STAFF REPORT

Meeting Type:	Board of Directors
Title:	Review of Desalination and Recycled Water Costs
From:	Paul Sellier, Water Resources Director
Through:	Bret Uppendahl, Acting General Manager
Meeting Date:	June 18, 2024

TYPE OF ACTION: Action X Information Review and Refer

RECOMMENDATION: Review of Desalination and Recycled Water Costs

SUMMARY: On February 28, 2023, the Board selected the Integrated Roadmap for improved water supply resiliency (Roadmap); and since that time, staff has been implementing the early action projects, while in parallel working to advance the longer term, more complex projects. As the options narrow and costs come into focus for Local Storage and Conveyance of winter water, it is important to revisit the costs associated with other water supply alternatives included in the Roadmap.

DISCUSSION: The Roadmap consists of 5 broad strategies for developing a resilient water supply including Water Efficiency, In-District Improvements, Sonoma-Marin Partnership, Local Storage Enlargement and New Supply Development which includes desalination and recycled water. Water Efficiency program costs were discussed at the May Finance and Administration Committee meeting. At this meeting, staff will review the desalination and recycled water alternatives with a focus on updated costs of supply during drought.

To compare water supply alternatives it is useful to develop a unit cost of water, or cost per acre-foot. The components of this metric typically include all costs expressed as an annualized figure divided by an average annual yield. This is considered a traditional approach, and it works well when the water supply project is fully utilized and the water produced fills an existing and ongoing demand.

To compare alternatives that provide supplemental water during a drought, the costs are relatively simple to calculate, however, determining the beneficial yield of drought water supply projects is more complex. While there are various approaches to estimating yield by predicting the timing, severity and duration of a drought, all approaches are ultimately only estimates.

For the purposes of comparing different drought water supply projects a simple estimate of yield generally provides an adequate basis for comparison. For this analysis we are proposing a yield

estimate for a single four–year drought and the associated cost for each option will be expressed as a present value that includes all costs going out to the end of the project's respective planning horizon. All costs include the annual cost to finance the capital to design, permit and construct the project, replacement costs (for assets that have a shorter useful life than the planning horizon) and any annual Operational and Maintenance (O&M) costs. O&M costs tend to vary based on volume of water produced, however some O&M costs, such as staffing, are fixed. Additionally, avoided costs are appropriate for the water efficiency program that reduces overall demand, however avoided costs are not credited to new drought water supply projects as these projects are considered in addition to other water production facilities. During the meeting staff will present information on the cost of Desalination and Recycled Water as drought water supply projects.

Desalination

As part of the Strategic Water Supply Assessment, the Jacobs team developed detailed cost estimates for different capacities of (open intake) desalination plant. The Jacobs team were involved in the District's 2005/2006 desalination pilot program and as such are very familiar with site constraints and the level of detail in their cost estimates indicates the degree of effort that was made to provide the most accurate and complete capital costs possible. Annual operating costs for a desalination plant operating at or near capacity are estimated by Jacobs to be between $13 million and $30 million depending on capacity; and though a portion of these costs are fixed, the remainder are scalable based on the utilization rate.

Desalination has the highest reliability of the drought supply options yet the unit cost are relatively high compared to other alternatives due to the unavoidable and ongoing O&M cost burden associated with the need to operate the facility even when the water is not needed. Additionally, desalination would require a vote of the public to authorize financing and construction of a desalination plant. During non-drought years the plant will continue to be operated, even though water will not be needed, at reduced capacity to ensure operational readiness. Staff will present the costs for desalination over a range of yield considerations.

Recycled Water

The Strategic Water Supply Assessment contemplated different ways to expand recycled water in the District's service area:

- ***Traditional purple pipe*** projects that deliver tertiary treated recycled water to customers for irrigation and toilet flushing.
- ***Indirect Potable Reuse*** **(IPR)** projects that utilize a reservoir with a sufficiently long detention time to store and blend highly treated wastewater before treating the water again through a drinking water treatment plant (S*urface Water Augmentation - SWA*).
- ***Direct Potable Reuse*** **(DPR)** projects that involve sending highly treated wastewater directly into the potable distribution system for consumption (*Treated Water Augmentation - TWA*) or placing the highly treated wastewater in a reservoir with a short detention time (*Raw Water Augmentation - RWA*).

In general, costs for irrigation and toilet flushing projects are driven by the length of pipelines needed to connect customers. In the District's service area the lack of anchor tenants that use large volumes of water results in high unit costs for purple pipe projects. Cost drivers for DPR and IPR include new treatment facilities similar in complexity to desalination treatment plants and in the case of IPR, large

pump stations and several miles of dedicated pipeline are needed to move the untreated water to the centralized treatment facility and to convey the treated water to the reservoirs.

Of the recycled water alternatives DPR (treated water augmentation) has the lowest cost, yet there are considerations for this project that need to be weighed including public acceptance, the lack of operating experience for this type of facility within the United States, how the regulatory landscape could change in the future and, similar to desalination facilities, the plant will need to be operated continuously even in non-drought years. Staff will present costs for recycled water for example projects including traditional purple pipe projects and DPR (treated water augmentation).

ENVIRONMENTAL REVIEW: Not Applicable.

FISCAL IMPACT: None.

ATTACHMENT(S): None.