



# Santa Clara Valley Water District

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## BOARD AGENDA MEMORANDUM

### **SUBJECT:**

Water Supply Master Plan Monitoring and Assessment Program Update 2021.

### **RECOMMENDATION:**

Receive and discuss information on the annual Water Supply Master Plan Monitoring and Assessment Program evaluation.

### **SUMMARY:**

The Water Supply Master Plan 2040 (Master Plan) Monitoring and Assessment Program (MAP) provides Santa Clara Valley Water District (Valley Water) a mechanism to evaluate and report to the Board how new water supply and demand data, modeling, and project information may influence Valley Water's future water supply reliability. The goal of MAP is to ensure the Board has the necessary information to make investment and policy decisions.

The MAP 2020 report provided updated demands that consider the 2012-2016 drought rebound and new growth and development information. Forecasted demands are lower than had been modeled in the Master Plan and are not expected to exceed historic water use, even when considering the potential impacts of climate change. However, Valley Water is still considering investing in new water supplies to mitigate potential impacts of climate change and future regulations on existing supplies. This MAP 2021 memorandum expands upon the MAP 2020 analysis by summarizing Valley Water's evaluation of how different projects may help ensure Valley Water maintains a reliable water supply into the future considering future climate, regulations, and updated project design and operation information. In addition, this memorandum provides updated project cost information and findings from an updated project risk assessment.

### **Water Supply Project and Portfolio Evaluation**

Valley Water collaborated with internal and external stakeholders to maintain an accurate understanding of the existing system and forecasted demands, and to support the development of new water supply projects. Updated system and project information is then included in Valley Water's planning model to evaluate how different projects could provide Valley Water a resilient and reliable water supply in the future.

The project and portfolio evaluation assumes that Valley Water's conservation program and current Capital Improvement Plan (CIP) projects would be fully implemented between 2030 and 2040. The

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conservation program includes achieving 110 thousand acre-feet (TAF) of conservation by 2040. Valley Water is on track for meeting the 2040 conservation program goal and recently completed a Conservation Strategic Plan to ensure the success continues. Key CIP projects include the seismic dam retrofits, Vasona Pump Plant Upgrade (Vasona), and Rinconada Water Treatment Plant Reliability Improvement (Rinconada).

To address potential supply shortages in the future from climate and regulatory changes, staff evaluated Master Plan projects that Valley Water is actively pursuing to achieve the Master Plan “Ensure Sustainability” strategy or allow for adjustments of the Master Plan investment approach considering future climate, demand, and regulatory uncertainties. Below is a list of evaluated projects, those that are bolded are included in Valley Water’s current groundwater production rate forecast per the Master Plan specified:

- 1) Delta Conveyance Project (DCP)**
- 2) Direct Potable Reuse (DPR)
- 3) Lexington Pipeline
- 4) Los Vaqueros Reservoir Expansion (LVE)**
- 5) Pacheco Reservoir Expansion Project (Pacheco)**
- 6) Indirect Potable Reuse at Los Gatos Ponds (IPR)**
- 7) Refinery Recycled Water Exchange Project (RRWE)
- 8) Sites Reservoir (Sites)

Attachment 1 summarizes the preliminary cost estimates for the above projects and provides brief project descriptions. IPR and DPR was evaluated considering plant sizes of 11.2 TAF and 24 TAF. LVE was evaluated assuming investing in only expanded conveyance (e.g., Transfer Bethany Pipeline) or also 30 TAF storage while Pacheco Reservoir Expansion was evaluated assuming a 55 TAF share of storage. Sites was evaluated with a 3.2% participation. Compared to the MAP 2020 analysis, the RRWE plant capacity was reduced since one of the oil refineries the project requires has shifted operations, thereby reducing its water demands from the RRWE plant.

All active projects were included in the planning model evaluation except for the Delta Conveyance Project (DCP). The DCP is in early stages and there is insufficient information on proposed operations to model and quantitatively evaluate water supply benefits to Valley Water. Staff evaluated the benefits of all the other projects and project portfolios under a range of climate change scenarios. This memo presents a subset of those individual projects and portfolio combinations. Portfolio combinations presented in the memo were selected with a focus on combinations of projects that are a new supply with either additional storage or conveyance. A baseline scenario was evaluated in which Valley Water only invests in the conservation program and key CIP projects (seismic retrofits, Vasona, and Rinconada). A comparison with this baseline can be used to determine the impacts from a specific project or portfolio of projects.

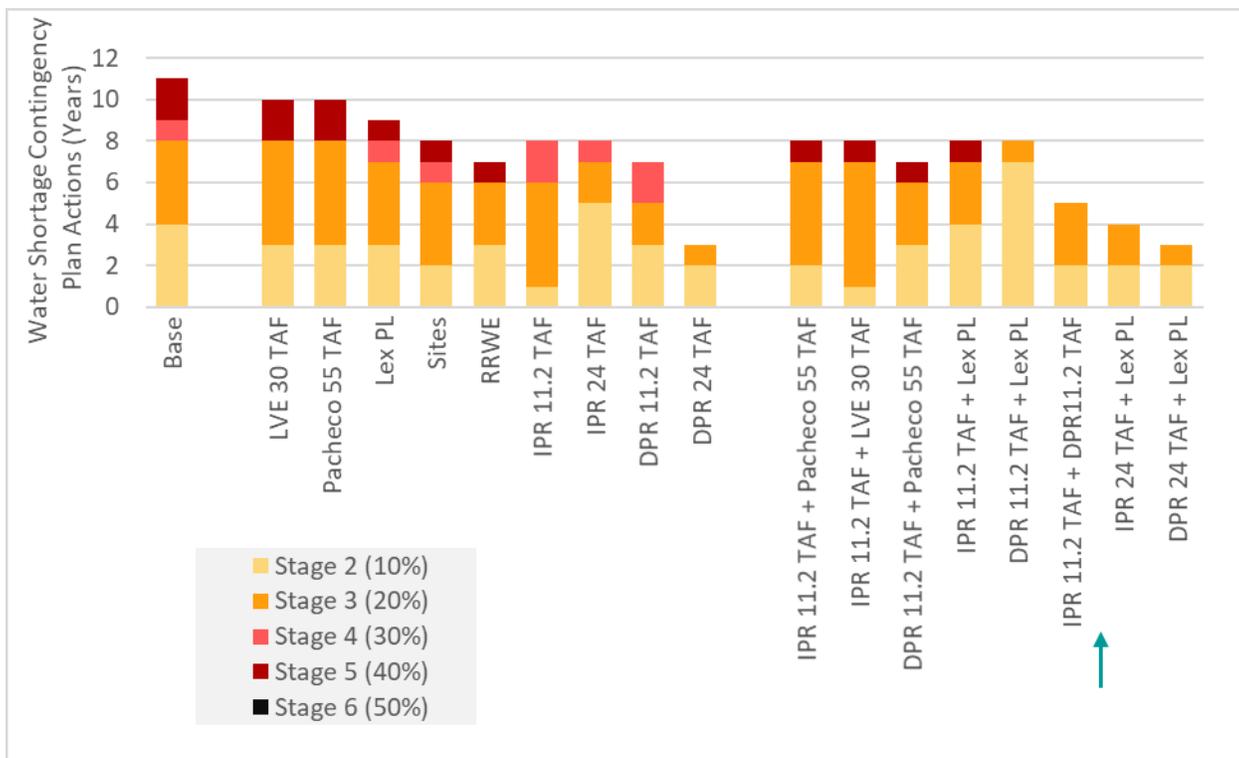
Valley Water worked with Dr. Edward Maurer, a researcher from Santa Clara University who is a climate change expert and hydrologist, to evaluate the impacts of climate change on local reservoir inflows and evaporation, precipitation, temperature, and demands for integration into Valley Water’s planning model. Valley Water used empirical analysis and published studies from the California Department of Water Resources (DWR) to develop an imported water scenario that accounts for

potential future climate change and regulations. A summary of the key findings related to climate change are in Attachment 2 and below summarizes the findings on how projects and portfolios could help mitigate climate change impacts on water supply reliability.

Water Supply Analysis Results

The water supply modeling indicates that locally developed and renewable water supplies are the most drought and climate resilient projects and portfolios (Figure 1). Lexington Pipeline, which allows Valley Water to make better use of its local Lexington Reservoir supplies, coupled with direct or indirect potable reuse could help Valley Water maintain a reliable water supply in the face of climate change and could also help maintain storage in the face of potentially decreasing imported water supplies. Both potable reuse and Lexington Pipeline help increase local groundwater recharge and free up imported water supplies to be put in regional storage facilities that would have otherwise been used for in-county recharge.

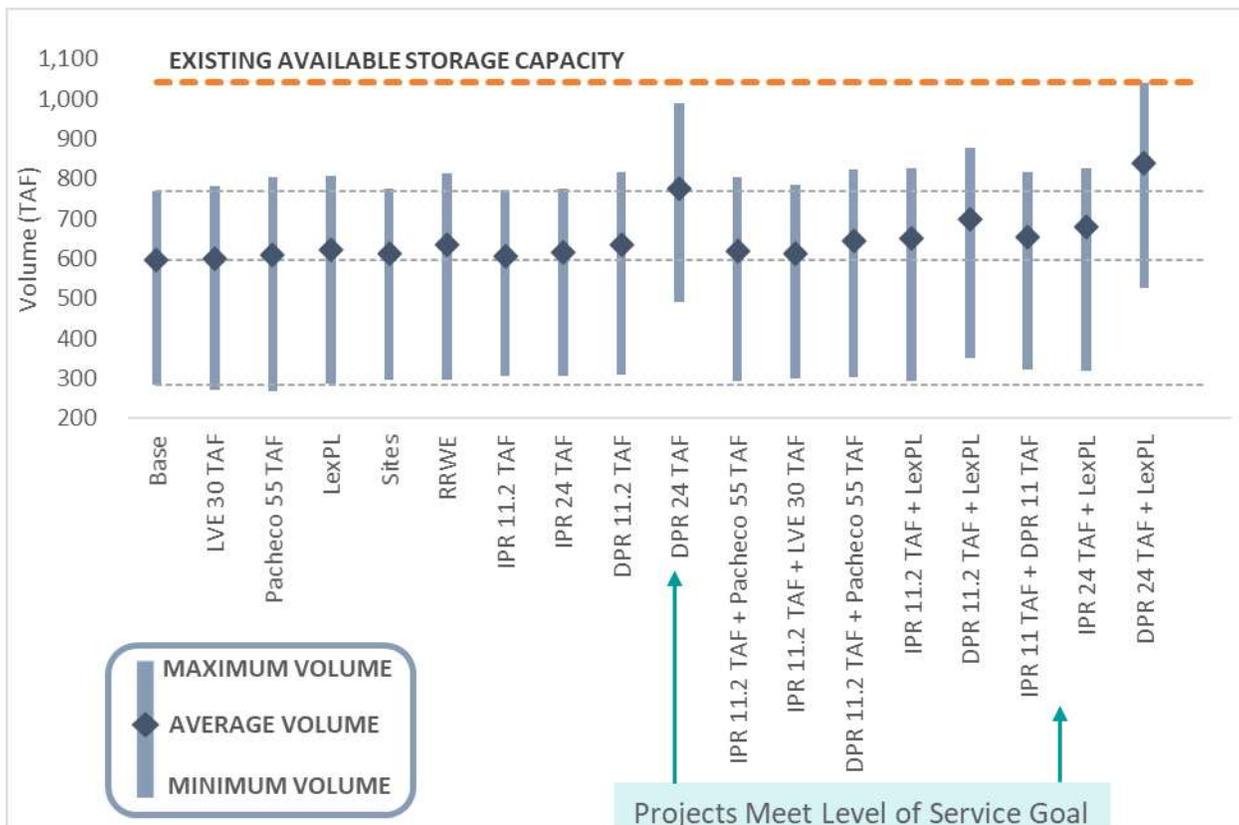
**Figure 1. Water supply reliability results for year 2045 under a median climate change scenario. Bars shown indicated the number and severity of water shortage contingency plan (WSCP) actions. For example, stage 2 equals a 10% water use reduction per the WSCP. Volumes associated with storage projects are their assumed storage capacities. Volumes associated with the potable reuse projects are assumed plant production capacity. “Lex PL” is Lexington Pipeline.**



The analysis also indicates that with climate change and future regulations, Valley Water may have difficulty in filling its existing storage (Figure 2). Modeling indicates that the “put” capacities in the Semitropic Storage Bank limit operational flexibility to fill the bank in wet years. Since climate change

is expected to bring infrequent very wet years, Valley Water is evaluating whether diversifying its storage portfolio could help increase Valley Water’s ability to maximize the utilization of its storage under future conditions. Having a storage portfolio that maximizes “put” and “take” capacities can allow Valley Water to store more water during the wet periods without increasing actual storage capacity and “take” more water during droughts. Table 1 summarizes different storage options Valley Water is considering to diversify its storage portfolio. While the list in Table 1 is not comprehensive since not all potential storage projects are sufficiently developed, it shows the breadth of options being considered.

**Figure 2. Modeled use of storage compared to existing storage capacity for the year 2045 under a median climate change scenario. Volumes associated with storage projects are the assumed storage capacities. Volumes associated with the potable reuse projects are assumed plant production capacity. “Lex PL” is Lexington Pipeline.**



**Table 1. Storage Diversification Options. The Semitropic Bank is our existing regional storage that could be diversified using one or more of the example banking projects listed below.**

Banking Project	2021\$/AF Storage Space	Max Annual Put	Max Annual Take	Percent Loss	Key Constraint
Semitropic Bank (350 TAF)	\$250	32 TAF	31.5-78 TAF	10%, 1 time	SWP exchange capacity + KCWA approval <sup>1</sup>
Typical New Groundwater Bank (225 TAF)	\$770	60 TAF	40 TAF	10%, 1 time	Regulatory Approval + Water Quality
Los Vaqueros (30 TAF)	\$8,250	30 TAF	30 TAF	6%, annually	Available conveyance capacity
Pacheco (55 TAF) <sup>3</sup>	\$18,800	55 TAF	55 TAF	5%, annually	San Luis Reservoir temperature

<sup>1</sup>Kern County Water Agency (KCWA) needs to approve exchange requests and the State Water Project (SWP) needs to have the capacity to provide Valley Water the exchanged supply.

<sup>2</sup>Central Valley Project (CVP) exchange approval needs to be obtained before completing a groundwater banking project that uses CVP supplies and infrastructure.

<sup>3</sup>Assumes 35% of the reservoir is shared with partner(s) and 25% of the reservoir is for ecological benefits as required by the Water Storage and Infrastructure (WSIP) grant award.

<sup>4</sup>Preliminary cost estimates that could change materially pending ongoing project development.

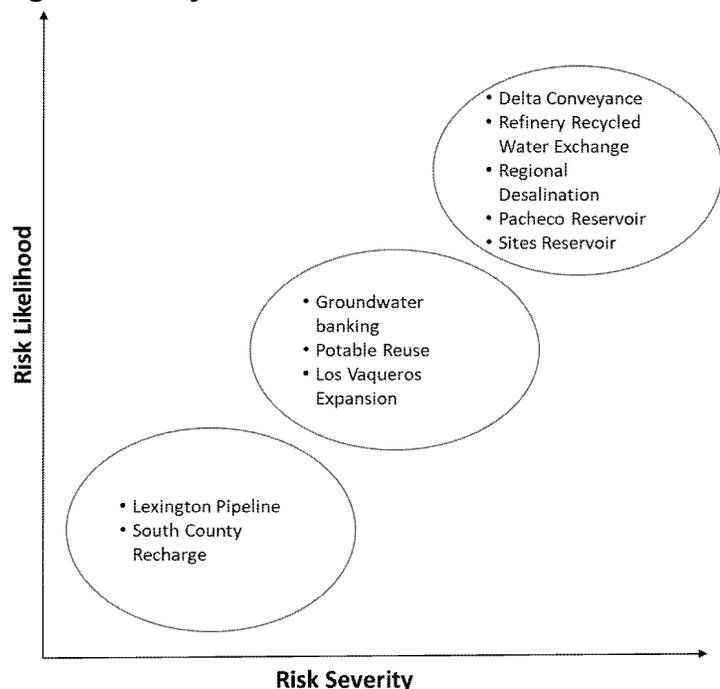
Valley Water is working with external partners on developing the Delta Conveyance Project. Currently, modeling results are not available to quantitatively evaluate how the project may support water supply reliability and how it could influence Valley Water’s ability to exercise its storage. However, it is expected to provide increased imported water deliveries, especially during wet years. This project could help improve our ability to exercise Valley Water’s storage capacity, especially if Valley Water diversifies its storage portfolio to provide for greater “put” capacities.

**Project Risk Assessment**

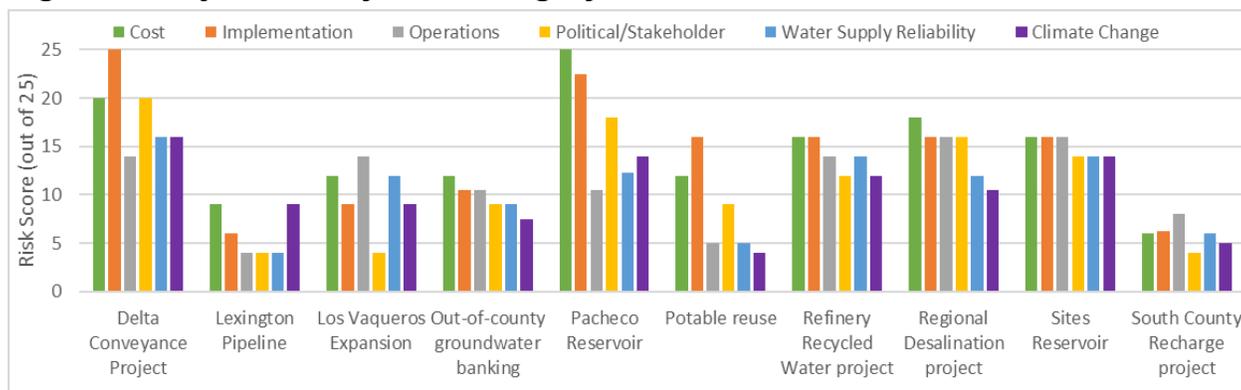
The goal of the project risk assessment was to have a diverse team of experts independently evaluate project risks that could reduce project success, including risks associated with a project’s ability to be completed on time and provide the needed benefits throughout its lifecycle. Ten units from across Valley Water’s business areas participated in the risk assessment. Each unit rated the likelihood and severity between 1-5 (higher rating representing greater risk) of each risk category impacting each project’s success in providing needed benefits. Staff then compiled all risk ratings to evaluate total risk (Figure 3) and risk by category (Figure 4). The results of the risk assessment indicate that larger infrastructure projects have greater risk based on cost, political, and implementation criteria. In addition, projects which are dependent on imported water were found to have higher risk in the water supply reliability and climate change risk categories. An important exception is Los Vaqueros Reservoir Expansion, which is a large infrastructure project that relies on imported supplies which may be impacted by climate change but is rated as a moderate risk. The projects found to have the highest risk include the Delta Conveyance Project, Refinery Recycled Water Exchange, Pacheco Reservoir, Regional Desalination, and Sites Reservoir. See Attachment 3 for more details on the risk assessment findings. Overall, the risk assessment helps identify project

risk areas so that Valley Water can work to mitigate the risks where feasible.

**Figure 3. Project Risk Matrix**



**Figure 4. Project Risk by Risk Category.**



**Next Steps**

Valley Water will continue to evaluate the impacts of climate change and future regulatory changes on existing supplies, proposed projects, and forecasted demands. Analyses will also be informed by feedback from the Board on projects and project combinations. Staff will continue to actively participate in water supply projects that could support Valley Water’s “Ensure Sustainability” strategy and regularly evaluate how new project information impacts Valley Water’s interests and needs from the project. A MAP update is brought to the Board as needed and at least annually.

**FINANCIAL IMPACT:**

Depending on the participation level and ongoing project development, the financial impact of the recommended projects in the Water Supply Master Plan (Delta Conveyance Project, Los Vaqueros Reservoir Project, Pacheco Reservoir Expansion, and Indirect Potable Reuse via a Public-Private Partnership) will be reflected in the CIP in the years the Board makes decisions related to these projects. The financial impact of projects that are not currently incorporated in the CIP (i.e., direct potable reuse, refinery recycled water exchange and Sites reservoir) will be evaluated as part of the annual MAP process.

**CEQA:**

The recommended action does not constitute a project under CEQA because it does not have a potential for resulting in direct or reasonably foreseeable indirect physical change in the environment.

**ATTACHMENTS:**

- Attachment 1: Project Costs
- Attachment 2: Climate Change Assessment
- Attachment 3: Project Risk Assessment Report
- \*Attachment 4: PowerPoint

**UNCLASSIFIED MANAGER:**

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