



Santa Clara Valley Water District

File No.: 16-0415

Agenda Date: 4/10/2018

Item No.: 5.1.

BOARD AGENDA MEMORANDUM

SUBJECT:

Water Supply Master Plan Update.

RECOMMENDATION:

- A. Receive and discuss information on alternative water supply strategies;
- B. Receive and discuss stakeholder input on water supply projects and alternative water supply strategies; and
- C. Receive and discuss preliminary cost of shortage analysis as it pertains to the District's water supply reliability level of service goal.

SUMMARY:

The Water Supply Master Plan (Master Plan) is the District's strategy for providing a reliable and sustainable water supply in a cost-effective manner. It describes the new water supply investments the District is planning to make, the anticipated schedule, and the associated costs and benefits. The Board last received information on the Master Plan update process at its September 19, 2017 meeting. This memorandum provides information on how staff has incorporated recent Board actions into its Master Plan analysis, summarizes alternative water supply strategies, presents stakeholder input on water supply projects and alternative water supply strategies, and describes the results of staff's preliminary cost of shortage analysis.

A key finding of staff's analysis is that the projects the Board recently approved to proceed to the planning stage (i.e. Water Supply Master Plan No Regrets Package, California Water Fix, and up to 24,000 acre-feet per year of potable reuse at Los Gatos Ponds) appear to be sufficient to meet the water supply reliability level of service goal. Staff used an interim level of service goal of meeting 85 percent of demands during droughts for the analysis presented in this memorandum.

Updated Water Supply Outlook with Recent Board Actions

The Board approved beginning planning for the "No Regrets" package of water conservation and stormwater projects on September 19, 2017. These projects are designed to reduce water demands by about 10,000 acre-feet per year (AFY) and increase natural groundwater recharge by about 1,000 AFY. The Board also agreed to consider a lower level of service than the current goal of meeting 90

percent of demands during droughts and directed staff to provide more information on different levels of service. The goal of meeting 90 percent of demands during droughts is equivalent to requiring no greater than a 10 percent demand reduction during droughts.

On October 17, 2017, the Board conditionally approved participation in California WaterFix, with the goal of offsetting a reduction of about 41,000 AFY of Delta-conveyed imported water supplies. On December 12, 2017, the Board also approved pursuing a public-private partnership to develop up to 24,000 AFY of potable reuse capacity using the Los Gatos Ponds. Staff analyzed the effect of these Board-approved projects, along with additional recharge in the Llagas Groundwater Subbasin that groundwater modeling indicates is needed to meet future demands, on water supply reliability. As shown in Table 1, the projects that are approved for planning are sufficient to achieve the interim water supply reliability level of service goal of meeting 100 percent of demands in normal years and at least 85 percent of demands in drought years.

Note that in all of the analyses presented in this memorandum, model runs were conducted over 94 years of hydrology, so that historic wet and dry cycles could be replayed for the purposes of examining project or scenario performance.

Table 1. Water Supply Outlook

Scenario	2040 Demands (AFY)	2040 Maximum Drought Shortage (in AF with percent of normal year demands)	District Lifecycle Cost (Present Value, 2017)
Base Case - No Action	402,000	187,000 (50%)	\$0
Approved for Planning - No Regrets, California WaterFix*, Los Gatos Potable Reuse, and Llagas Subbasin Recharge	392,000	56,000 (15%)	\$2.0 billion

*California WaterFix participation was conditionally approved.

Alternative Scenarios

Staff developed and evaluated alternative water supply strategy scenarios that also meet the interim level of service goal with different combinations of projects. The alternative water supply scenarios were developed to:

- show how different scenarios with the same level of service compare in terms of cost, climate change adaptation, flexibility, and other planning objectives;
- identify alternatives for inclusion in the Master Plan’s monitoring and contingency plan; and
- solicit input from stakeholders on the District’s water supply strategy.

The costs and benefits of the alternative scenarios, along with the Approved for Planning scenario, are summarized in Table 2. The projects are further described in Attachment 2. Again, all of the scenarios are projected to achieve the same level of service - meet at least 85 percent of demands in

drought years (maximum 15 percent water demand reduction). The costs include, where applicable, capital costs, operations and maintenance costs over the lifecycle of the projects (typically 100 years), and rehabilitation and replacement costs of the lifecycle of the projects. It is important to note that the cost estimates are based on current information and could change over time.

Table 2. Water Supply Strategy Scenarios Summary

Scenario and Included Projects (all include “No Regrets” Package and Llagas Subbasin Recharge)	District Lifecycle Cost (Present Value, 2017)	Key Benefits
Approved for Planning (California WaterFix*, Potable Reuse-Los Gatos Ponds)	\$2.0 billion	<ul style="list-style-type: none"> • Secure existing supplies • Adapt to climate change • Protect groundwater quality
Local Flexibility (Potable Reuse-Los Gatos Ponds, Potable Reuse-Injection Wells, Potable Reuse-Ford Pond; Lexington Pipeline, Saratoga Recharge)	\$2.9 billion	<ul style="list-style-type: none"> • Secure existing supplies • Adapt to climate change • Reduce reliance on the Delta • Protect groundwater quality • Maximize District influence on operations • Allow for phased implementation
Regional Flexibility (Potable Reuse-Los Gatos Ponds, Lexington Pipeline, Saratoga Recharge, Los Vaqueros Reservoir, Dry Year Options)	\$1.7 billion with Prop 1 funding	<ul style="list-style-type: none"> • Secure existing supplies • Adapt to climate change • Reduce reliance on the Delta • Protect groundwater quality • Meet drinking water regulations • Allow for phased implementation
Local Storage (California WaterFix, Pacheco Reservoir, Groundwater Banking)	\$1.3 billion with Prop 1 funding	<ul style="list-style-type: none"> • Secure existing supplies • Adapt to climate change • Meet drinking water regulations • Provide ecosystem benefits • Provide flood protection benefits
Regional Storage (California WaterFix, Los Vaqueros Reservoir, Groundwater Banking)	\$840 million with Prop 1 funding	<ul style="list-style-type: none"> • Secure existing supplies • Adapt to climate change • Meet drinking water regulations • Minimize costs • Allow for phased implementation • Provide ecosystem benefits
Statewide Storage (California WaterFix, Sites Reservoir)	\$910 million with Prop 1 funding	<ul style="list-style-type: none"> • Secure existing supplies • Adapt to climate change • Minimize costs • Provide ecosystem benefits

*California WaterFix participation was conditionally approved.

Staff analyzed the sensitivity of four different scenarios (Approved for Planning, Local Storage, Regional Storage, and Statewide Storage) to different water supply and demand combinations. Although not specifically analyzed due to time constraints, staff anticipates that the Local Flexibility and Regional Flexibility scenarios would perform similarly to the other scenarios. The scenarios performed well under a variety of supply and demand combinations, as shown in Table 3. The “trending” demands in Table 3 are consistent with the analysis presented to the Board on September

19, 2017 and are based on current trends in water use and regional growth projections. The high demands are from the District’s Urban Water Management Plan. The low imports in Table 3, which are staff’s assumed baseline supplies for the Master Plan, are based on California Department of Water Resources modeling that assumes additional environmental restrictions that reduce Delta-conveyed imported water supplies. The high imports assume environmental requirements on Delta-conveyed imported water supplies remain as they exist today.

Staff observed that implementing Water Shortage Contingency Plan water use reduction actions in smaller, earlier increments helped minimize the severity of shortages in later years of drought. This is because a 10 percent water use reduction equates to almost 40,000 AFY, which is more than most of the scenarios could yield in multiple years of drought. Staff also observed that potable reuse, specifically the use of Los Gatos Ponds, could be better optimized. Based on current operations priorities, local surface water supply use is maximized to minimize costs and maintain water rights. As a result, modeling indicates that local water would compete with purified water for recharge in Los Gatos Ponds. Staff is currently evaluating alternatives for maximizing potable reuse while maintaining local surface water rights and minimizing losses of carried-over imported water supplies.

Table 3. Sensitivity Analysis Results

Scenario	Maximum Water Use Reduction (over 94 years)			
	Trending Demands, Low Imports	High Demands, Low Imports	High Demands, High Imports	Trending Demands, High Imports
Approved for Planning*	15%	15%	15%	10%
Local Storage	15%	30%	15%	10%
Regional Storage	15%	30%	15%	10%
Statewide Storage	15%	15%	15%	15%

*California WaterFix participation was conditionally approved.

Staff also analyzed how the four different water supply scenarios would be expected to perform in a late century (2070-2100) climate, since most of the potential investments have assumed life spans of 100 years. There is scientific consensus that temperatures and sea levels are increasing and will continue to increase. There is less consensus regarding whether precipitation will increase or decrease in Santa Clara County. However, most climate models do indicate a shift toward extremes, increasing the risk of future severe droughts and floods. Moreover, there is consensus that Sierra Nevada snowpack will decrease as increasing temperatures result in a shift from snow to rain. Both Sierra Nevada snowpack losses and sea level rise can negatively impact the availability of imported water supplies. Informed by downscaled climate model data and published reports, staff modeled the efficacy of different water supply scenarios given expected climate change.

Table 4 summarizes how the different scenarios performed in the late century analysis. All of the

scenarios have maximum water use reduction factor of 50 percent, indicating excessive water supply shortages. However, there are some differences between the scenarios. Based on the analysis, staff concluded that:

- recycled and purified water/potable reuse are the most reliable supplies because they are significantly less affected by hydrologic conditions than other sources of supply;
- the variability of local surface water supplies will likely increase, though long-term averages may stay about the same; and
- Delta-conveyed imported water supplies appear to be the most vulnerable to climate-related reductions, even when only sea level rise is considered.

Table 4. Late Century Climate Analysis Summary

Scenario	Maximum Water Use Reduction	Number of Years (out of 94) with Water Use Reductions	Minimum Santa Clara Plain Groundwater Storage** (AF)
Approved for Planning*	50%	38	125,000
Local Storage	50%	46	95,000
Regional Storage	50%	47	109,000
Statewide Storage	50%	42	101,000

*California WaterFix participation was conditionally approved.

**Santa Clara Plain groundwater storage below 139,000 AF is considered an emergency condition.

Stakeholder Input on Water Supply Master Plan

Staff held two stakeholder workshops in January 2018 - one with general stakeholders on January 12th and one with water retailers on January 30th - to solicit input on water supply projects and strategies. At the workshops, staff gave a presentation similar to the presentation to Board on September 19, 2017 that provided information on project yields, costs, benefits, and risks and presented different alternative water supply strategy scenarios. Input from the workshops is provided in Attachment 3 and summarized below.

- Continued observation that demands have been relatively flat and it is uncertain how much and when they will increase. The District should avoid overinvesting now in projects that may not be needed.
- Broad support of water conservation, onsite reuse, recycled water, and potable reuse. Some stated the District should maximize these before investing in other types of projects.
- Continued interest, especially among non-retailer stakeholders, in looking at alternatives to California WaterFix and reduced reliance on the Delta
- Concern that the water supply benefits associated with expanding Pacheco Reservoir are small compared to the cost. Request that staff develop more information on how the

expanded reservoir would be operated, local watershed yield, and how much otherwise “spilled” Central Valley Project contract supplies would be stored in the reservoir.

- Mixed input on the level of service goal. Some would like to see a lower level of service goal with mandatory restrictions to force more efficient water use. Some would like to see a lower level of service goal to reduce the level of investment. Some stated the interim level of service goal seems about right.
- Significant concern, primarily among retailers, about impacts on rates, sustainability, and affordability. The District should only invest in projects that are required for achieving its level of service goals.

Staff updated the project list in Attachment 2, developed an additional alternative scenario that does not include California Water Fix, and updated presentation material and the District’s website in response to stakeholder comments. Staff is also analyzing Pacheco Reservoir project modeling to better understand the mix of water supplies in the reservoir and how they would be used. Staff will incorporate remaining stakeholder input into future recommendations where appropriate, though much of the input is on policy that needs to be part of the Board’s discussions.

Level of Service Goal

Staff will be working with the Board’s Water Conservation and Demand Management Committee to develop a level of service goal recommendation for the full Board. In preparation for those discussions, staff estimated the benefits and costs of different levels of service. Level of service is the estimated maximum shortage level associated with a water supply strategy scenario. Costs are the estimated costs of the projects in the water supply strategy scenario. Benefits are the estimated value of having fewer and lower level shortages. Figure 1 shows the range of benefits and costs at different levels of service compared to a base case that does not include any new projects. In most cases, the benefits of water supply strategy scenarios exceed the costs of the scenarios, indicating that most scenarios are cost-effective. The scenarios that are not cost-effective are those that maximize potable reuse, i.e., include more than just the Los Gatos potable reuse project.

Staff is currently updating how the District’s Water Shortage Contingency Plan is implemented in the water supply system model, so that the shortage levels will correspond to 10 percent increments, rather than having the jump from 15 percent to 30 percent. This will likely change the value of benefits associated with different levels of service, but not the overall conclusions regarding cost-effectiveness.

Figure 1. Costs and Benefits of Different Levels of Service



Since different levels of service can be achieved cost-effectively, the Board will need to use other considerations in deciding on the level of service. These other considerations could include stakeholder input, consistency with State and regional policy, frequency of shortage, preferred water supply strategies, and feasibility.

Next Steps

The next steps in the Water Supply Master Plan process are to work with the Board’s Water Conservation and Demand Management Committee to develop a recommended water supply reliability level of service goal, update costs after Prop 1 Water Storage Investment Program funding decisions are made in Summer 2018, refine alternative water supply strategies, and develop a recommended strategy and associated monitoring and contingency plan. Stakeholder engagement will be ongoing.

FINANCIAL IMPACT:

There is no financial impact associated with this item.

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: PowerPoint

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Attachment 2: Project List

Attachment 3: Stakeholder Workshops Summary

UNCLASSIFIED MANAGER:

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