Santa Clara Valley Water District

File No.: 24-0497

Agenda Date: 6/25/2024
Item No.: *3.4.

BOARD AGENDA MEMORANDUM

Government Code § 84308 Applies: Yes ☐ No ☒
(If "YES" Complete Attachment A - Gov. Code § 84308)

SUBJECT:
Receive an Update and Provide Feedback on Santa Clara Valley Water District's Water Supply Master Plan 2050; Consider and Approve May 17, 2024 Water Supply and Demand Management Committee Recommendation to Set a Water Conservation Goal of 126,000 Acre-Feet Per Year by 2050; Consider and Approve March 27, 2024 Recycled Water Committee Recommendation to Set Potable Reuse Goal of 24,000 Acre-Feet Per Year by 2035.

RECOMMENDATION:

A. Consider and approve the May 17, 2024 Recommendation of the Water Supply and Demand Management Committee to set water conservation goal of 126,000 acre-feet per year by 2050 in the Water Supply Master Plan 2050;
B. Consider and approve the March 27, 2024 Recommendation of the Recycled Water Committee to set a potable reuse goal of 24,000 acre-feet per year by 2035 as well as long-term vision to maximize water reuse in the County in the Water Supply Master Plan 2050, including additional potable and non-potable reuse, desalination, stormwater capture, and other alternative water sources;
C. Provide feedback and direction on portfolio analysis and three water supply strategies for meeting water supply needs; and
D. Provide feedback and direction on proposed adaptive management framework.

SUMMARY:
The Water Supply Master Plan (WSMP) is Santa Clara Valley Water District's (Valley Water) guiding document for long-term water supply investments to ensure water supply reliability for Santa Clara County. Updated approximately every five years, this long-range plan assesses projected future county-wide demands and evaluates and recommends water supply and infrastructure projects to meet those demands to achieve Valley Water's level of service goal through the planning horizon. Valley Water's level of service goal, as established in Board Ends Policy 2, is to "Meet 100 percent of annual water demand during non-drought years and at least 80 percent of demand in drought years."

Valley Water is working on developing the WSMP 2050. At the January 9, 2024 Board of Directors (Board) meeting, staff presented second update on the development of the WSMP 2050, including projected water shortage under four future supply and demand conditions, preliminary portfolio

analysis, and example portfolios. Since then, staff has been focusing on additional portfolio analysis and project evaluation. This memorandum summarizes the progress on those efforts and includes project evaluation that details each project's benefits and risks/challenges; cost analysis for individual projects and portfolios; representative portfolios under three themes that present different strategies to address future water shortages; and a proposed adaptive management approach to support making incremental investment decisions as projects develop. In addition, it includes recommended water conservation and potable reuse goals for Board approval.

Water Supply Needs and Challenges
Valley Water operates a complex and interconnected water supply system to conjunctively manage supplies from surface water (imported and local) and groundwater to meet county-wide demand, now and in the future. With conjunctive management and continued investment, Valley Water's existing system has proven flexible and reliable in meeting demands in most years, but extended droughts continue to be the greatest challenge. According to the WSMP analyses, if relying only on existing supplies and infrastructure, Valley Water will experience water shortages during the later years of an extended drought beginning in 2035, mostly driven by changing demands, regulations, and climate change. In 2050, the average shortage over a six-year drought could be as much as 76,000 acre-feet per year (AFY), depending on the projected demand and imported water supply conditions. These shortages are large and already account for meeting drought calls and long-term conservation goals. Therefore, Valley Water needs to invest in new projects to address those shortages to ensure long-term water supply reliability for Santa Clara County.

In addition to future water shortages, Valley Water's existing water supply system is aging and in need of maintenance and upgrading. At the same time, water infrastructure projects are becoming increasingly complex and expensive, which affects affordability and water rates. Therefore, Valley Water's WSMP 2050 aims to develop an investment strategy that balances providing safe clean water, reliability, adaptability, and affordability.

Project Evaluation
To address future water supply needs and other challenges, Valley Water evaluated nearly 20 projects. The project types and major projects within each group are listed below.

- Alternative Supply
    - San José Direct Potable Reuse (DPR)
    - Palo Alto Potable Reuse
    - Local Seawater Desalination
    - Refinery Recycled Water Exchange
- Surface Supply
    - Delta Conveyance Project (DCP)
    - Sites Reservoir
- Storage
    - Pacheco Reservoir Expansion (Pacheco)
    - Los Vaqueros Expansion (LVE)
    - B.F. Sisk Dam Raise (Sisk)
    - Out of County Groundwater Banking (GW Bank)

- South County Recharge
    - San Pedro Ponds Improvement
    - Coyote Valley Recharge Pond
    - Madrone Channel Expansion

The projects were evaluated both quantitatively (supply benefit and cost) and qualitatively, to provide a comprehensive understanding of their benefits and risks. The evaluation started with a detailed analysis of the water supply benefit and cost of each project, followed by a qualitative assessment of each project's reliability in providing planned benefits, likelihood of success, environmental impacts, jurisdiction and partnership, and public acceptance. The environmental impacts of major projects are based on their published Environmental Impact Reports, which detail their impacts on natural and/or cultural resources and other aspects of the environment. Each project's benefits to Valley Water's water supply reliability as well as associated risks and challenges based on the evaluation criteria are summarized in Attachment 1.

The project evaluation confirms that while all projects are beneficial to Valley Water's long-term water supply reliability, no single project can meet all our future needs and each project has risks and challenges. Some projects provide needed supply during droughts but are costly; others are lower in cost but are high risk or do not contribute significantly to drought reliability; and yet others require agreements with partners and therefore their success remains out of Valley Water's direct control. Furthermore, many projects are in the planning phase and still evolving, adding further uncertainty on their costs, benefits, and risks. Portfolios of projects that complement each other could provide a balanced, diverse, and sustainable water supply to address future needs and challenges.

Valley Water also developed water conservation and reuse goals for inclusion in the plan, as they are important components in our effort to address future shortages.

- **2050 Conservation Goal**
  The Water Supply and Demand Management Committee recommends the Board adopt 126,000 AFY as the 2050 water conservation goal, which is considered ambitious but implementable, and balances benefits with affordability concerns (Attachment 2). This water conservation goal recognizes that Santa Clara County is already very water efficient and complements the State's "Making Water Conservation a Way of Life" regulation. It allows Valley Water to stay at the forefront of conservation with sufficient feasible program expansion options supported by community interest and reduces the need to invest in additional new supplies and/or storage. Meeting long-term conservation goals throughout the planning horizon is factored into baseline assumptions in the analysis. In addition, Valley Water will continue to implement the 'no-regrets' package of conservation and stormwater capture projects identified in the WSMP 2040.

- **Potable Reuse Goal**
  Potable reuse is a locally controlled and drought-resilient supply that is effective in mitigating drought risks. The Recycled Water Committee recommends a goal of 24,000 AFY of potable reuse by 2035, which can be achieved with a project in collaboration with the Cities of San José and Santa Clara. In an effort to explore additional potable reuse, the Committee also

recommends including a long-term vision to maximize water reuse in the county. This long-term vision includes additional potable and non-potable reuse, desalination, stormwater capture, and other alternative water sources. (Attachment 3). The inclusion of a 2035 goal with the long-term vision promotes a phased approach that accounts for uncertainty with future demand and wastewater availability while balancing affordability and risk of overinvestment.

Project Cost Analysis
Cost is one of the most important factors when developing a recommended investment strategy because of its impact on water rates and affordability. Cost analysis for water infrastructure projects typically includes multiple metrics to provide a complete picture of their financial implications. Valley Water's cost analysis was performed at the project and portfolio levels. For each project, the cost analysis includes total lifecycle cost and unit cost estimates. For each portfolio, the cost analysis includes total lifecycle cost, water rate impacts, and the cost of shortage. The cost of shortage is defined as the dollar amount that water users would be willing to pay to avoid water shortage, which is calculated based on the economic theory of demand and relies on price elasticities and forecasted demands (among other variables). The cost metrics are calculated using similar approaches to other agencies and are based on inputs from the WSMP expert panel.

The lifecycle cost includes capital and annual operations and maintenance costs over a project's useful service life with financing. The useful service life is assumed to be the time before a project incurs any significant repair/replacement costs - 30 years for purified water, desalination, and local pipeline projects; and 50 years for storage and other projects. The unit cost calculation is handled separately for supply and storage projects because they function very differently. For supply projects, the unit cost is calculated using present values of lifecycle cost relative to the anticipated average annual supply benefit (Table 1). For storage projects, a "storage capacity cost" or cost per acre-foot of storage capacity is calculated (Table 2) because of the challenges in estimating their annual water supply yields. Therefore, unit costs can be used to compare projects within the same group, but not for comparing supply projects with storage projects. All costs are represented in 2023 dollars. These cost calculations may be updated in future updates. The portfolio cost analysis is discussed in a later section, and cost of shortage analysis will be included in a future Board update.

Table 1 Cost of Major Supply Projects (in 2023 Dollars)

Project	Average Annual Supply (AF)	Capital Cost (Million)	Annual O&M (Million)	Present Value (PV) Lifecycle Cost (Million)	Lifecycle Cost PV/ Yield PV ($/AF)	Annualized Unit Cost ($/AF)
Palo Alto Potable Reuse	8,000	$780	$13	$1,570	$10,200	$9,000
San José Direct Potable Reuse	24,000	$2,140	$30	$2,610	$6,400	$5,000
Local Seawater Desalination	24,000	$2,140	$30	$2,610	$6,400	$5,000
Refinery Recycled Water Exchange	8,000	$250	$9	$430	$2,800	$2,500
Delta Conveyance Project	14,000	$650	$2	$720	$2,700	$1,800
Sites Reservoir	5,000	$140	$0.6	$130	$1,200	$1,000

Table 2 Cost of Major Storage Projects (in 2023 Dollars)

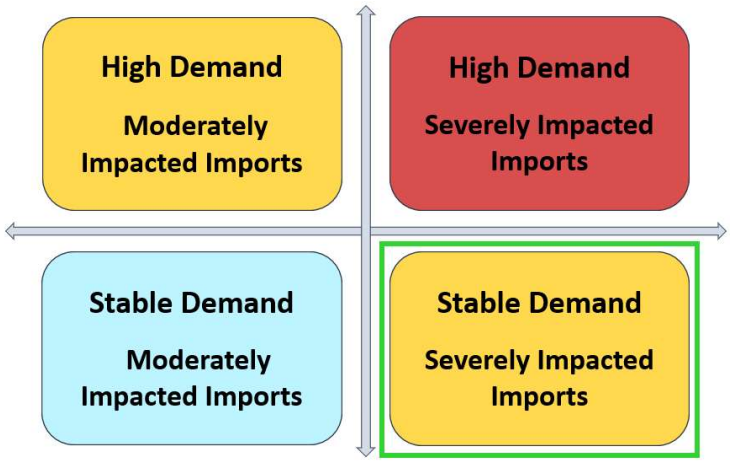
Project	Storage (AF)	Capital Cost (Million)	Annual O&M (Million)	PV Lifecycle Cost (Million)	Lifecycle Cost PV/ Storage Capacity ($/AF)
Pacheco	140,000	$2,210	$2.5	$1,590	$11,400
B.F. Sisk Dam Raise	60,000	$440	$1.8	$470	$7,900
Los Vaqueros Expansion	30,000	$260	$3.2	$350	$11,700
Groundwater Banking	350,000[1]	$280	$2.8	$350	$1,000

[1] Different levels of Groundwater Banking were used in the portfolio analysis.

Overall Water Supply Strategy

As presented in the January Board update, portfolio analyses are used to identify the combinations of projects that may be needed to achieve water supply reliability under four future supply and demand conditions (Figure 1) based on different combinations of imported water supplies (moderately or severely impacted) and demand (stable or high).

Figure 1 Four Future Conditions for Planning



The portfolio analysis for this board update was focused on a future with stable demand and severely reduced imported water supplies. The portfolios evaluated for this condition also work for the best-case condition (stable demand and moderately impacted imports), generally perform similarly to another middle-of-road condition (high demand and moderately impacted imports), and serve as the foundation for developing portfolios for the worst-case condition (high demand and severely reduced imported supply). Given these similarities, this memorandum summarizes water supply portfolios for the stable demand/severely reduced imported water supply condition. Additional projects needed to address the worst-case future condition with high demand and severely reduced imports will be included in a future update.

With the high number of potential projects, there are many combinations and strategies to achieve long-term water supply reliability, depending on different considerations and factors. The development of portfolios involved extensive water supply modeling to ensure that potential portfolios address projected shortages.

To help outline investment options and present tradeoffs, potential investment strategies were developed based on three themes - lower cost, local control, and diversified. Under each strategy, multiple portfolios can meet future water supply needs. Based on the project evaluation and discussions with both internal and external experts, one representative portfolio for each strategy was selected for this presentation and summarized in Table 3, along with the total lifecycle cost. Additional portfolios that would address projected shortages are provided in Attachment 4.

Table 3 Multiple Strategies for Water Supply Reliability

Strategies	Projects[1]	Portfolio Cost[2] (Billion)
Lower Cost	San José Direct Potable Reuse, DCP, Sisk, Groundwater Banking (250,000 AF), South County Recharge	**$4.0**
Local Control	San José Direct Potable Reuse, Palo Alto Potable Reuse, Pacheco without Partners, Groundwater Banking (150,000 AF), South County Recharge	**$5.9**
Diversified	San José Direct Potable Reuse, DCP, Pacheco with Partners, LVE, Sisk, Groundwater Banking (350,000 AF), South County Recharge	**$5.5**

[1] Conservation is factored in the baseline condition.
[2] Portfolio cost includes the sum of the present value total cost for each project.

These three potential strategies represent different approaches to water supply reliability, but each comes with tradeoffs:

- **Lower Cost** - Focuses on affordability and minimizing costs, with a mix of supply and storage projects. The strategy provides drought-resilient supply through potable reuse, diversifies existing storage, and secures existing imported supply through DCP. However, it has high risks, as all four major projects require partnership and institutional agreements to be successful.

- **Local Control** - Focuses on projects within Santa Clara County which Valley Water has more control over. The strategy provides drought-resilient supply through potable reuse, diversifies existing storage, provides emergency storage, and reduces reliance on imported supply. However, it has the highest cost, as it includes the three most expensive projects being considered (two potable reuse projects and Pacheco).

- **Diversified** - Focuses on diversifying the existing system with a mix of local and imported supplies as well as storage projects. The diversified strategy, which is most closely aligned with the FY 2024-25 rate-setting portfolio, provides a similar variety of benefits as the other two strategies but builds in more resiliency and redundancy to help reduce the county's exposure to risk and uncertainty, including the risk of any one investment not performing up to expectations. However, it has a relatively high cost and more institutional complexity since it includes more projects.

All three strategies include Direct Potable Reuse in San José, emphasizing the importance of having drought-resilient local supplies in the long-term strategy. This project is also needed in nearly all other portfolios in the Attachment 4. It should also be noted that all strategies require Valley Water to either maintain existing level of storage or further diversify and develop additional storage.

As part of each portfolio evaluation, rate impacts for each portfolio were analyzed. The adopted FY 2024-25 water rates (commonly referred to as groundwater production charges), as presented to the

Board in January, April and adopted in May 2024, most closely align with the Diversified portfolio. The Diversified portfolio includes an expanded investment in Groundwater Banking (350,000 AF) and higher Delta Conveyance Project (DCP) costs than are included in the FY 2024-25 rate-setting portfolio. Results are summarized in Table 4 below.

Table 4 Water Rate Impact Comparison Between Strategies
Translation of portfolio costs to North County Zone W-2 Municipal & Industrial rate ($/AF), or average monthly impact to an average household[1]

Strategy	FY 26 to FY 30	FY 31 to FY 35	FY 36 to FY 40	FY 41 to FY 45	FY 46 to FY 50
FY 2024-25 Adopted Rates & PAWS Report[2]	*$2,985 / AF or $102.81 / month*	*$4,786 / AF or $164.82 / month*	*$7,385 / AF or $254.35 / month*	*$7,956 / AF or $273.99 / month*	*$7,956 / AF or $273.99 / month*
Lower Cost	$2,866 / AF or $98.71 / month	$4,296 / AF or $147.96 / month	$6,581 / AF or $226.65 / month	$7,068 / AF or $243.42 / month	$7,068 / AF or $243.42 / month
Local Control	$3,359 / AF or $115.70 / month	$5,627 / AF or $193.80 / month	$8,134 / AF or $280.14 / month	$8,731 / AF or $300.69 / month	$8,835 / AF or $304.28 / month
Diversified	$3,100 / AF or $106.75 / month	$5,153 / AF or $177.45 / month	$7,686 / AF or $264.71 / month	$8,344 / AF or $287.37 / month	$8,377 / AF or $288.51 / month

[1] For purposes of this analysis, an average household is assumed to use 15 hundred cubic feet, or 0.413 acre-feet, of water per month.
[2] PAWS Report: Annual Protection and Augmentation of Water Supplies Report, February 2024. Available online at <https://www.valleywater.org/>.

South County Strategy
South County residents, businesses, and agriculture rely almost entirely on groundwater for water supply. Valley Water actively manages the groundwater basins to ensure continued sustainable supplies and takes appropriate action to protect groundwater-dependent communities such as prioritizing South County recharge during droughts. Groundwater recharge ponds are essential for long-term reliability and have played a critical role in drought recovery. With "weather whiplash" (frequent shifts between extremely wet and dry years) becoming more common and the high local reliance on groundwater, there is a need for additional recharge capacity in South County.

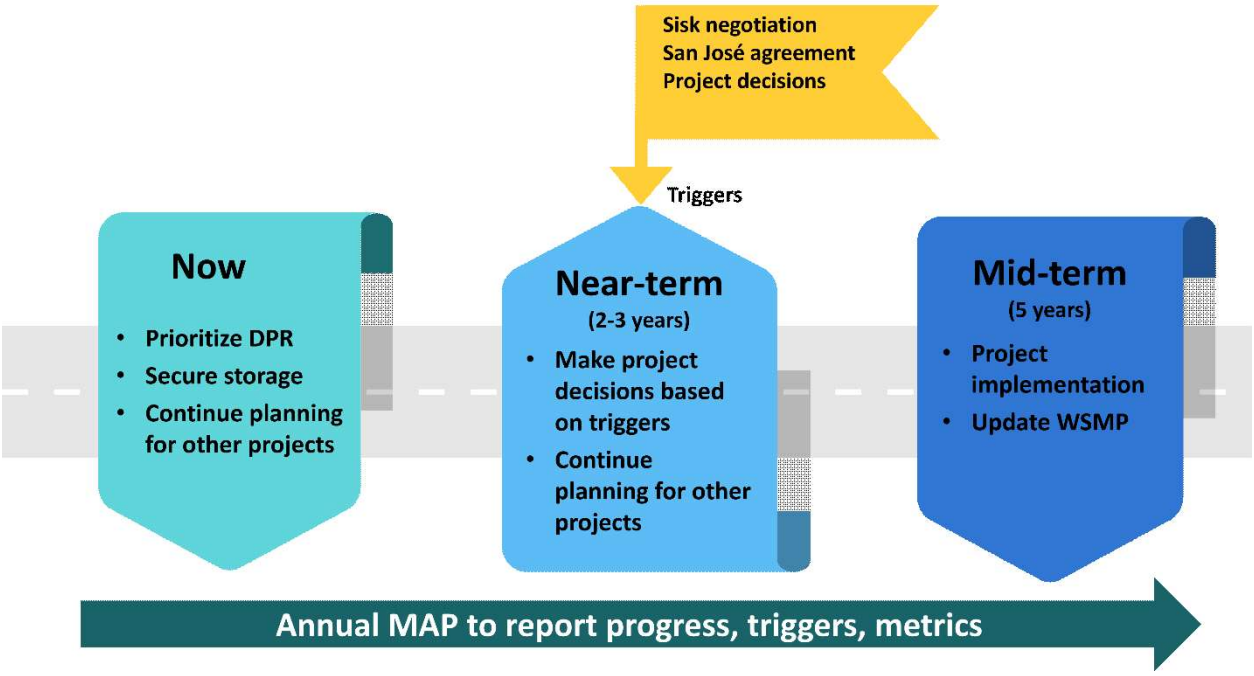
In this plan, several recharge projects in the South County are being evaluated, including expansion of the Madrone Channel, a new recharge pond in the Coyote Valley, San Pedro Ponds Improvement Project, and Agricultural Land Recharge (FloodMAR). In addition, Valley Water recently worked with the South County partner agencies to complete the 2024 update to the South County Recycled Water Master Plan to identify opportunities for additional water reuse.

Adaptive Management Framework
Portfolio analysis suggests that there are different ways to achieve future water supply reliability, each with tradeoffs and risks and challenges. Because many WSMP projects are still in the planning phase and will evolve, it is hard to predict which will ultimately be successful. Uncertainty with

forecasted future supply and demand conditions further challenges decision-making. Planning under such deep uncertainty requires an adaptive management approach to provide the Board with flexibility and the ability to make incremental investment decisions and refine them over time, based on evolving information and actual conditions. Incremental decisions based on actual conditions will help reduce the risk of over- or under-investing.

The adaptive framework is intended to define a consistent, stepwise process of making project and program investment decisions. The framework includes a roadmap and annual reporting. The roadmap outlines near- and mid-term actions and defines triggers and conditions for project decisions, and the annual reporting tracks project progress and provides up-to-date information to help inform decision-making. A preliminary conceptual roadmap is presented in Figure 2.

Figure 2 Proposed Roadmap for Adaptive Management



With this adaptive framework, a critical component is reporting through the annual Monitoring and Assessment Program (MAP). A standard MAP report will be devised to include key elements of the WSMP, including progress on projects, conditions of triggers and indicators, and whether any adjustments are recommended. The timing of the MAP will be aligned with the annual CIP Five-Year Plan and Water Rate-Setting Cycle to support related decision-making.

Some example triggers and indicators that will guide as to whether to stay the course or pivot to different pathways include:

- Negotiations and agreements with other agencies (i.e., Sisk Dam Raise Project or direct potable reuse facility with the Cities of San José and Santa Clara)
- Timing of upcoming project decisions
- Groundwater bank negotiations

- Annual water use
- Annual supply
- Conservation measures (water savings, program participation)
- Imported water allocations
- Growth trend/demand

In the next few years, major decisions will come up for several projects. Through this adaptive management framework, the Board will have multiple opportunities along each project's trajectory to make informed decisions on investments. It also allows the WSMP to be closely linked to the annual CIP and rate-setting processes, fulfilling its role as the guiding document for long-term investment strategy.

Outreach Efforts
Stakeholder engagement is an important component of the WSMP 2050 development process and will be carried out throughout the plan development. In January 2024, staff presented major milestones and progress to date at the quarterly Water Retailer meeting and Water Commission meeting. A similar presentation was given to the Environmental and Water Resources Committee in April 2024. In addition to Board and committee meetings, Valley Water continues to use the WSMP webpage (<https://www.valleywater.org/your-water/water-supply-planning/water-supply-master-plan>), stakeholder email list, blogs, social media, communication newsletter and other channels as ongoing opportunities to provide updates and engage the public and stakeholders.

Valley Water convened an expert panel to support WSMP analyses and are continuing to engage with them through the entire process.

Next Steps
Based on Board feedback and direction, Staff will finalize the analysis and roadmap and return to the Board for another update in the Fall. Staff will also start to draft the plan.

ENVIRONMENTAL JUSTICE AND EQUITY IMPACT:
There are no environmental justice and equity impacts associated with this item.

FINANCIAL IMPACT:
There is no financial impact associated with this item.

CEQA:
The recommended actions do not constitute a project under CEQA because they do not have the potential for resulting in direct or reasonably foreseeable indirect physical change in the environment.

ATTACHMENTS:
Attachment 1: Project Evaluation Summary

Attachment 2: 2050 Conservation Goal
Attachment 3: Potable Reuse Goal
Attachment 4: Additional Water Supply Portfolios
Attachment 5: PowerPoint
*Handout 3.4-A: R. Norton
*Handout 3.4-B: K. Irvin
*Handout 3.4-C: J. Kuhl
*Handout 3.4-D: J. Kuhl
*Handout 3.4-E: iBMR 24-0006
*Handout 3.4-F: iBMR 24-0007

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