts with San Jose and Santa Clara

The cities of San Jose and Santa Clara have interruptible contracts with SFPUC. To make San Jose and Santa Clara permanent customers, SFPUC needs to secure sufficient supplies to meet the cities' contract amounts. Valley Water and SFPUC are partners in several efforts that could enable SFPUC to grant San Jose and Santa Clara permanent contract status, including Los Vaqueros Reservoir Expansion Project, Regional Desalination/Brackish Water Treatment, and a pre-feasibility study on potable reuse. Valley Water will continue to collaborate with SFPUC and the cities on efforts to make the cities permanent SFPUC customers.

4.2.5 Land Use Planning

Land use decisions can have significant impacts on demands and water supplies. Decisions to build up rather than out can maintain natural groundwater recharge and reduce per person water use. Decisions to require water use efficiency measures beyond those mandated in state law can also reduce water use and encourage the use of alternative water supplies.

Enforcing requirements for recycled water connections and water-efficient landscapes can reduce demands on potable supplies. Aggressive implementation of stormwater requirements can increase groundwater recharge, as well as provide water quality, flood protection, and environmental benefits. In addition to working with land use agencies to implement the WUE Model Water Efficient New Development Ordinance, Valley Water is developing a plan to better coordinate with jurisdictions on land use and water supply planning.

Low impact development includes sustainable land use practices

4.2.6 Climate Change

The impacts of climate change are already being felt in the Bay Area and northern California and these changes are projected to increase significantly in the coming decades. Valley Water needs to continue to monitor and improve understanding of climate change to better incorporate climate change impacts into modeling of future conditions. Valley Water will continue to review and incorporate California Department of Water Resources projections when considering the effects on imported water supplies, which are currently based on near-term climate and growth conditions. Additionally, since Valley Water's local surface water supply projections are based on historic hydrology and demand projections do not utilize a temperature factor, future evaluations would benefit from incorporating additional climate change science and projections. Valley Water will consider these areas and others for more refined analyses of climate change impacts as critical components to the MAP and future Master Plan updates.

4.3 Annual Reporting Will Help Keep the Ensure Sustainability Strategy on Track

The third step of the MAP is to prepare at least annual reports on Master Plan implementation that consider the following elements:

- Demand trends based on actual use, climate change science, and policy and regulatory changes;
- Supply trends based on actual supplies, climate change science, policy and regulatory changes;
- Project status, including current scope, schedule, and budget;
- Funding;
- Risk and uncertainties; and
- Stakeholder input.

The Valley Water Board of Directors sets policy to provide Silicon Valley safe, clean water for a healthy life, environment, and

The annual reports will include recommended changes to the Master Plan projects, as appropriate, and how those changes would affect water supply reliability, costs and groundwater production charges, risks, and relationships between projects. The annual reports will be presented to the Valley Water Board of Directors in the summer or fall, so the report can help inform Board's annual strategic planning process and subsequent budget and water rates processes.

The implementation schedule in Section 4.1 will be updated at least annually based on Board direction. This annual cycle will enable Valley Water to adjust the Master Plan projects based on changes to assumptions, funding, supplies, demands, and infrastructure. It is anticipated that major updates to the Master Plan will occur about every five years, to precede the Urban Water Management Plan updates. The annual reviews and periodic updates will help ensure the Master Plan is living document and continues to provide a framework for efficient and effective investment in water supply reliability in an environment of uncertainty.

Valley Water cannot forecast the future and identify a specific response for every potential water supply scenario. The path we are on today will look different in the future, near and distant. A balanced, diverse, and sustainable water supply will help us adapt to future challenges. A strong MAP will help us stay on top of challenges and uncertainties and our options for managing them.

5 References

Ackerly, David, Andrew Jones, Mark Stacey, Bruce Riordan. (University of California, Berkeley). 2018. *San Francisco Bay Area Summary Report.* California's Fourth Climate Change Assessment. Publication number: CCCA4-SUM-2018-005. Available at: http://www.climateassessment.ca.gov/regions/docs/20190116-SanFranciscoBayArea.pdf [Accessed 26 Feb. 2019].

Association of Bay Area Governments (2013). *Projections 2013*. Plan Bay Area.

Bureau of Economic Analysis, United States Department of Commerce (2018). *Gross Domestic Product by Metropolitan Area, 2017*. [online] Available at: https://www.bea.gov/system/files/2018-09/gdp_metro0918_0.pdf [Accessed 26 Feb. 2019].

Santa Clara Valley Water District (2019). *Protection and Augmentation of Water Supplies 2019-2020*. 48th Annual Report. [online] Available at: https://www.valleywater.org/sites/default/files/PAWS%202019.pdf [Accessed 26 Feb. 2019].

HANDOUT: AGENDA ITEM 5.1

Santa Clara Valley Water District
Draft Water Supply Master Plan 2040

Appendices

A. Cost Analysis Methodologies
B. Demand Projection Methodology
C. Model Description and Assumptions
D. Project List
E. Agenda Package
F. Planning Objectives

The Master Plan appendices can be found on our website at:

https://www.valleywater.org/your-water/water-supply-planning/water-supply-master-plan

- Select the second bulleted link “Draft Water Supply master Plan 2040: appendices only.”

Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686
Phone: (408) 265-2600
Fax: (408) 266-0271
www.valleywater.org

HANDOUT: AGENDA ITEM 5.2

From: Dhruv Khanna <dhruvkhanna2002@yahoo.com>
Sent: Monday, July 01, 2019 7:48 AM
To: Glenna Brambill <GBrambill@valleywater.org>; Dave Vanni <davevanni@gmail.com>; Jan Garrod <jan@garrodfarms.com>; Sherrie Kennedy <shersfarm@hughes.net>; Russ Bonino <ljbfarms@gmail.com>; Board of Directors <board@valleywater.org>
Cc: Jess Brown <jessbrown@sbcglobal.net>; Paul Mirassou <btfarms08@gmail.com>; Chris Borello <chris.borello@me.com>; Tim Chiala <tim.chiala@gcfarms.com>; Nick Dorcich <ndorcich@gmail.com>
Subject: Funding sources for Open Space Credit etc

Honorable Water District Officials and Fellow Members of the Ag Water Advisory Committee:

I respectfully submit that our Water District's efforts to obtain additional funds for the Open Space Credit and otherwise for limiting future ground water production charge increases should **include seeking modifications to California State Law**. The lobbying process for modifying state law is not easy and is usually ***a multi-year process***. It is my personal opinion that our Water District staff has not been sufficiently active in this area, and I find that frustrating and flabbergasting. We must collectively get past finger-pointing, blame-shifting and excuses-making. Let's collectively (with Water District Staff taking the lead) get our acts together and lobby Sacramento for changes that will abate the relentless water rate increases we are looking at for ground water production charges for well water from wells we have dug, maintain and operate at our own considerable expense and risk. This is something we farmers and our water district should be able to agree upon without any rancor or hesitation.

Thank you,

Dhruv Khanna, for Kirigin Cellars, one of California's oldest wineries