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**File No.:** 17-0630

**Agenda Date:** 9/12/2017

**Item No.:** \*2.1.

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## BOARD AGENDA MEMORANDUM

### **SUBJECT:**

California WaterFix Update, Including Water Supply Analysis, Cost and Water Allocation, and Financing.

### **RECOMMENDATION:**

Receive and discuss information on the California WaterFix, including a water supply analysis, cost and water allocations, and financing.

### **SUMMARY:**

This agenda item provides an opportunity for the Board and the public to receive information on the proposed California WaterFix (WaterFix) project, which is intended to help restore the health of the Delta ecosystem and to ensure the long-term reliability of water supplies conveyed through the Delta. The proposed WaterFix includes dual tunnels under the Delta that would provide an alternative conveyance pathway for moving water from the north Delta to the existing pumping plants in the south Delta. The addition of proposed WaterFix intakes in the north Delta would allow the State and federal water projects to adjust operations in response to environmental conditions and climate change effects, protect exports from the threat of salinity intrusion from levee failures and sea level rise, improve access to transfer supplies, and enhance the benefit of storage projects. The WaterFix is also expected to improve flow patterns in the Delta and reduce fish entrainment.

Because Santa Clara County relies on State Water Project (SWP) and Central Valley Project (CVP) water supplies conveyed through the Delta to meet 40 percent, on average, of its water supply needs, the District has an interest in the development of the WaterFix as a potential cost-effective project that could improve the reliability of the District's imported water supplies.

The Department of Water Resources (DWR) is proceeding with WaterFix as an integral part of the SWP. Under this approach, the costs and benefits of the WaterFix would be allocated to all State Water Project contractors south of the Delta, including the District, through existing contracts. The US Bureau of Reclamation (Reclamation) has not yet clearly stated its intent with respect to the WaterFix, but current discussions are centered around an optional participation approach for CVP contractors. The District has not yet decided whether or not to participate in the WaterFix to convey its CVP contract water supplies.

To help prepare the Board for future decisions on involvement with and participation in WaterFix, staff

has planned a series of agenda items describing major elements of the project. At the May 25, 2017 Special Board Meeting, a panel of experts presented detailed information describing the physical aspects of the project, estimated costs, methods for cost control, and construction risk management. At its July 11, 2017 meeting, the Board received an update on several planning and permit related activities for the WaterFix. And at its August 22, 2017 meeting, the Board received an update on WaterFix design and construction management and governance, anticipated operations, and adaptive management program.

This agenda item provides updated information related to project financing, cost and water allocations, and updated water supply analyses. Staff provided preliminary analyses of these at Board meetings on December 13, 2013 and July 12, 2016, based on the draft project documents at the time. This item updates those analyses and discusses a range of potential participation levels for the District in order to inform a potential Board decision in October 2017 on future involvement with and/or participation in the WaterFix project. Staff is planning the following schedule of communication with the Board regarding the WaterFix.

Date	Topic
May 25 2017	Cost estimation, risk assessment and management, and cost control for the WaterFix. (Done)
July 11, 2017	Update on WaterFix. (Done)
August 22, 2017	(1) Issues facing the District's imported water supply and the Delta ecosystem (2) WaterFix update including proposed design and construction management and governance, operations, and adaptive management. (Done)
<b>September 12, 2017 (today)</b>	<b>WaterFix update, including water supply analysis, cost and water allocation, and financing.</b>
September 26, 2017 (tentative)	WaterFix update including proposed term sheets.
October 10, 2017	Staff recommendation and request for Board decisions on involvement with and/or participation in the WaterFix.

**Overview of Agenda Memo**

- A. Background
- B. SWP and CVP participation approaches
- C. Water supply analysis
- D. Total WaterFix Costs
- E. Cost allocation

- F. Financing
- G. Costs to Santa Clara County
- H. Next Steps

## **A. BACKGROUND**

### ***A.1 Importance of imported water supplies to Santa Clara County***

Imported water supplies are critical for sustaining the communities and businesses of Santa Clara County and protecting the region from irreversible land subsidence. On average, 40% of the county's water needs are met by importing water through the Sacramento-San Joaquin Delta. Another 15% of county supply needs are satisfied by diversions upstream of the Delta by the San Francisco Public Utilities Commission's Regional Water System.

The District's Delta supplies are conveyed by the State Water Project (SWP) and Central Valley Project (CVP), which together are a critical component of the District's water supply portfolio, providing the majority of water supply to the District's three drinking water treatment plants, recharging the county's local groundwater basins to ensure sustainable supplies and protect against land subsidence, and protecting local surface water reserves. During critically dry years and long-term droughts, the county's dependence on Delta supplies increases as local reserves diminish.

The District's SWP and CVP supplies offer additional flexibility in that these supplies may be stored in facilities outside of the county, including the Semitropic Groundwater Bank (Semitropic), for withdrawal during dry periods. Semitropic has proven to be a valuable resource, providing over 142,000 acre-feet (AF) of critical dry year supply to the county during the 2012 - 2016 drought; however, supplies from Semitropic are conveyed to the District through the Delta, and the reliability of the bank is linked to the reliability of the Delta.

### ***A.2 Risks to imported water supplies***

For the past several decades, protected fish species have declined and ongoing concern over the health of the Delta estuary has led to increasing regulatory restrictions that have reduced the amount of water that could be diverted from the existing Delta channels for delivery to Santa Clara County and other agencies south of the Delta. If no action is taken, it is likely that additional regulatory restrictions will be placed on the SWP and CVP that further limit the District's access to its imported water supplies.

As described in the August 22, 2017 Board item, "Issues Facing the District's Imported Water Supply and the Delta Ecosystem", a number of reports have highlighted the unsustainability of the existing condition, management, and uses of the Delta. The State and United States Geological Survey have predicted high probabilities of a major earthquake in the next 25 years that could cause catastrophic levee failure and significant impairment of water deliveries due to salinity intrusion. These risks are exacerbated by sea level rise and other effects of climate change.

### ***A.3 California WaterFix***

The California WaterFix would provide an alternative conveyance pathway for moving water from the north Delta to the existing pumping plants in the south Delta. The conveyance upgrades include three new intakes on the Sacramento River, each with a capacity of 3,000 cfs, and each equipped with state-of-the-art fish screens. These new fish screens would be designed to minimize entrainment and would be more effective at protecting fish than the existing South Delta pumping plants. Two forty-foot diameter tunnels up to 150 feet below ground would convey the water from the Sacramento River to existing pumping plants in the south Delta. Bypass flow criteria would be imposed on diversions from the Sacramento River into the tunnels to ensure adequate flows remain in the river to protect fish; consequently, diversions into the tunnels primarily occur during higher river flow periods on the Sacramento River.

### ***A.4 Water Supply Master Plan***

The District is committed to developing approaches for improving local and regional water supply reliability and meeting future demands, and is currently updating its Water Supply Master Plan to evaluate local, regional, and statewide water supply projects, including the WaterFix. The Water Supply Master Plan is the District's strategy for providing a reliable and sustainable water supply in a cost-effective manner. Staff is currently evaluating portfolios that include California WaterFix, additional surface and groundwater storage, water conservation/demand management, and additional water reuse, and plans to present the refined portfolios and associated analyses to the Board on September 19, 2017.

### ***A.5 State Water Contract***

The long-term State Water Contract provides the District with access to the SWP conveyance system and an annual proportional allotment of available water. The maximum amount of SWP water that the District may request for delivery each year is 100,000 acre feet, as set forth in Table A of its State Water Contract. However, the amount of water the District is actually allocated has been as low as 5,000 acre feet per year. Water deliveries are affected by a variety of factors, including hydrological conditions, State Water Resources Control Board regulations, restrictions imposed under federal or California Endangered Species Acts, operational decisions, and other limitations.

The District must make payments regardless of the amount of SWP water actually received. The State Water Contract requires payments to DWR in return for participation in the SWP storage and conveyance system. All SWP Contractors must make payments according to their respective Table A contract amounts and for the portion of the SWP conveyance system needed to deliver their contracted water. The amount of the base payment is not tied to the amount of water actually received.

To protect against default, the SWP State Water Contract includes articles that obligate each SWP Contractor to make payments. The contract articles also include language that obligates, and if necessary compels, a SWP Contractor to levy taxes or assessments in the event of non-payment. Additionally, the State may suspend water deliveries, within health and safety limits, if a contractor is in default for a significant period.

There are additional provisions related to default on charges for SWP capital facilities financed with revenue bonds. The SWP State Water Contracts provide for the state to protect bondholders and non-defaulting contractors against costs resulting from any SWP Contractor's failure to make payments related to the revenue bonds. In practice, the State administers this provision by maintaining a revenue bond reserve equal to one half the maximum annual revenue bond debt service for all outstanding revenue bonds and by adding a 25 percent refundable surcharge to the SWP Contractor's revenue bond capital charge.

In exchange for SWP Contractor payments, DWR is required to make all reasonable efforts to complete facilities necessary for water deliveries, subject to fiscal, construction scheduling, and operating constraints.

### ***A.6 Central Valley Project Water Service Contract***

The District's water service contract with the U.S. Bureau of Reclamation provides the District with deliveries of up to 152,500 acre-feet of water from the CVP system; however, the amount of water that the District actually receives is often much less than the contracted amount and is often limited by regulations and restrictions as well as hydrologic conditions. In 2015, the District was allocated only 40,320 acre-feet of its CVP contract supply.

## **B. SWP AND CVP PARTICIPATION APPROACHES**

Recent discussions among State and federal agencies have assumed that 55% of the cost and water supply benefits of the WaterFix would be allocated to the SWP, and 45% to participating CVP contractors (55/45 split). However, the actual split will depend on which CVP contractors ultimately participate.

DWR plans to move forward with the WaterFix as an integrated part of the SWP. Under this approach, each of the SWP contractors south of the Delta would pay for its proportionate share of the project and receive corresponding project benefits. Contractors would be billed through the DWR's Statement of Charges, consistent with current business practice, and the water supply benefits would be reflected as increased SWP allocations, increased capacity to convey transfers under the existing contract, and continuation of deliveries in the event through Delta pumping is impeded. SWP contractors located north of the Delta will not be allocated any costs related to the WaterFix with the justification that these contractors do not receive benefits from the project. The District's share of costs and benefits correspond to roughly 2.5 percent under the existing SWP contract. No additional action would be required of the District to incur these additional costs and receive these benefits. However, if a SWP contractor wishes to offset increased costs from the WaterFix, or make additional payments to increase its water supply benefits, the existing contract allows for the transfer of SWP supply (Table A supply) from a willing seller to a willing buyer, both of whom must be SWP contractors.

Among CVP contractors and Reclamation, discussions have focused on an opt-in approach. CVP water contractors would have to make a definite decision about whether they want to participate in the project, and if they do, to what degree. The approach, which is still under development, is

intended to allocate the benefits of the project to project participants, while not harming other CVP contractors who do not participate. Under the approach, if the District pays for 5% of the CVP portion of WaterFix costs, then it would receive 5% of the CVP incremental water supply produced by the WaterFix, as well as a proportional interest in the physical capacity of the project. This approach is still being developed and may change over the coming weeks.

Under this framework, CVP participants would have the ability to sell, exchange, or transfer their rights and obligations to other CVP or SWP contractors

## C. WATER SUPPLY ANALYSIS

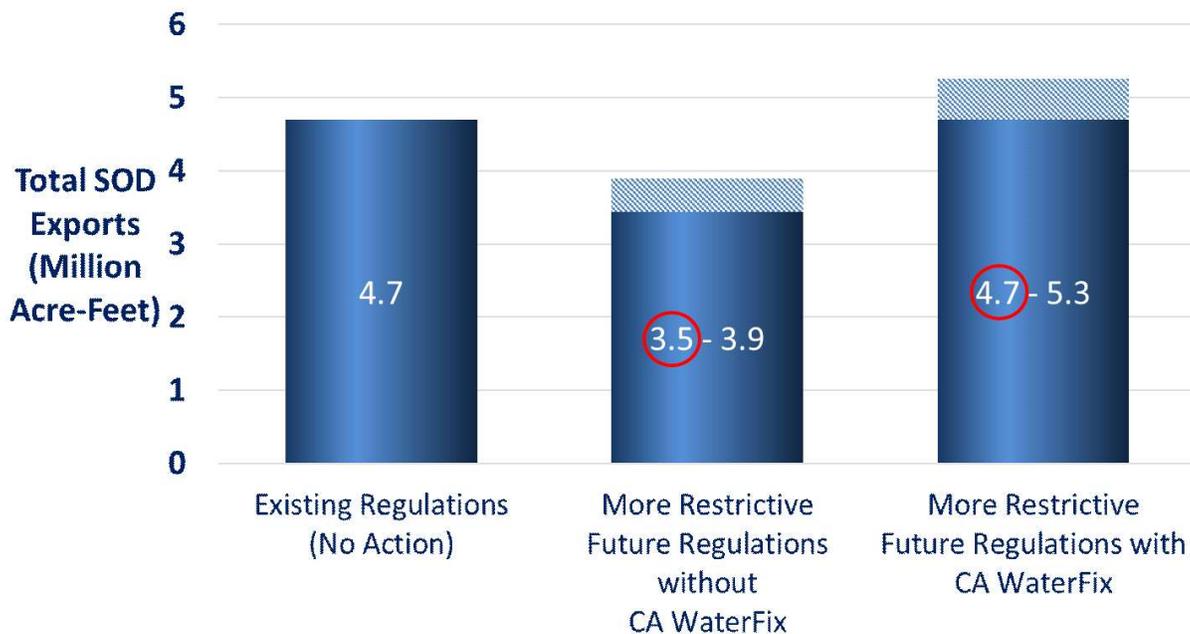
### *C.1 Sustaining existing export levels*

The State's long-term modeling analysis predicts that the WaterFix will prevent the degradation of Delta exports over time. Given the current administrative processes and conservative regulatory trends, staff does not anticipate that long term average exports with the WaterFix would exceed those of existing conditions unless new science provides compelling evidence to support such increases. However, analyses indicate that the project will likely maintain at least existing long-term export levels and provide resiliency against future risks.

Existing long-term average SWP/CVP water deliveries south of the Delta average 4.7 million acre-feet per year (MAF/Y). If no action is taken to improve the existing Delta conveyance approach, DWR projects that total SWP/CVP deliveries could drop to 3.5 MAF/Y in response to a set of regulatory constraints, often referred to as the "High Outflow Scenario", proposed but not currently adopted by resource agencies. Other scenarios modeled show a lesser reduction in exports to 3.9 MAF/Y. A future reduction in exports is being viewed by a number of water agencies as the future "no action" or future "base case" scenario, given the current high level of concern for protected fish species and the definite trend of decreasing exports in response to increasing regulations.

Based on the operating criteria included in the Biological Opinions, DWR projects that SWP\CVP water deliveries would range between 4.7 MAF/Y and 5.3 MAF/Y with the WaterFix. The lower end of this range assumes that the WaterFix is operational with High Outflow Scenario regulations in place. The increased regulations in this scenario have been contemplated in recent years by resource agencies but have not been incorporated into current regulations. The upper end represents a lesser case of stepped up export restrictions. Actual deliveries will depend on the specific operational criteria that the regulatory agencies impose at the time new conveyance facilities become operational.

***Figure 1. Long-term annual average SWP/CVP deliveries south of the Delta (SOD)***



○ Values correspond to the High Outflow Scenario

### C.2. Water Supply Benefits for the State and Santa Clara County

The WaterFix is intended to help stabilize and sustain the water supply of the State of California, including 40% of the District’s water supplies, which are conveyed through the Delta, providing these supplies with resiliency against changing environmental conditions, sea level rise, climate change, and seismic events.

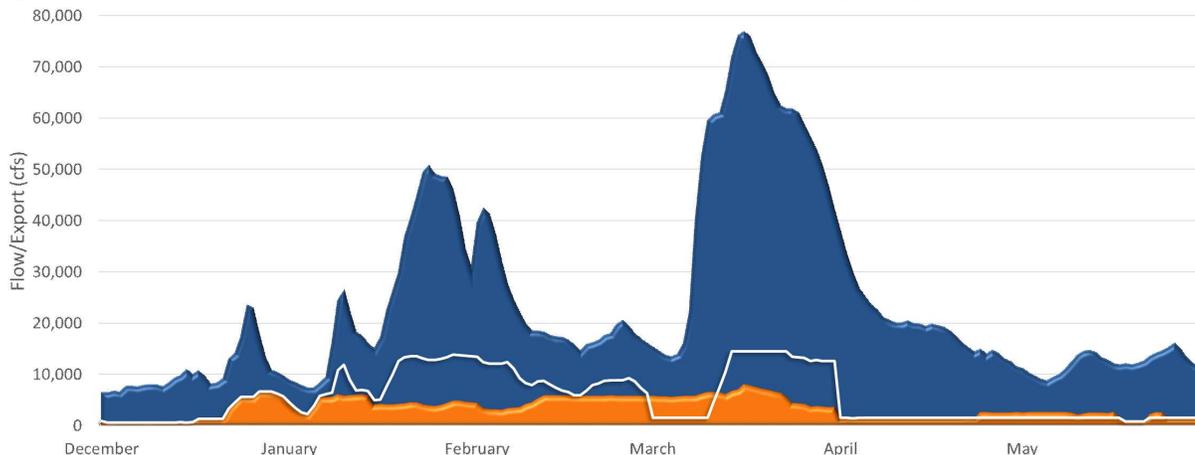
#### C.2.1 Storm flow capture

The operating criteria for the WaterFix are crafted such that the project will divert water into the WaterFix tunnels primarily at higher flow events. These are often flows that the SWP/CVP are currently unable to capture without harming fish species of concern due to the location of the existing pumps.

Figure 2 illustrates how the WaterFix could have provided for additional exports during storm events that occurred during the 2015 and 2016 drought. Additional storm flows of roughly 420 thousand acre-feet (TAF) in could have been exported south of the Delta in the winter of 2015-16. This additional flexibility to capture high river flows may become even more important under climate change scenarios that project potentially more frequent and intense floods, more rain and less snow

events, and faster snow melts.

**Figure 2. Potential storm water capture with WaterFix. Source: Analysis by State Water Contractors.**



2015-2016 Winter  
WaterFix could have captured an additional 669,000 acre-feet of storm flows

### C.2.2 Resiliency to Delta levee failure events

As described in the August 22, 2017 Board item, “Issues Facing the District’s Imported Water Supply and the Delta Ecosystem”, an important risk to reliable imported water supplies is the condition of the 1,100 miles of levees in the Delta, their vulnerability to earthquakes, and climate change effects such as sea level rise and more extreme flood events. The WaterFix would mitigate these risks by providing two tunnels with intakes on the Sacramento River upstream of the area likely to be affected by salt water intrusion, and designed to withstand anticipated large floods with a one-in-200-year frequency.

### C.2.3 Resiliency to climate change

As described in the August 22, 2017 Board item, “Issues Facing the District’s Imported Water Supply and the Delta Ecosystem”, an important risk to reliable imported water supplies is sea level rise and other climate change effects. WaterFix can protect against sea level rise by diverting from the north Delta where salinity intrusion will be minimal under reasonable sea level rise scenarios. WaterFix also provides additional flexibility to capture storm flow events, as described above, which may be more frequent under climate change scenarios.

WaterFix facilities are being designed and constructed for a 55-inch sea level rise at the Golden Gate. This equates to about an 18-inch rise from the present levels at the proposed north Delta diversions. On top of that, project engineers have built in a safety factor to handle a 200-year storm event.

#### *C.2.4 Access to transfer supplies*

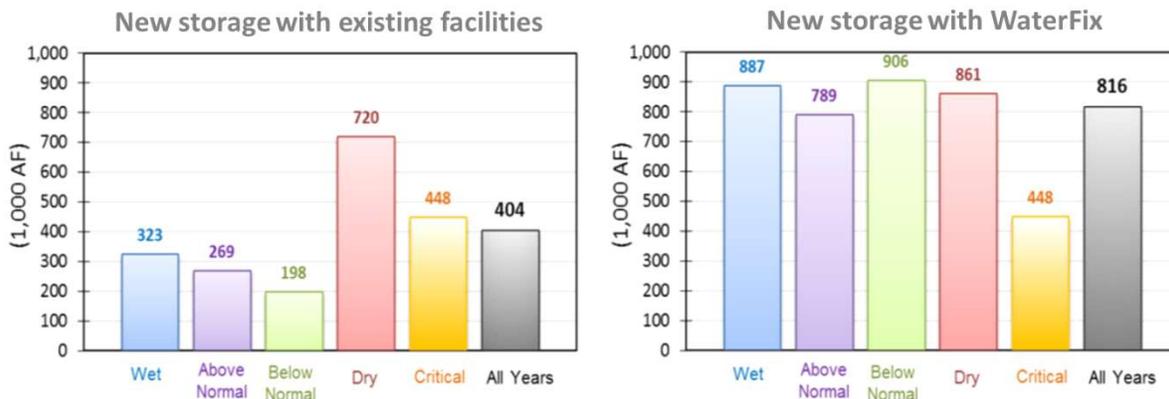
WaterFix provides the ability to more effectively move transfer water. With existing regulations, transfers cannot be moved across the Delta when the SWP allocation is about 50% or greater. This scenario occurs when pumping restrictions cause water to be backed up in northern reservoirs during winter and spring months, with a limited window to move the water across the Delta during the summer. Under these circumstances, all available pumping capacity is used to move this stored SWP and CVP water, and there is no additional capacity available to convey transfer supplies. The WaterFix would allow stored water to be conveyed earlier in the year which would increase the opportunity to convey transfer water during summer months to the District and other south-of-Delta contractors.

The use of WaterFix to move transfer supplies would also reduce losses across the Delta, which currently average roughly 25% and have been as high as 35% of the total transfer amount. The WaterFix's ability to minimize this loss would increase the effectiveness of any transfer the District participated in.

#### *C.2.5 Improving storage project yield*

The Association of California Water Agencies (ACWA) recently analyzed how improved Delta conveyance capability could increase the benefits of eight proposed storage facilities. They found that WaterFix could more than double the average benefit of the proposed new storage projects under current regulatory constraints if the proposed storage projects were integrated into the operations of the SWP/CVP (see Figure 3 below). Similar to improved transfer capacity, the WaterFix would improve the ability to convey water from storage north of the Delta to storage south of the Delta. Staff's analysis indicates that investment in WaterFix would increase the yield of local and regional storage projects such as the expansion of Pacheco Reservoir, Sites Reservoir, and Los Vaqueros Reservoir Expansion. Additional information on this interaction will be provided in the planned September 19, 2017 Board agenda item on the Water Supply Master Plan.

***Figure 3. Average annual changes in SWP/CVP deliveries with new storage and existing facilities (left) and with new storage and WaterFix (right) by water year type. Source: MBK Engineers, 2017.***



**C.3 Water supply analysis in the context of the District’s Water Master Plan**

Staff estimated the incremental water supply available to Santa Clara County and assessed how water supply conditions would change if the District participated in the WaterFix. The analysis assumes the participation approaches described in Section B are implemented, and that the District can choose to increase its participation on the SWP side above 2.5% by purchasing additional SWP supplies from other participating SWP contractors. On the CVP side, the District will need to decide whether it wishes to participate in the project, and if so, to what degree. Three participation scenarios were evaluated:

1. Balanced participation (2.5% SWP/2.5% CVP): The District participates in the WaterFix at a 2.5% level through the SWP, corresponding to 2.5% of water supply benefits and 2.5% of costs. This level of participation is consistent with the District’s share of benefits and costs under its existing SWP contract. In addition, the District purchases 2.5% of the water supply benefits offered to CVP contractors.
2. Higher CVP participation (2.5% SWP/5% CVP): The District’s participation level is 2.5 percent for the SWP; the District purchases 5 percent of the water supply benefits offered to CVP contractors.
3. Higher SWP participation (5% SWP/2.5% CVP): The District increases its participation level on the SWP side by purchasing a long-term transfer of an average of approximately 15,700 acre-feet of WaterFix incremental water supply from other SWP contractors. On the CVP side, the District purchases 2.5% of benefits.

These scenarios were analyzed relative to a future base case with no WaterFix and declining exports, consistent with the State’s High Outflow Scenario (“HOS”) described in Section C.1:

Base case: The WaterFix does not exist, and new export restrictions further restricting pumping from the South Delta have been implemented. Average annual exports from the SWP and CVP projects decrease from 4.7 MAF per year to 3.5 MAF per year.

The three scenarios and the base case were analyzed using water supply assumptions consistent with the District's Water Supply Master Plan, including the following:

- 2040 demand projections are utilized and the District's existing water system facilities are in place.
- All dam seismic retrofit projects are completed.
- Retailers continue on their path to achieve 32,000 acre-feet per year of non-potable recycled water by 2040.
- Currently planned and on-track conservation savings of 99,000 acre-feet are attained.
- Main and Madrone pipelines are repaired.

In addition, the three scenarios and base case also includes a set of "No Regrets" actions, which would likely be pursued regardless of development of any of the water supply alternatives being evaluated as part of the Water Master Plan. These actions include:

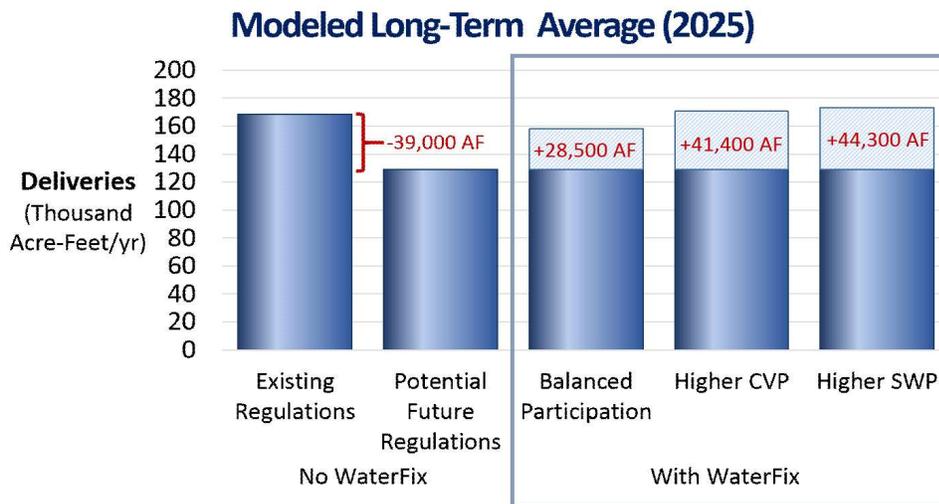
- Implementation of a new development model ordinance
- Graywater program expansion
- Offer leak repair incentives
- Expand advanced metering infrastructure
- Increase stormwater recharge (2 projects)
- Develop agricultural land recharge
- Development of rain gardens
- Incentivize rain barrels

### *C.3.1 Results*

#### *C.3.1.1 Water supply benefits*

The analysis indicates that the three participation scenarios would offset losses in the District's SWP and CVP water supplies that would potentially occur if no action were taken. Figure 4 summarizes the results, comparing the District's average annual SWP and CVP deliveries under existing conditions, under potential future regulations consistent with the High Outflow Scenario, and under the three participation scenarios. The Higher CVP and High SWP participation scenarios are predicted to maintain SWP and CVP supplies at existing levels, while the Balanced Participation scenario provides lesser water supplies but offsets most of the potential losses that would potentially be incurred if no action is taken.

***Figure 4. Projected imported water supplies under various participation levels***



The District’s analysis also indicates that participation in the WaterFix under the three scenarios could significantly improve groundwater storage conditions, substantially increase reserves in the Semitropic Groundwater Bank, and reduce the frequency and magnitude of water shortages. These benefits will be described in more detail and compared to the benefits of other alternative water supply projects as part of the Water Master Plan analysis, which will be presented to the Board on September 19, 2017.

*C.3.1.2 Water quality benefits*

In addition to increasing the District’s water supplies relative to the base case, operation of the proposed north delta intakes is anticipated to improve the water quality of the District’s imported water supplies by decreasing the average annual salinity of SWP/CVP exports by about 22 percent compared to the future base case. This would reduce the salt loading of deliveries to the District’s three drinking water treatment plants, and to the District’s managed groundwater recharge program. In addition, because current treatment plant processes do not substantially change the salt content of source water, any improvement in the salinity of source water is reflected in the potable water that is consumed, and in potable water that is distributed through irrigation systems to landscaping. In total, staff estimates that reducing the salinity of imported water by 22 percent would reduce the total amount of salt loading to groundwater in northern Santa Clara County through landscape irrigation and managed recharge by about 18 percent. This result is significant in the context of the District’s Salt and Nutrient Management Plans.

**D. Total WaterFix costs**

The overall costs for the proposed infrastructure improvements and environmental mitigation for the WaterFix were originally developed for the Bay Delta Conservation Plan (BDCP) and were reported in Appendix 8 of the 2013 BDCP Environmental Impact Report/Environmental Impact Statement for that project. This estimate was subsequently revised to reflect the changes made as part of the WaterFix, including optimal alignment of project facilities and updated operations and mitigation

costs. At the District’s May 25, 2017 Special Board Workshop, the Board received a detailed description of the methods used to develop this latest estimate of project costs.

Total capital construction costs for water facilities and mitigation are estimated to be \$16.7B, in 2017 dollars. Of this amount, \$16.3B is for water facilities and \$400M is for mitigation construction costs. The estimate of annual operations and maintenance costs is \$64.4M per year. The portion related to water facility operations, including power needs and capital replacement costs is estimated to be \$44.1M, while annual mitigation costs are an additional \$20.3M. For this memo, costs have been converted to 2017 dollars using an escalation rate of 3 percent, as shown in Table 1.

**Table 1: California WaterFix Cost Summary**

	2014 \$M	2017 \$M
<b>CAPITAL COSTS</b>		
<b>Water Facility</b>		
Construction	9,499	10,380
Contingency (36%)	3,378	3,692
Program Management/Construction Management/Engineering	1,920	2,098
Land Acquisition (includes 20% contingency)	146	160
<b>Sub Total Water Facility</b>	<b>14,943</b>	<b>16,330</b>
<b>Mitigation (includes 35% contingency) (1)</b>	<b>367</b>	<b>401</b>
<b>Total Water Facility and Mitigation Capital Costs</b>	<b>15,310</b>	<b>16,731</b>
<b>ANNUAL OPERATIONS AND MAINTENANCE COSTS (2)</b>		
<b>Water Facility</b>		
Facility O&M	20.0	21.9

Power	6.6	7.2
Capital Replacement	13.7	15.0
<b>Sub Total Water Facility</b>	<b>40.3</b>	<b>44.1</b>
<b>Mitigation (1)</b>	<b>18.6</b>	<b>20.3</b>
<b>Total Annual O&amp;M Costs</b>	<b>58.9</b>	<b>64.4</b>
(1) The mitigation costs for capital and O&M for 25 years equals \$796M in 2014 dollars or \$870M in 2017		

**E. COST ALLOCATION**

The current approach allocates 55 percent of the cost and water supply benefits of the WaterFix to the SWP, and 45 percent to participating CVP contractors (55/45 split). However, the actual split will depend on which CVP contractors participate.

The approach assumed for allocation of costs among the individual SWP and CVP WaterFix participants is that described in Section B above.

**F. WATERFIX FINANCING**

The approach currently being developed assumes that bonds will be issued to fund the construction, planning, and other preconstruction costs, including reimbursement of funds and services previously provided by a subset of contractors. Both DWR and a joint powers authority comprised of participating SWP and CVP contractors (Finance JPA) would issue bonds in a manner that would separately fund the SWP and CVP portions of cost.

***F.1 Financing the SWP share of WaterFix***

Long-term financing of the SWP share of project costs (\$9.2B in 2017 dollars, assuming a 55/45 SWP/CVP split) is expected to be provided by DWR’s issuance of revenue bonds. The principal and interest on the bonds would be paid with revenues collected by DWR under its existing SWP water supply contracts.

DWR anticipated legal challenges to its authority over the project, potentially affecting the marketability of revenue bonds to private investors. DWR therefore filed a “validation action” with the Sacramento County Superior Court regarding DWR’s authority to, among other things, issue revenue bonds to finance the planning, design, construction and other capital costs of the WaterFix. DWR believes it has existing legal authority to finance and construct the WaterFix, but a validation action provides the requisite assurance to the financial community for the sale of the WaterFix revenue bonds. While the validation action is being resolved, which could take several years, DWR proposes to initially make direct placement sales of revenue bonds to the Finance JPA to allow funding for the project to proceed. DWR anticipates issuing these bonds beginning in mid-2018.

An approach for project financing is currently under discussion between DWR and potential WaterFix

participants. Under this approach, the Finance JPA would purchase WaterFix revenue bonds directly from DWR as they are issued, and the proceeds of these bonds would be used to pay for capital construction costs. The Finance JPA would simultaneously finance its purchase of these WaterFix revenue bonds by issuing its own bonds (Finance JPA Bonds). DWR would pay the debt service for the Finance JPA Bonds through collection of charges applied under existing SWP contracts to all SWP contractors south of the Delta.

If a final judicial determination is made that DWR has the authority to issue revenue bonds, such bonds would be issued to refund all outstanding Finance JPA Bonds. In the event that DWR does not have the authority to issue revenue bonds for the WaterFix, a process would be established to potentially convey the interest and ownership of the project to the Finance JPA or designee. In the scenario that DWR does not have the authority, SWP contractors that are members of the Finance JPA would have to “step up” to pay the debt service for the outstanding Finance JPA Bonds.

### ***F.2 Financing the CVP contractor share of WaterFix***

The approach currently under discussion assumes that financing for the CVP portion (\$7.5B in 2017 dollars) of project costs would be provided by bond issuances by the Finance JPA. The Finance JPA would issue separate bonds for each participating CVP contractor, commensurate with that CVP contractor’s participation level in the WaterFix and backed only by that CVP contractor, thus eliminating the need for step up provisions. The participating CVP contractors would provide payments to the Finance JPA to cover debt service, and the Finance JPA would provide bond proceeds to DWR under a separate agreement for construction of the WaterFix.

### ***F.3 Interim funding***

DWR’s direct placement of WaterFix revenue bonds is not expected until the middle of 2018. In the interim, DWR proposes to fund continuing design and preconstruction costs by using “Article 51(e) revenue”, as well as requesting additional contributions from participating contractors.

Article 51(e) revenues are SWP funds that DWR may allocate to certain SWP purposes, subject to the Director of DWR’s discretion. DWR is proposing to use Article 51(e) revenues to fund project planning and design work through December 31, 2017.

Beginning in January 2018, DWR intends to request additional contributions from willing SWP and CVP contractors to fund preconstruction costs. This “Gap Funding” would be provided under agreement with DWR and would be subject to reimbursement, similar to previous advances made by certain SWP contractors for planning costs. The reimbursement would occur at the time of DWR’s first issuance of bonds, anticipated in mid-2018.

## **G. COSTS TO SANTA CLARA COUNTY**

The cost of the District’s participation in the WaterFix will depend on the ultimate split between the SWP and CVP, as well as further development of the CVP participation approach and actual market conditions at the time of debt issuance. Staff has estimated costs to Santa Clara County based on the current participation approaches for the SWP and CVP described in Section B and the

participation scenarios described in Section C.3.

*G.1. Total Cost*

Table 2 shows the total financed capital costs of the WaterFix and the District’s potential share under the scenarios described in Section C3. Potential costs are described in terms of both undiscounted costs and present value. Staff used the conservative financing assumptions listed in Table 3. Annual O&M costs are estimated at \$64.4 Million in 2017 dollars. The District’s share of O&M costs would range from \$1.6 to \$2.5 million per year in the scenarios evaluated.

The District’s share of fully financed WaterFix capital costs, in present value dollars, is estimated to range from \$345 million to \$535 million, assuming the participation approaches described in Section B are implemented. These estimates will differ significantly with different assumptions regarding bond structure, inflation rates, and interest rates.

**Table 2. Range of potential WaterFix capital costs to Santa Clara County (a)**

WaterFix Participation Scenario	Total Water Facility and Mitigation Capital Co		
	Construction cost (2017 \$M)	Undiscounted (\$M)	Present Value (\$M)
<b>WaterFix Total</b>	<b>16,730</b>	<b>40,150</b>	<b>13,850</b>
<b>WaterFix - SCVWD share:</b>			
• <b>Balanced Participation</b>	<b>420</b>	<b>1,005</b>	<b>345</b>
• <b>Higher CVP</b>	<b>605</b>	<b>1,455</b>	<b>500</b>
• <b>Higher SWP</b>	<b>650</b>	<b>1,555</b>	<b>535</b>

- a) The District’s share of O&M costs would range from \$1.6 to \$2.5 million per year in the scenarios evaluated. Mitigation O&M begins in 2021 and water facility O&M begins in 2034.
- b) The present value analysis assumes a discount rate of 5.5%, which is equal to an assumed risk-free rate of 2.5% plus a 3% inflation rate, which is consistent with the District’s standard present-value assumptions.

**Table 3. Key financing assumptions used to estimate costs to Santa Clara County**

Key Financing Assumptions	
Type of Bond	Tax-exempt fixed rate bonds
Amortization Period	30 years
Debt Service pattern	Level debt service with 12 months capitalized interest
Annual Inflation Factor	3%
Interest rates	MMD* + 1.65%; approximately 5%
Debt Service Reserve	1 x maximum annual debt service
Present Value Discount Rate	5.5%

\*MMD = municipal market data

**G.2. Incremental costs**

Table 4 provides estimates of the cost per acre foot of incremental WaterFix supply as a “levelized” unit cost; this is the unit cost that, if assigned to every unit of water produced over a 100 year operating period, will produce sufficient revenue to recover the cost of the project in present value terms. The levelized unit cost is expressed in constant 2017 dollars. The cost of the project includes both the total capital cost of the project as well as the present value of O&M over 100 years of operation and the cost of power needed to deliver the water to Santa Clara County.

**Table 4. Levelized unit cost**

WaterFix Participation Scenario	Potential Average Project Yield (AF per year) (a)	Levelized Unit Cost (2017 \$/AF) (b)
Balanced Participation	\$28,500	\$598
Higher CVP	\$41,400	\$598
Higher SWP	\$44,250	\$598

(a) Yield is expressed relative to the base case described in Section C3.

(b) Note the levelized unit cost is the same for all three participation scenarios because the changes caused by changing participation levels are offset by corresponding changes in yield.

*G.3. Impacts on Santa Clara County ratepayers*

The District’s share of WaterFix costs for participation in the CVP share of the project would be paid through water rates. Costs for participation in the SWP share of the project could be repaid through water rates, the ad valorem State Water Project tax, or a combination of the two. The decision on whether to use the ad valorem tax for the District’s SWP share of WaterFix costs will be influenced by the outcome of potential litigation regarding DWR’s authority to build the WaterFix as a component of the State Water Project.

Staff estimated the incremental cost impact to ratepayers in fiscal year 2027 under two scenarios; 1) all WaterFix costs are repaid through water rates; and 2) the SWP portion of WaterFix costs is recovered through the ad valorem tax. The results are shown in Tables 5 and 6.

**Table 5. Estimated incremental impact of WaterFix on District groundwater charges and Santa Clara County monthly household costs without use of the SWP tax for fiscal year 2027.**

	Balanced Participation	Higher CVP	Higher SWP
<b>M&amp;I groundwater charge increase (\$/AF)</b>			
north county	\$109	\$165	\$192
south county	\$40	\$81	\$40
<b>Total increase per average household (\$/month)</b>			
north county	\$3.80	\$5.70	\$6.60
south county	\$1.40	\$2.80	\$1.40

**Table 6. Estimated incremental impact of WaterFix on District groundwater charges, SWP tax and Santa Clara County monthly household costs with use of the SWP tax for fiscal year 2027.**

	Balanced Participation	Higher CVP	Higher SWP
<b>M&amp;I groundwater charge increase (\$/AF)</b>			
north county	\$47	\$87	\$47
south county	\$24	\$68	\$12

<b>SWP tax increase, average single family (\$/yr)</b>			
north county increase	\$19.90	\$19.90	\$39.80
south county	\$15.30	\$15.30	\$30.60
<b>Total increase per average household (\$/month)</b>			
north county	\$3.30	\$4.70	\$4.90
south county	\$2.10	\$3.60	\$3.00

**H. Next Steps**

Staff will continue to engage in discussions to develop documents and agreements that develop the WaterFix participation structure. Staff will bring key term sheets and agreements to the Board for review prior to requesting the Board to make a decision on involvement with the WaterFix on October 10, 2017.

Staff’s presentation will be provided with a supplemental memo.

**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:**

- \*Supplemental Agenda Memo
- \*Supplemental Attachment 1: PowerPoint
- \*Supplemental Attachment 2: Supporting Info PowerPoint
- \*Supplemental Attachment 3: Response to August 22, 2017 Questions
- \*Supplemental Attachment 4: Board Communications List
- \*Supplemental Attachment 5: WaterFix Financial Risks
- \*Handout 2.1-A - K. Irvin

**UNCLASSIFIED MANAGER:**

Jerry De La Piedra, 408-630-2257

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**File No.:** 17-0615

**Agenda Date:** 9/12/2017

**Item No.:** \*2.1.

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## SUPPLEMENTAL BOARD AGENDA MEMORANDUM

### **SUBJECT:**

California WaterFix Update, Including Water Supply Analysis, Cost and Water Allocation, and Financing.

### **REASON FOR SUPPLEMENTAL MEMORANDUM:**

This supplemental memo conveys additional information identified after the initial memo was released, consistent with Executive Limitations Policy EL-7-10-5.

### **RECOMMENDATION:**

Receive and discuss information on the California WaterFix, including a water supply analysis, cost and water allocations, and financing.

### **SUMMARY:**

This Supplemental Memorandum is to convey the staff PowerPoint presentation and supporting materials (Attachments 1 and 2), as well as to respond to questions and concerns raised during the August 22, 2017 Board meeting (Attachment 3), and provide a list of the open, public Board meetings and workshops that have been held on the Bay Delta Conservation Plan and California WaterFix since 2011 (Attachment 4).

In addition, Curt Schmutte, a consulting engineer who regularly leads tours of the Delta, will provide a presentation on the current state of the Delta.

### **Curt Schmutte, Consulting Engineer:**

Mr. Schmutte is a registered civil engineer who has 30 years of experience working on Bay-Delta issues, including over 20 years at the Department of Water Resources (DWR) working on levee improvement programs, land subsidence research, economic risk analyses, seismic flood risk mitigation strategies, and habitat restoration projects. He managed DWR's levee program as well as the North Delta flood control and ecosystem restoration project and the Suisun Marsh ecosystem restoration effort. As levee program manager for DWR, Mr. Schmutte initiated the Delta Risk Management Strategy project. He also served as an expert witness on the Jones Tract levee failure litigation. Mr. Schmutte was the manager of habitat restoration projects for the State and Federal Contractors Water Agency (SFCWA). He is also

---

a consultant to Metropolitan Water District of Southern California on delta levee, Yolo Bypass, ecosystem restoration, hydrodynamic modeling and emergency response planning efforts.

**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: Staff PowerPoint
- Attachment 2: Supporting Information PowerPoint
- Attachment 3: Response to August 22, 2017 Questions
- Attachment 4: Board Communications List
- Attachment 5: WaterFix Financial Risks

**UNCLASSIFIED MANAGER:**

Jerry De La Piedra, 408-630-2257

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# California WaterFix Update

## SCVWD Board Meeting

### September 12, 2017



Attachment 4, Page 23 of 84



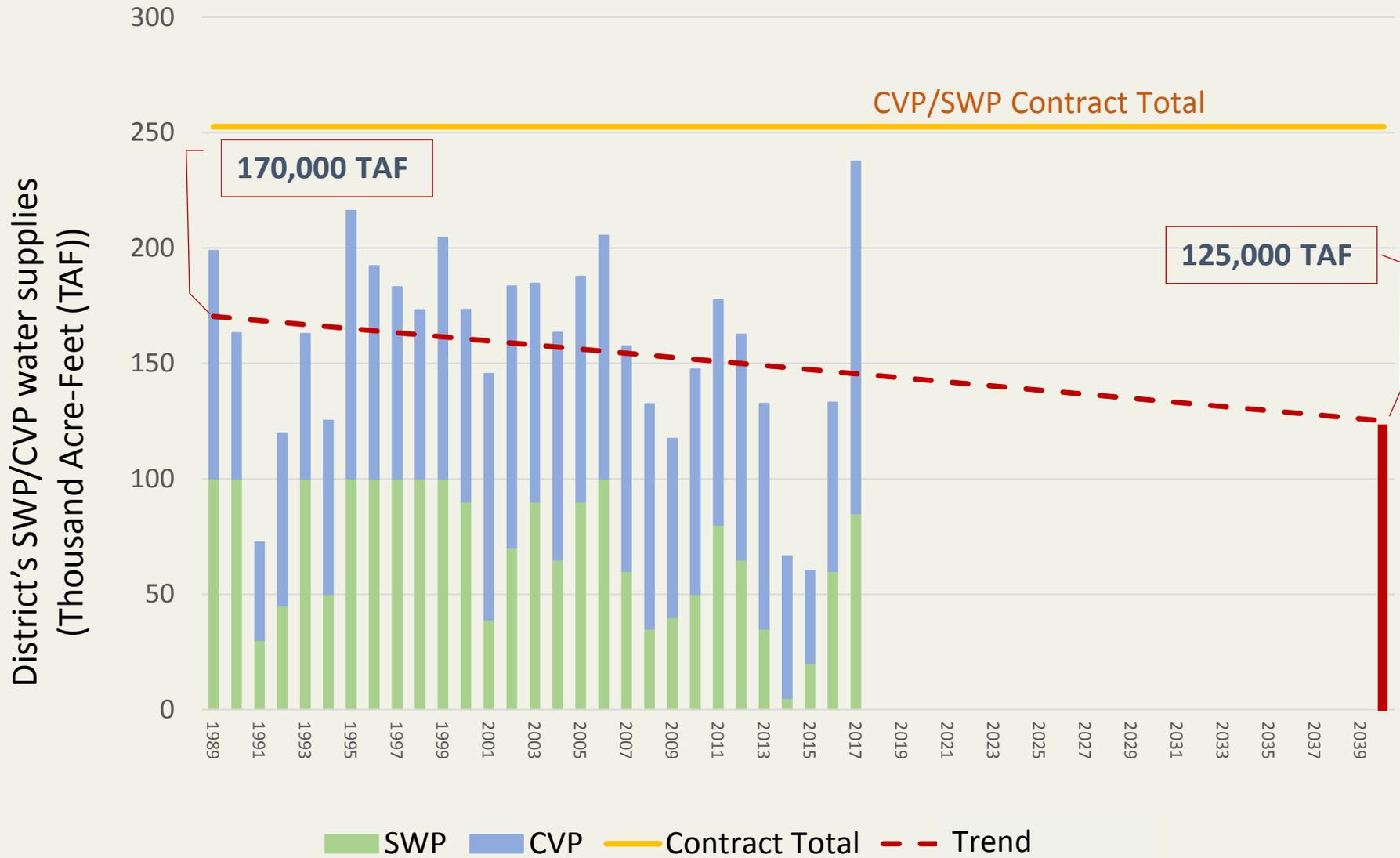
Imported water is important to Silicon Valley:

- ❖ **Has seen us through droughts**
- ❖ **Protects Silicon Valley's infrastructure from damage** due to sinking land levels
- ❖ Supports Silicon Valley's **world-leading economy**

However supplies are at risk. WaterFix is **one of the least expensive solutions** to sustain existing supplies. It plans to:

- ❖ **Upgrade aging infrastructure**
- ❖ Protect the **environment, fish and wildlife**
- ❖ Keep our water **clean, safe and healthy**

# The current path leads to less imported water in the future



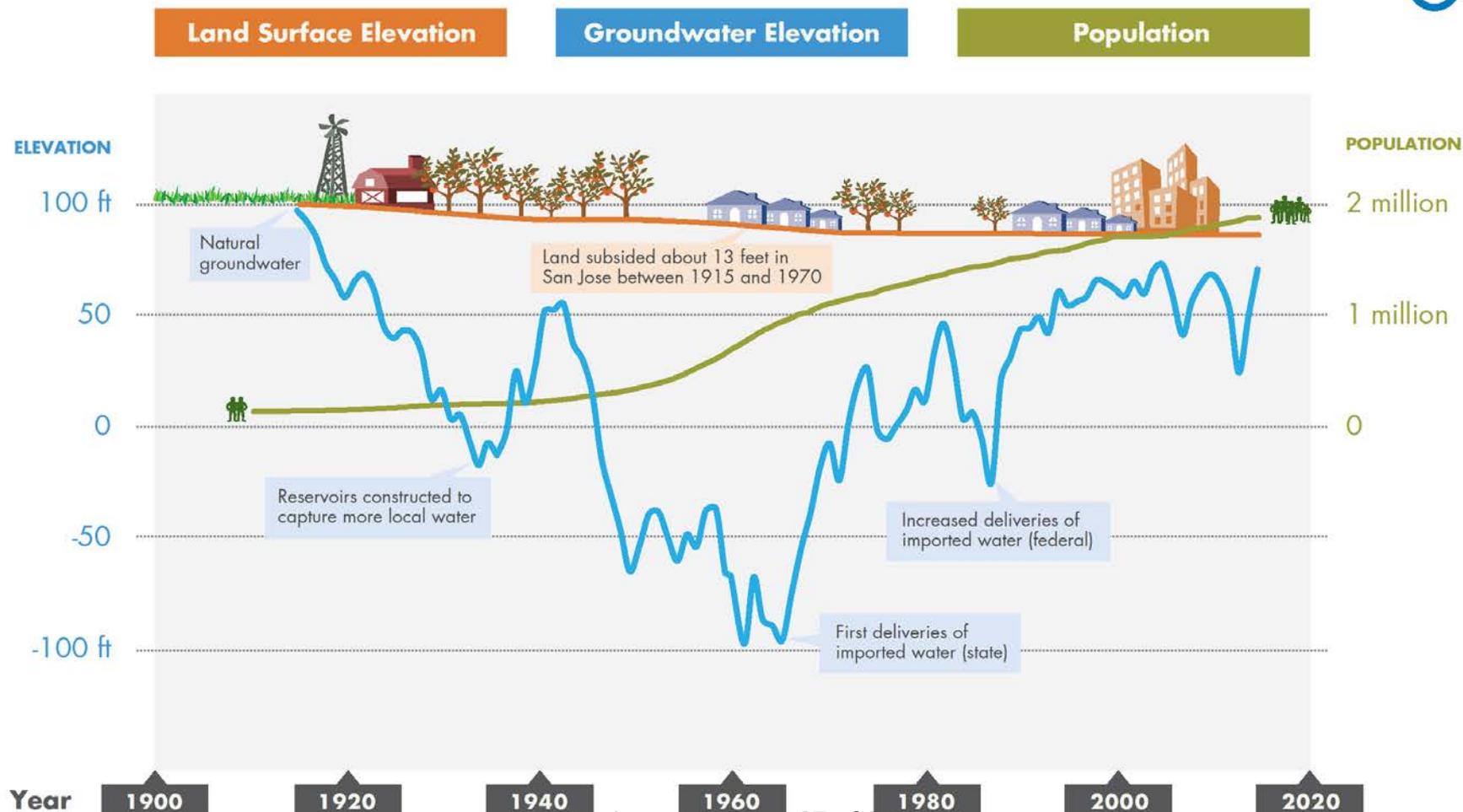
# California WaterFix is one of the least expensive supply options

<b>Water Supply Option</b>	<b>Cost/AF</b>
No Regrets (Stormwater, gray water, more conservation)	<b>\$300</b>
Morgan Hill Recharge	<b>\$400</b>
<b>California WaterFix</b>	<b>\$600</b>
Sites Reservoir	<b>\$800</b>
Imported Water Contract Purchase	<b>\$800</b>
Lexington Pipeline	<b>\$1,000</b>
Saratoga Recharge	<b>\$1,300</b>
Dry Year Options/Transfers	<b>\$1,400</b>
Potable Reuse – Los Gatos Ponds	<b>\$1,700</b>
Potable Reuse – Injection Wells	<b>\$2,000</b>
Los Vaqueros Reservoir	<b>\$2,300</b>
Potable Reuse - Ford Pond	<b>\$2,500</b>
Pacheco Reservoir	<b>\$2,700</b>
Groundwater Banking	<b>\$5,700</b>

# WaterFix is designed to secure existing supplies and reduce shortages during droughts

## SANTA CLARA COUNTY GROUNDWATER AT-A-GLANCE

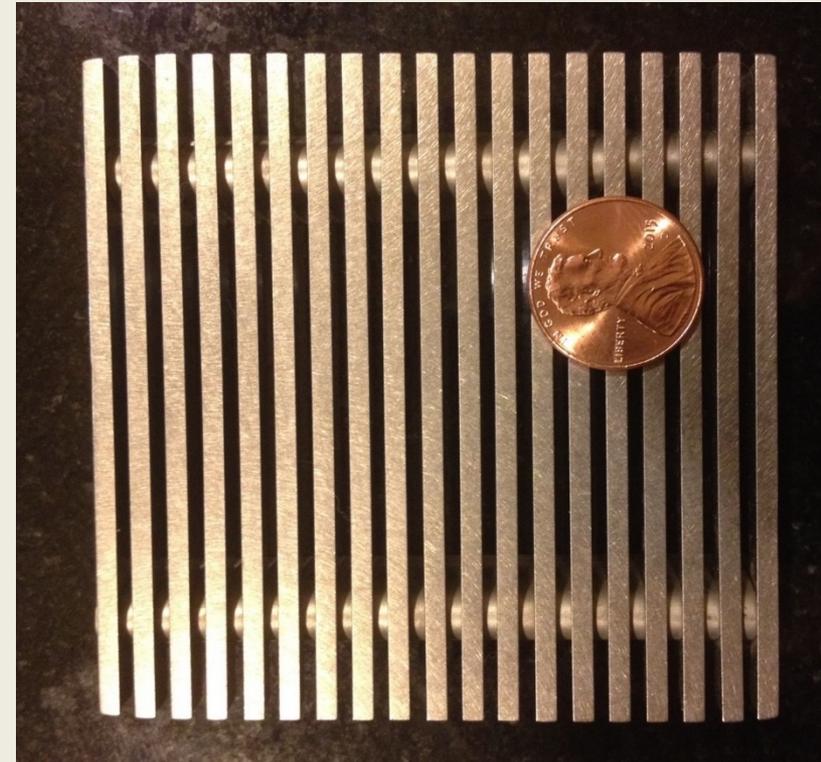
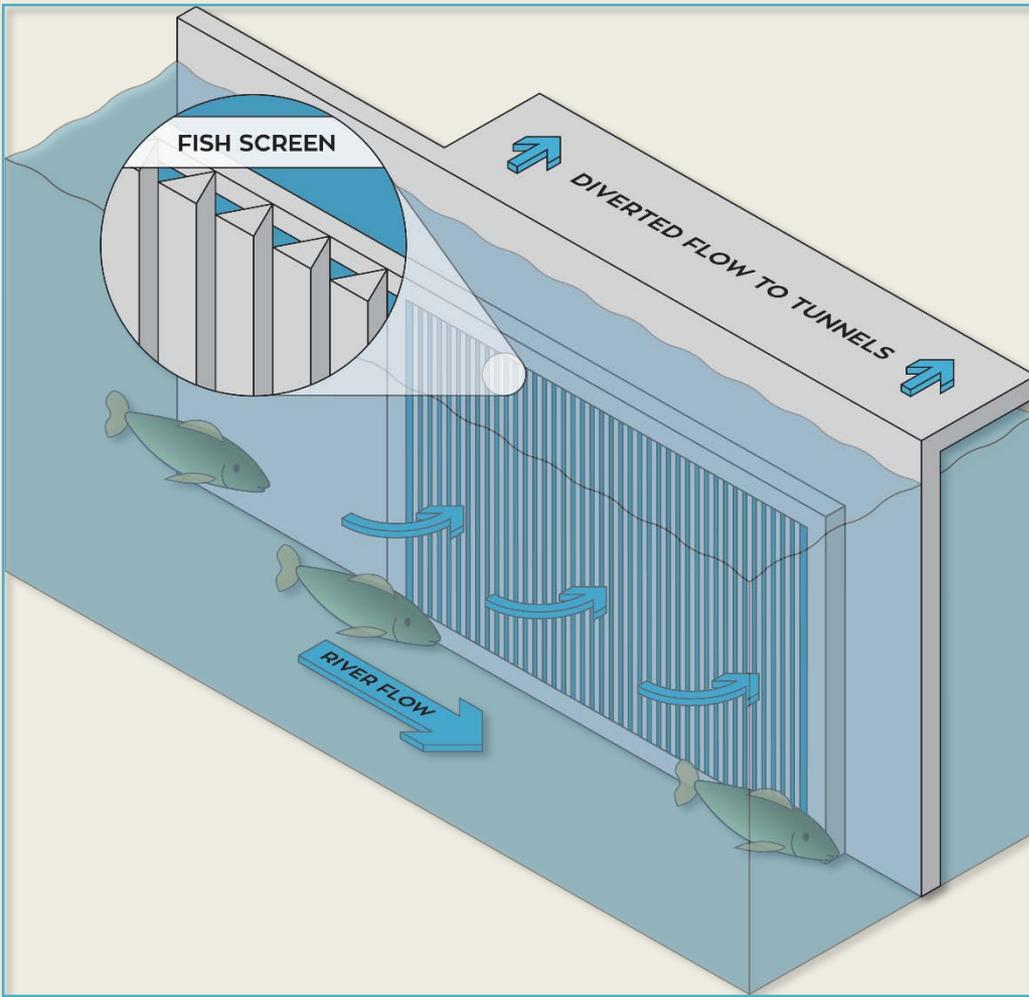
*a graphic representation not intended as a technical exhibit*



# WaterFix will upgrade aging infrastructure to protect Silicon Valley's water supply



# WaterFix improves flows patterns to protect fish and wildlife in the Delta, and thus protects Silicon Valley's water supplies



# WaterFix will help keep our water safe and clean



- ❖ Safeguards against rising seas
- ❖ Improves water quality

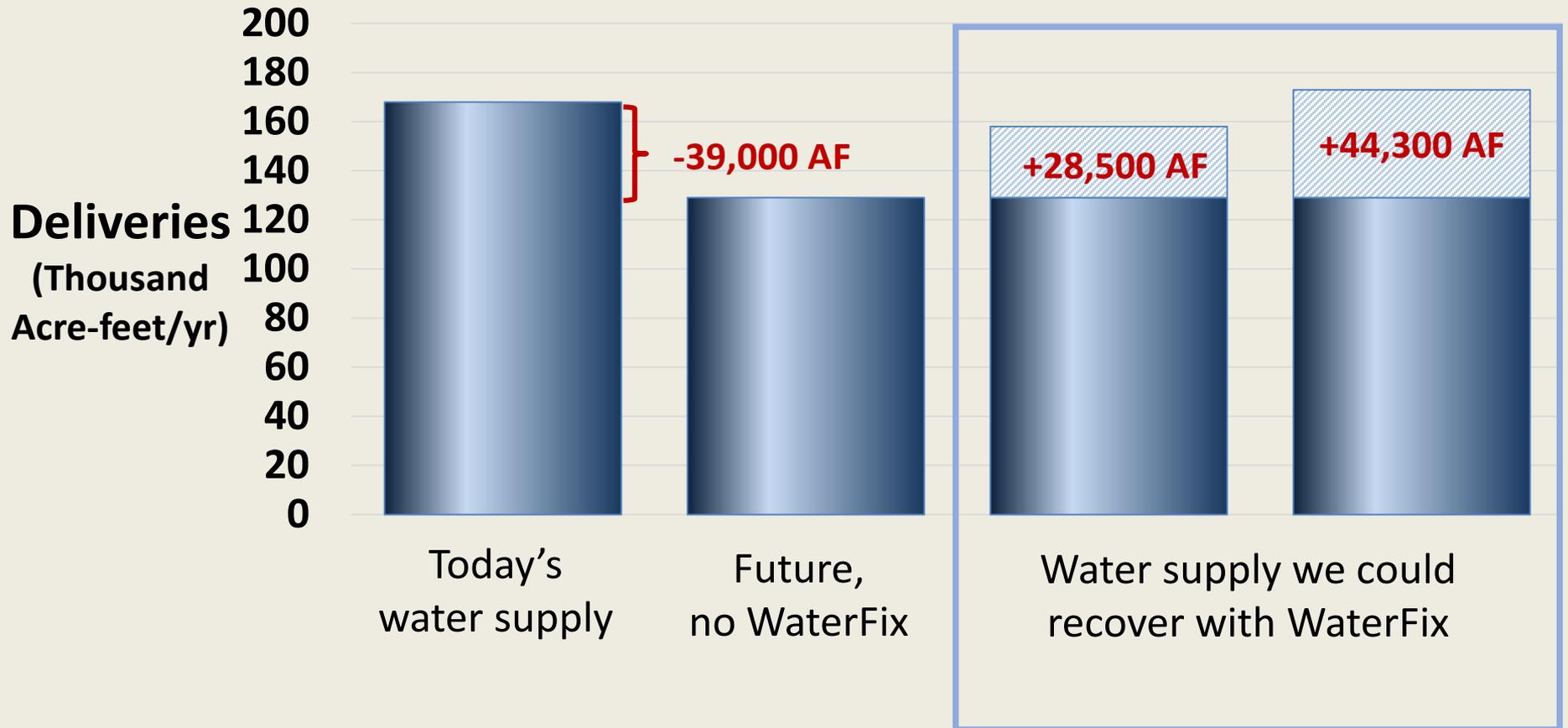
# Silicon Valley needs sufficient water to thrive

- ❖ If we don't participate, water that would come to Silicon Valley becomes available to other agencies to purchase.



# Water supply benefits vary based on level of participation

## Modeled Long-Term Average



# WaterFix capital and annual operation and maintenance costs (2017 dollars)

## **TOTAL Project Costs**

**Capital Costs** **\$16.7 Billion**

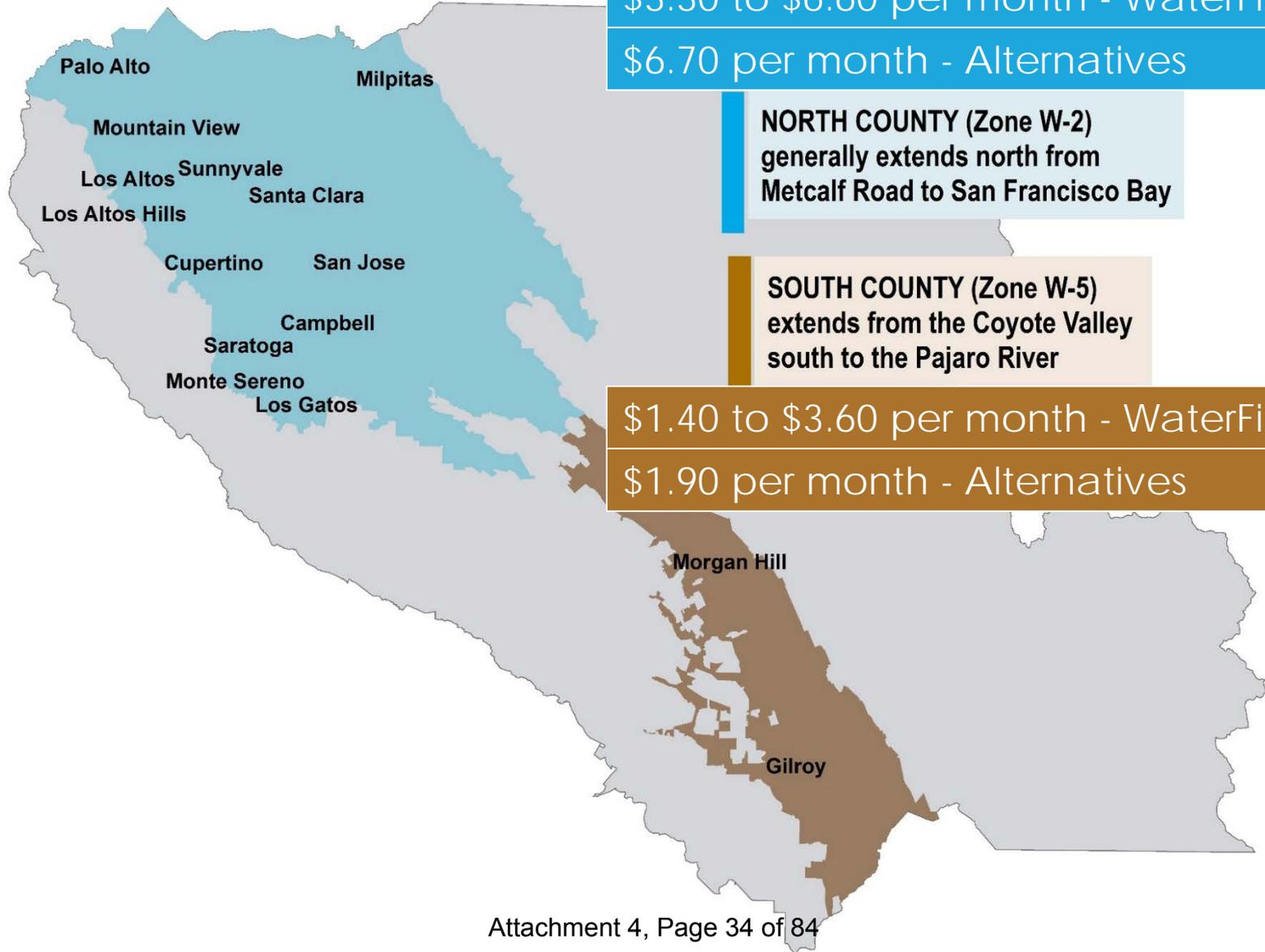
**Operations and Maintenance Costs** **\$64.4 Million/Yr**

## **DISTRICT Share of Project Costs**

**Capital Costs** **\$420 – 650 Million**

**Operations and Maintenance Costs** **\$1.6 - \$2.5 Million/Yr**

# Average monthly household cost of WaterFix (FY 2027)



# The project has significant uncertainties

- ❖ Cost uncertainty
- ❖ Financing
- ❖ Validation action
- ❖ Permitting delays and additional regulatory constraints
- ❖ Uncertain federal involvement
- ❖ Other participant decisions
- ❖ Litigation

- ❖ Two channels of participation (State and Federal)
- ❖ Reducing uncertainties through agreements
- ❖ Some uncertainties will be resolved in the first two years
- ❖ Continued planning for alternative projects

# Board communication & decision schedule

- ❖ 28 open, public Board meetings and workshops since 2011
- ❖ 19 open, public Bay Delta Conservation Plan Ad Hoc Committee meetings between 2013 and 2016
- ❖ Numerous presentations to District advisory committees

Date	Topic
<b>Sep. 12 (Today)</b>	<b>WaterFix update, including water supply analysis, cost, and financing</b>
Sept. 19	Workshop on Water Supply Master Plan
Oct. 3	Workshop to review draft agreements, term sheets, including financing and governance
Oct. 10	Board decisions on involvement with and/or participation in the WaterFix

Imported water is important to Silicon Valley:

- ❖ Has **seen us through droughts**
- ❖ **Protects Silicon Valley's infrastructure** from massive damage
- ❖ Supports Silicon Valley's **world-leading economy**

WaterFix is **one of the least expensive solutions** to sustain existing supplies. It plans to:

- ❖ **Upgrade aging infrastructure**
- ❖ **Protect the environment**, fish and wildlife
- ❖ Keep our water **clean, safe and healthy**

However, there are **significant uncertainties** to be resolved

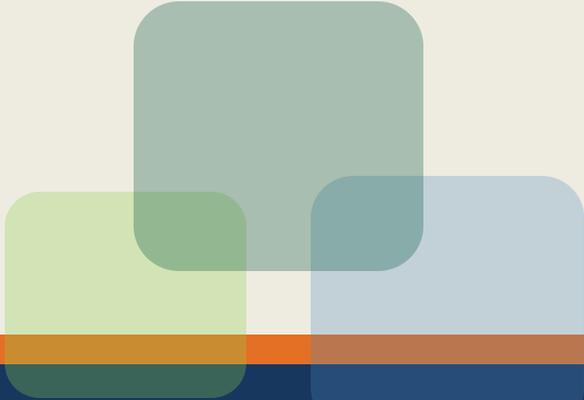
# Current Status of the Delta



Guest speaker: Conditions in the Delta related to the environment, earthquake risk, and other aspects.

## **Curt Schmutte, Consulting Engineer**

- ❖ 30 years of experience working on Bay-Delta issues
- ❖ 20 years at the Department of Water Resources (DWR) working on levee improvement programs, land subsidence research, economic risk analyses, seismic flood risk mitigation strategies, and habitat restoration projects.
- ❖ Managed several Bay-Delta habitat restoration projects for DWR and the State and Federal Contractors Water Agency



California WaterFix Update:  
Water Supply and Cost Analysis Supporting Information  
SCVWD Board Meeting  
September 12, 2017



Attachment 4, Page 41 of 84



# Water Supply Analysis



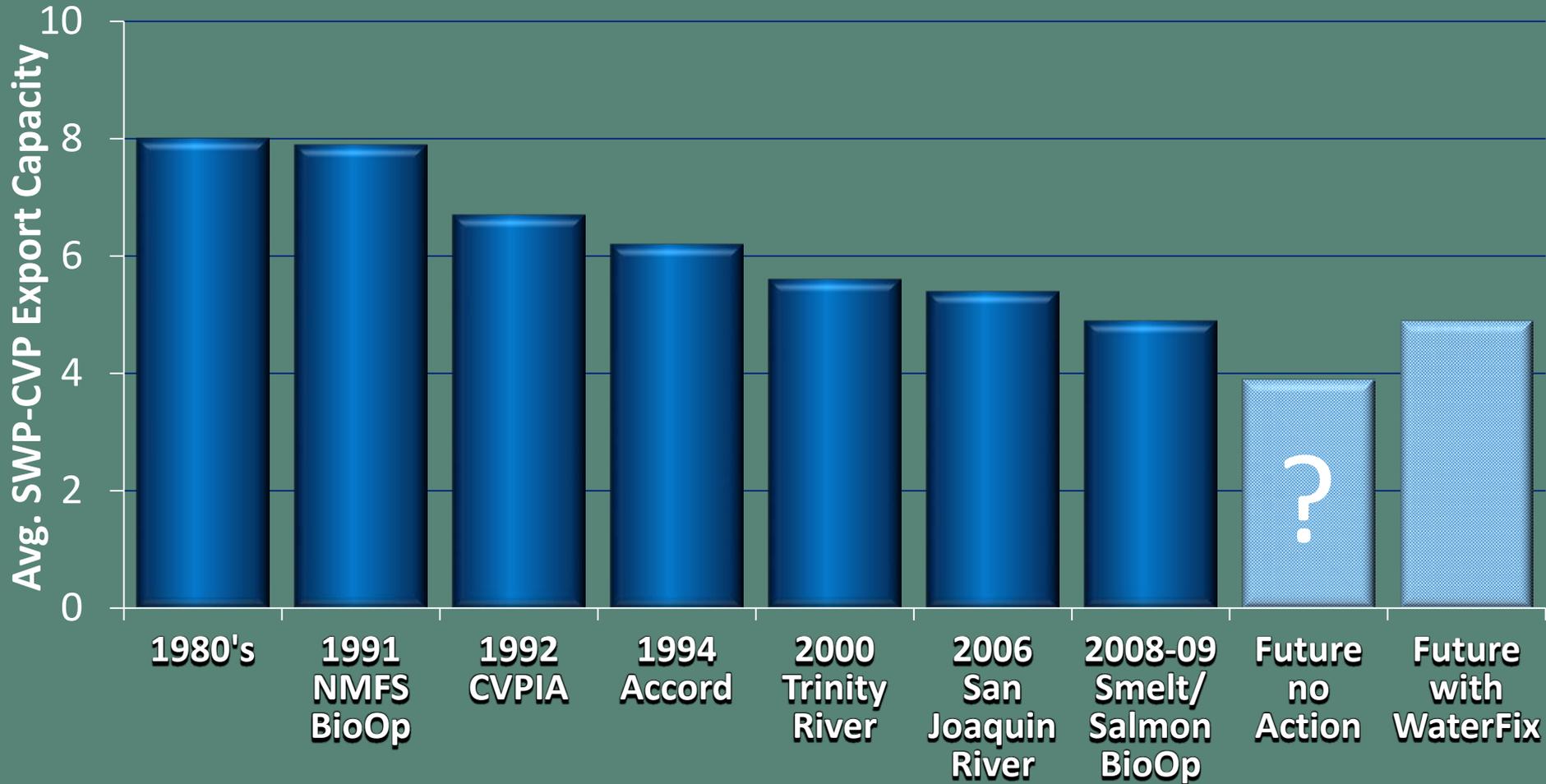
Attachment 4, Page 42 of 84



Attachment 2, Page 2 of 25

WaterFix is intended to protect Santa Clara County's existing water supplies; it does not create new water supplies

## Modeled long-term average SWP/CVP exports (million acre-ft/yr)



Participation scenarios evaluated:

1. **Balanced Participation** - 2.5% SWP and 2.5% CVP
2. **Higher Central Valley Project** - 2.5% SWP and 5% CVP
3. **Higher State Water Project** - 5% SWP and 2.5% CVP

**Base Case** – more restricted future operations, no WaterFix

Water supply assumptions include:

- ❖ Completion of dam seismic retrofits
- ❖ Retailers continue development of non-potable recycled water, cumulatively 32,000 acre-feet per year by 2040
- ❖ Conservation savings continue on track to 99,000 acre-feet by 2040
- ❖ Implementation of “No Regrets” actions
  - Includes graywater, leak repair, advanced metering infrastructure, stormwater recharge, ag land recharge, rain gardens, rain barrels

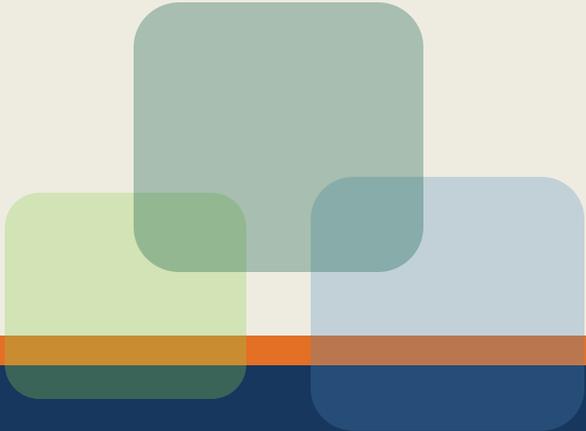
# Significant improvement in the District's imported water quality is expected

Total Dissolved Solids (milligrams per liter)



- ❖ 19-22% reduction in salt in District's SWP/CVP imported water
- ❖ 18% reduction in total salt load to groundwater in northern Santa Clara County
- ❖ Statewide \$1.8 billion benefit to urban and agricultural users  
(Source: Bay Delta Conservation Plan Public Draft, November 2013, Appendix 9.A *Economic Benefits of the BDCP and Take Alternatives*)

- ❖ Analyses indicate that WaterFix participation scenarios would
  - Increase local groundwater storage
  - Increase Semitropic reserves
  - Reduce frequency and magnitude of shortages



# WaterFix Costs



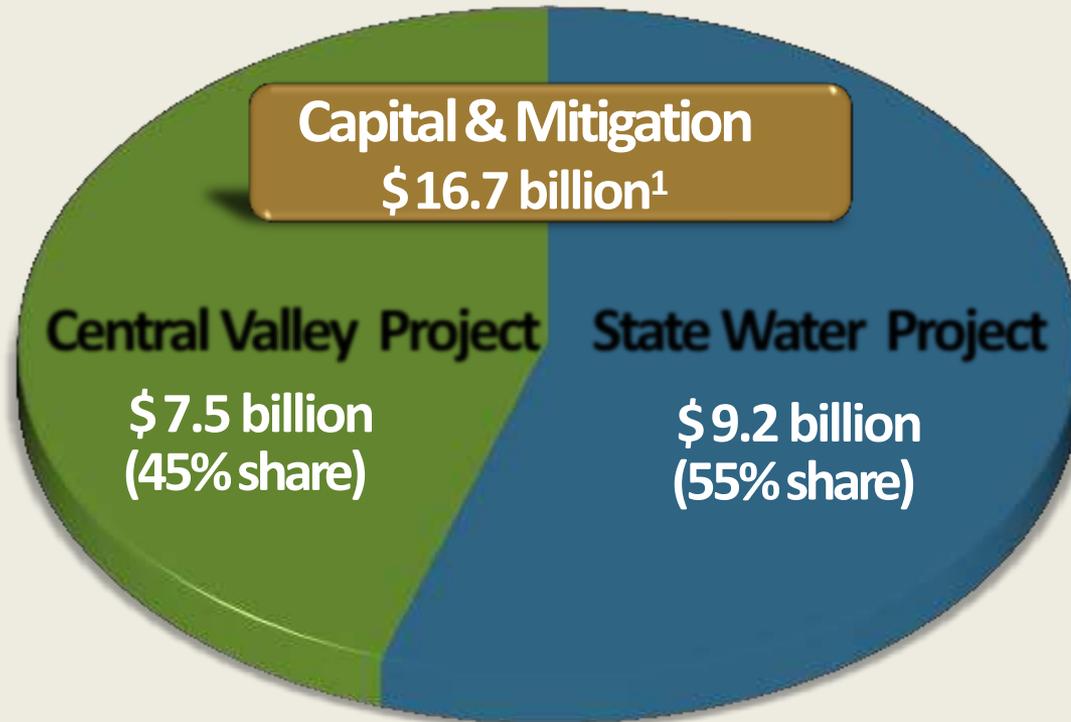
# WaterFix capital costs are estimated to be \$16.7 billion

<b>WaterFix Capital Costs</b>	<b>2014 (\$Billions)</b>	<b>2017 (\$Billions)</b>
<b>Conveyance Facility</b>		
Construction	9.5	10.4
Contingency (36%)	3.4	3.7
Program Management/Construction Management/Engineering	1.9	2.1
Land Acquisition (includes 20% contingency)	.15	.16
<b>Sub-Total</b>	14.9	16.3
<b>Mitigation</b>	.37	.40
<b>Total</b>	<b>\$15.3 B</b>	<b>\$16.7 B</b>

WaterFix annual operations and maintenance costs are estimated to be \$64.4 million

<b>WaterFix Operations and Maintenance Costs</b>	<b>2014 (\$M/yr.)</b>	<b>2017 (\$M/yr.)</b>
Conveyance Facility Operations and Maintenance	20.0	21.9
Power	6.6	7.2
Capital Replacement	13.7	15.0
Sub-Total	40.3	44.1
<b>Mitigation</b>	18.6	20.3
<b>Total</b>	<b>\$58.9M/yr.</b>	<b>\$64.4M/yr.</b>

## WaterFix Capital Cost Share



1. In 2017 dollars

# WaterFix financing assumptions

- ❖ District's share of capital costs is \$345M - \$535M (2017 dollars) depending on level of participation
- ❖ Capital costs are financed through annual issuances of fixed rate bonds; each with a 30-year amortization
- ❖ Estimates subject to bond structure, inflation and interest rates
- ❖ SCVWD's annual share of operations and maintenance costs is \$1.6 million - 2.5 million (2017 dollars)
- ❖ Operations and maintenance costs assume 100 years of operation beginning in 2033
- ❖ Operations and maintenance costs are paid as incurred

# A conservative set of financing assumptions was used to estimate the District's share of WaterFix costs

## Financing technical assumptions:

- ❖ Capital costs are financed through annual issuances of fixed rate bonds; each with a 30-year amortization
- ❖ Fixed rate based on the AAA MMD<sup>1</sup> scale as of July 11, 2017 plus an additional spread of 1.65%
- ❖ Present value analysis assumes an escalation rate of 3% and a discount rate of 5.5%

<sup>1</sup> Thomson Reuters Municipal Market Data AAA yield curve (AAA MMD) represents the market benchmark yield for AAA rated state general obligation bonds.

# WaterFix costs to Santa Clara County could vary based on participation decisions

Participation Scenario	Total Water Facility and Mitigation Capital Costs		
	Construction Costs (2017 \$M)	Undiscounted Financed (\$M)	Present Value Financed (\$M)
WaterFix total capital costs <sup>1</sup>	16,730	40,150	13,850
WaterFix - SCVWD share:			
• Balanced Participation (2.5% SWP/2.5% CVP)	420	1,005	345
• Higher CVP (2.5%SWP/5% CVP)	605	1,455	500
• Higher SWP (5%SWP/2.5%CVP)	650	1,555	535

1. Total annual WaterFix operations and maintenance costs are \$64.4 M/yr in 2017 dollars. The District's share would range from \$1.6 M/yr to \$2.5 M/yr.

# Levelized unit cost estimate in constant 2017 dollars

Participation Scenario	Levelized Unit Cost <sup>1</sup> (2017 \$/AF)
Balanced Participation	600
Higher CVP	600
Higher SWP	600

<sup>1</sup> Levelized unit cost = unit cost that, when assigned to every unit of water produced over a 100 year operating period, will equal the present value cost of the project. Expressed in constant 2017 dollars.

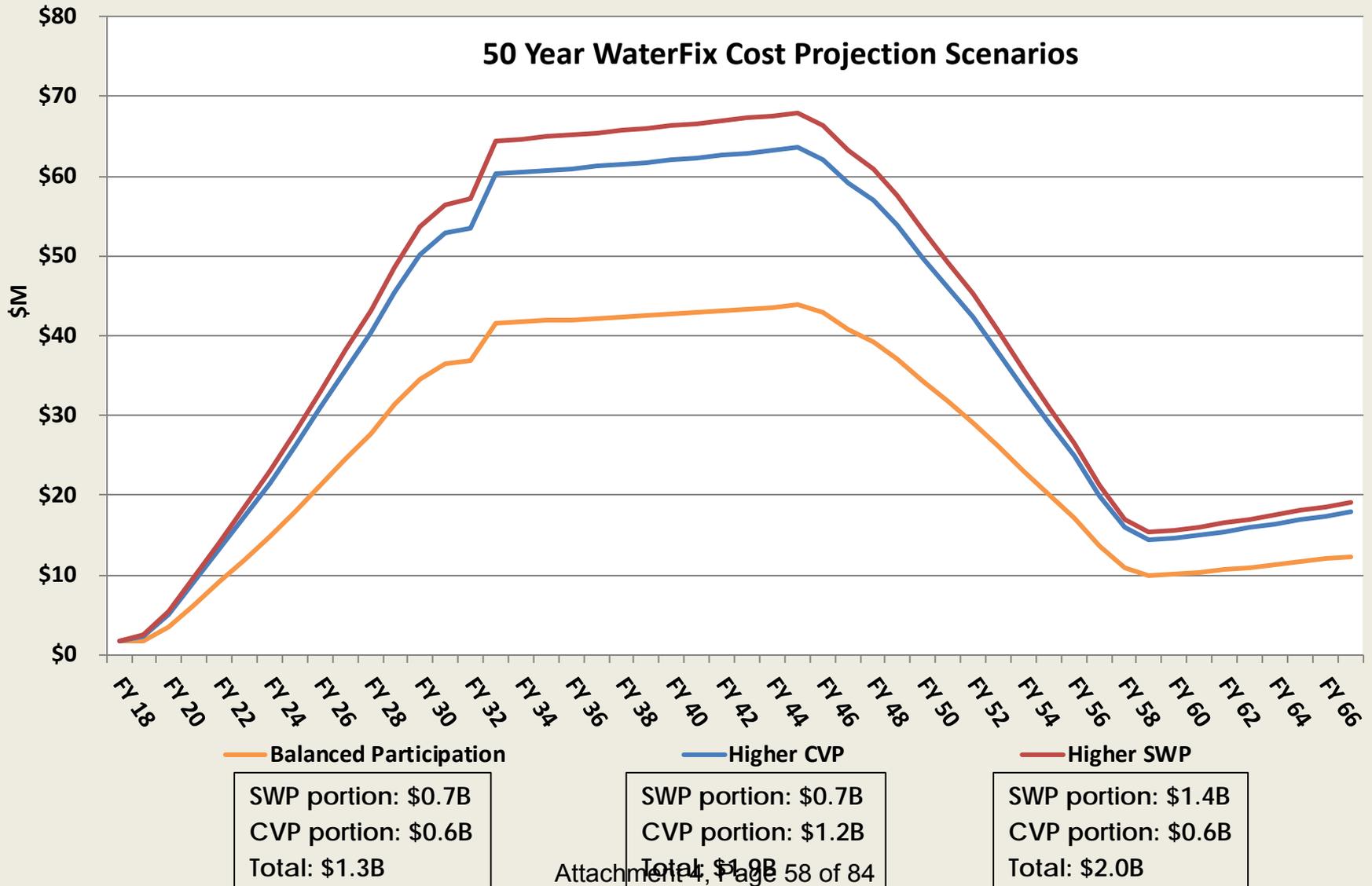
# Ratepayer impacts without use of the State Water Project Tax (FY 2027)

	Incremental Cost Increase		
	WaterFix Scenarios		
	Balanced Participation	Higher CVP	Higher SWP
<b>M&amp;I groundwater charge increase (\$/AF)</b>			
north county	<b>\$109</b>	<b>\$165</b>	<b>\$192</b>
south county	<b>\$40</b>	<b>\$81</b>	<b>\$40</b>
<b>Total increase per average household (\$/month)</b>			
north county	<b>\$3.80</b>	<b>\$5.70</b>	<b>\$6.60</b>
south county	<b>\$1.40</b>	<b>\$2.80</b>	<b>\$1.40</b>

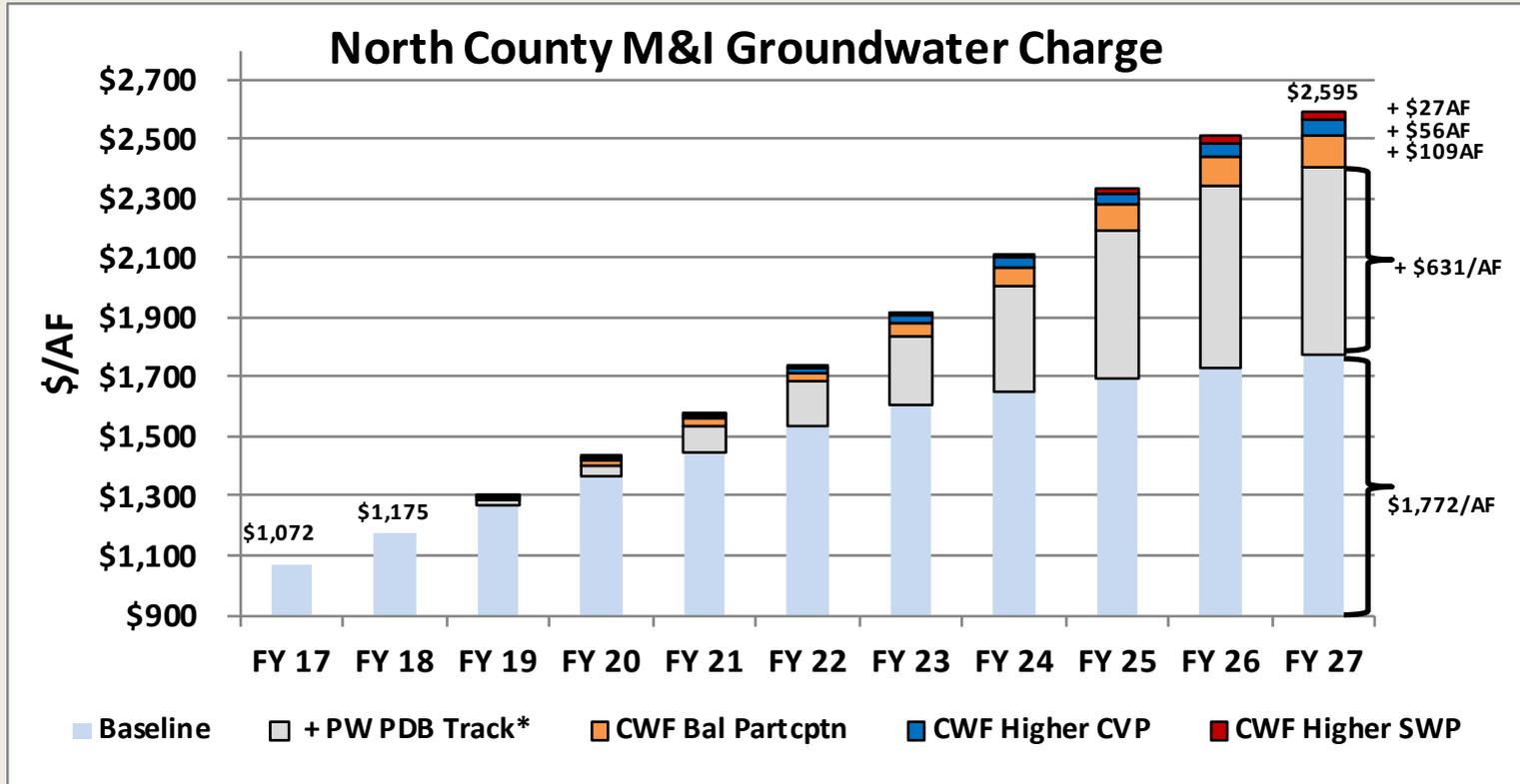
# Ratepayer impacts with use of the State Water Project Tax (FY 2027)

	Incremental Cost Increase		
	WaterFix Scenarios		
	Balanced Participation	Higher CVP	Higher SWP
<b>M&amp;I groundwater charge increase (\$/AF)</b>			
north county	<b>\$47</b>	<b>\$87</b>	<b>\$47</b>
south county	<b>\$24</b>	<b>\$68</b>	<b>\$12</b>
<b>SWP tax increase per average single family (\$/yr)</b>			
north county	<b>\$19.90</b>	<b>\$19.90</b>	<b>\$39.80</b>
south county	<b>\$15.30</b>	<b>\$15.30</b>	<b>\$30.60</b>
<b>Total increase per average household (\$/month)</b>			
north county	<b>\$3.30</b>	<b>\$4.70</b>	<b>\$4.90</b>
south county	<b>\$2.10</b>	<b>\$3.60</b>	<b>\$3.00</b>

# WaterFix scenarios result in peak annual costs ranging from approximately \$44 million to \$66 million

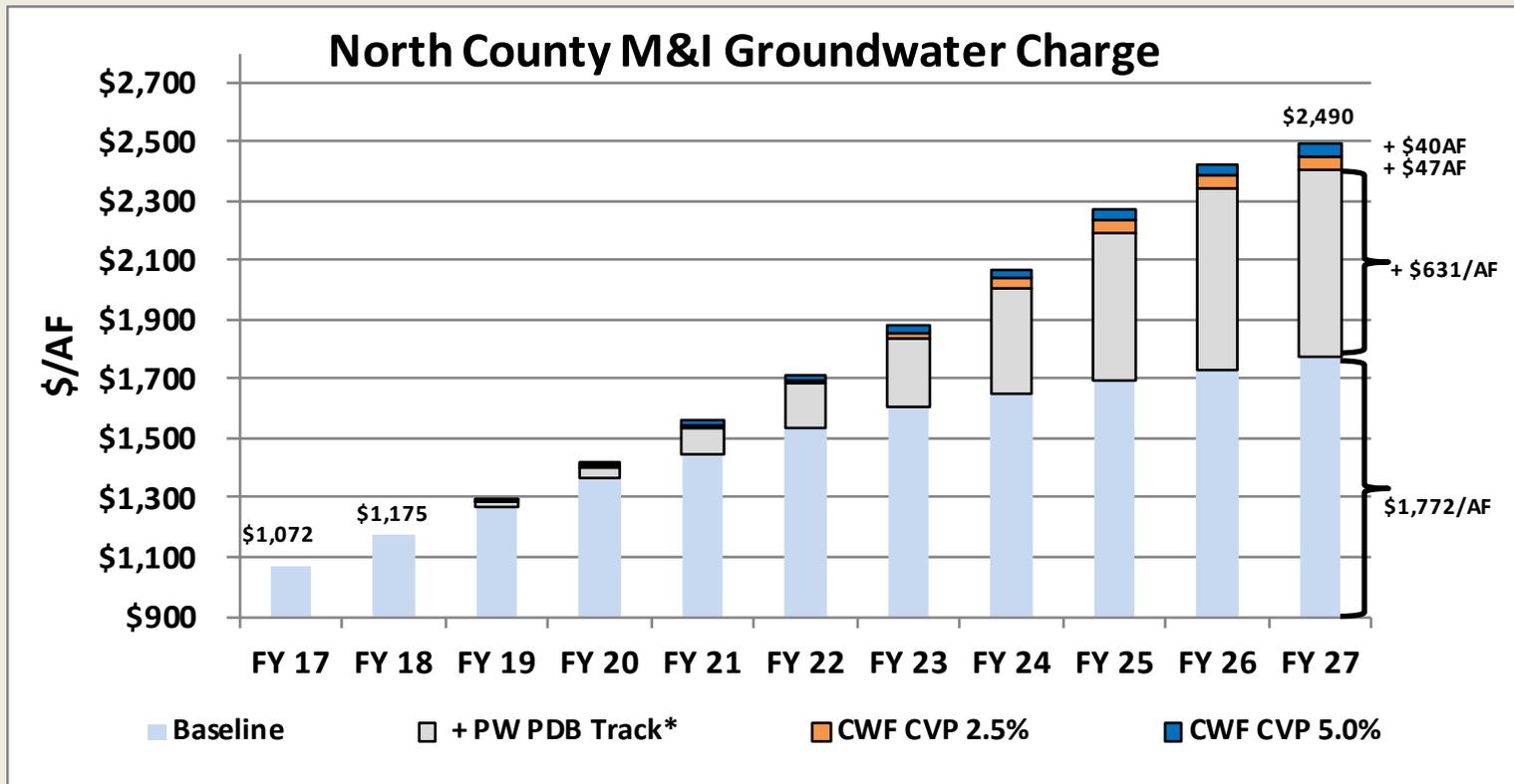


# 10-year rate projection assuming no State Water Project tax used for WaterFix (CWF)

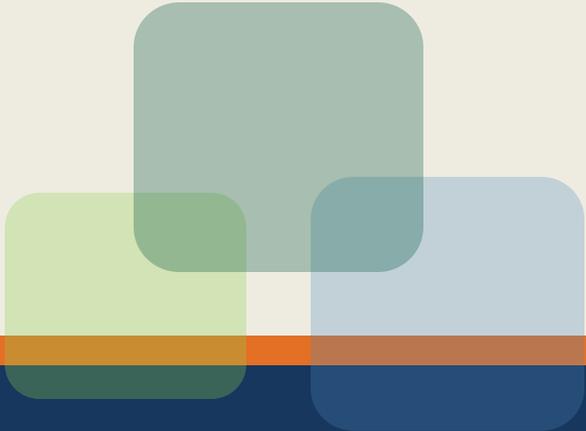


Annual % Increase	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27
<b>Baseline</b>	8.1%	7.6%	6.1%	5.9%	4.5%	3.1%	2.5%	2.3%	2.3%
<b>+ PW PDB Track*</b>	9.4%	9.4%	9.4%	9.4%	9.3%	9.3%	9.2%	6.6%	2.7%
<b>CWF Bal Partcptn</b>	9.9%	9.9%	9.9%	9.9%	9.9%	9.9%	9.9%	7.2%	2.9%
<b>CWF Higher CVP</b>	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%	7.4%	3.2%
<b>CWF Higher SWP</b>	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	7.8%	3.2%

# 10-year rate projection assuming State Water Project tax is used for WaterFix (CWF)



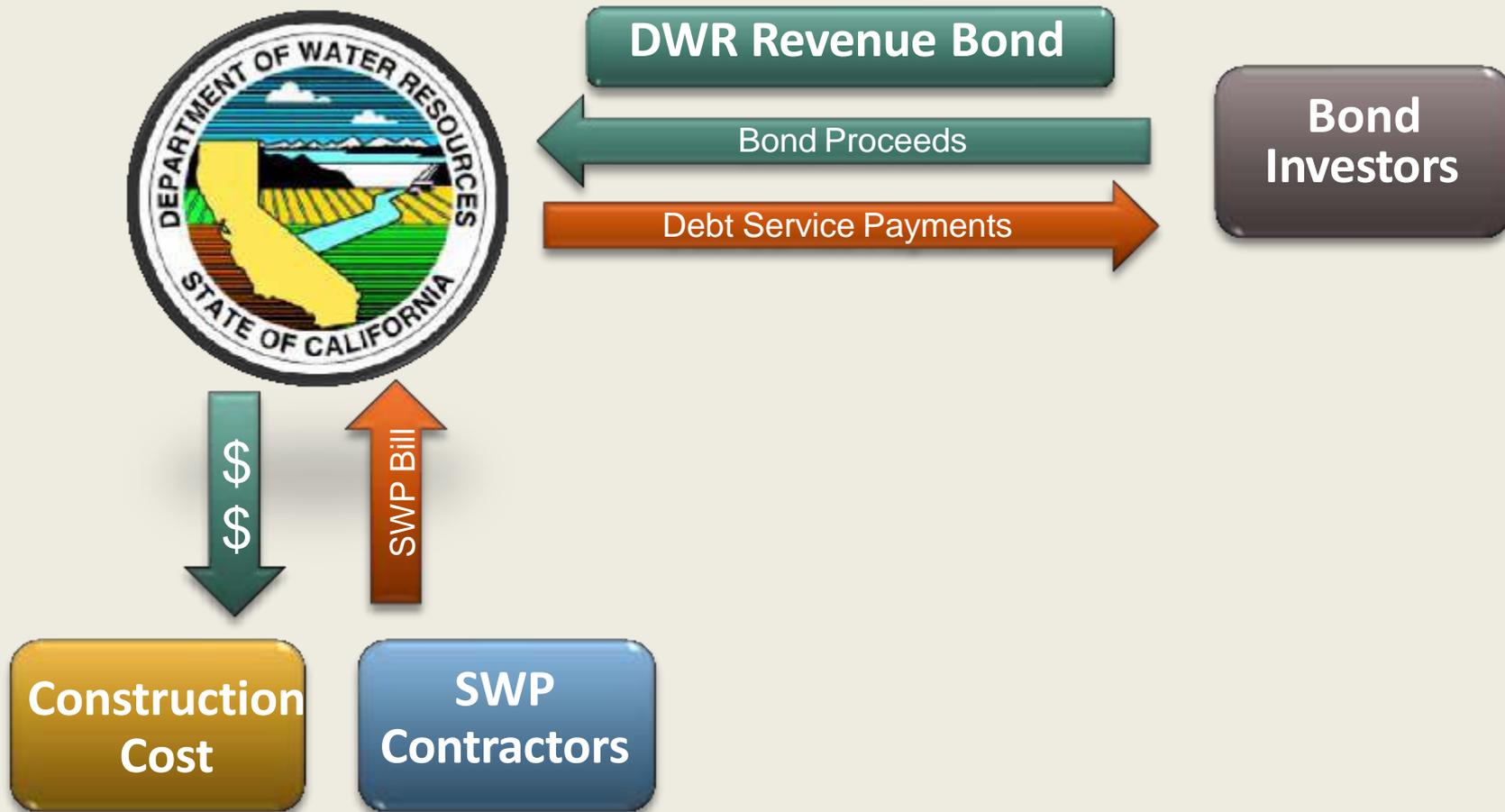
Annual % Increase	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27
<b>Baseline</b>	8.1%	7.6%	6.1%	5.9%	4.5%	3.1%	2.5%	2.3%	2.3%
<b>+ PW PDB Track*</b>	9.4%	9.4%	9.4%	9.4%	9.3%	9.3%	9.2%	6.6%	2.7%
<b>CWF CVP 2.5%</b>	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	6.8%	2.7%
<b>CWF CVP 5.0%</b>	9.9%	9.9%	9.9%	9.9%	9.9%	9.9%	9.9%	6.6%	2.7%



# Financing Approach



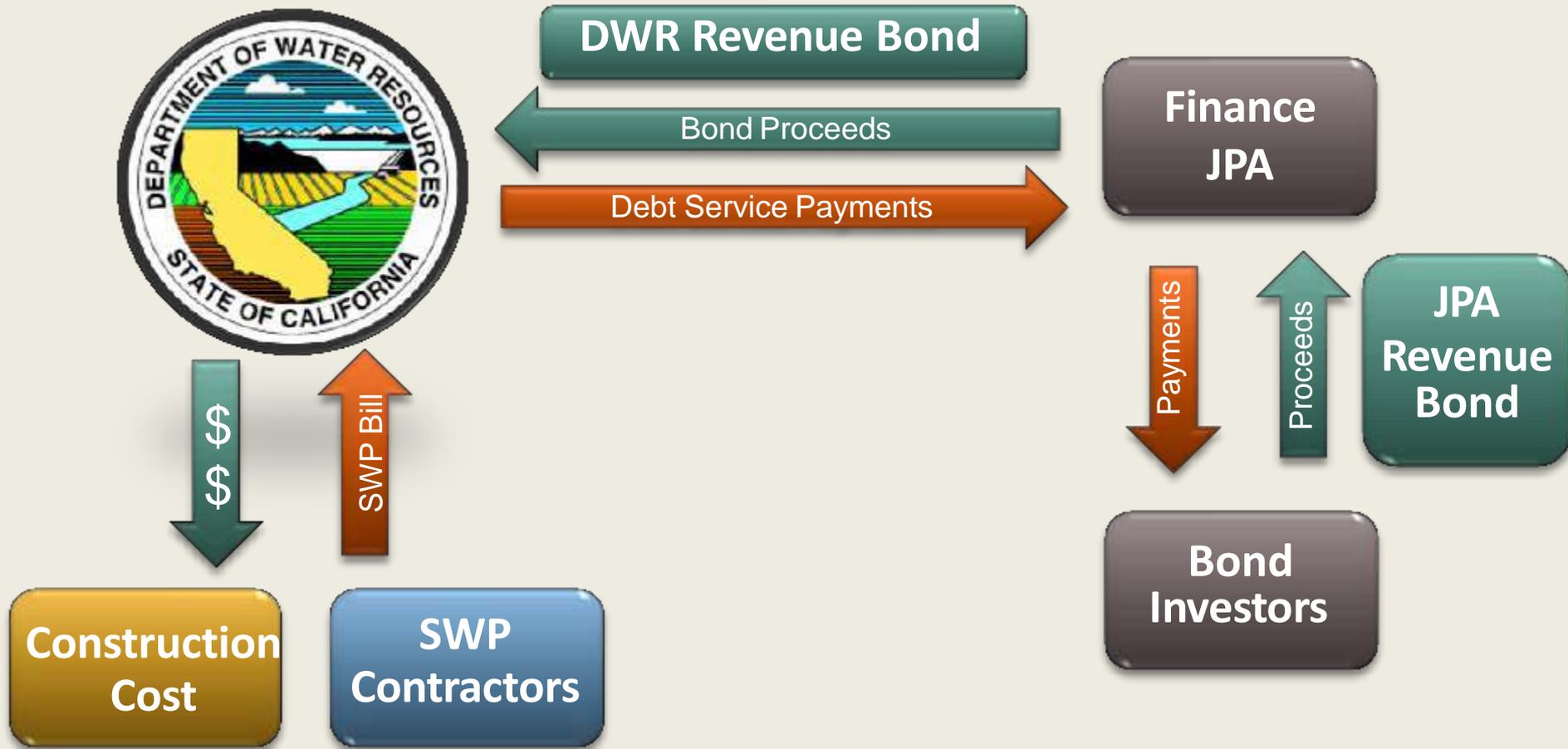
# Existing State Water Project Financing Approach



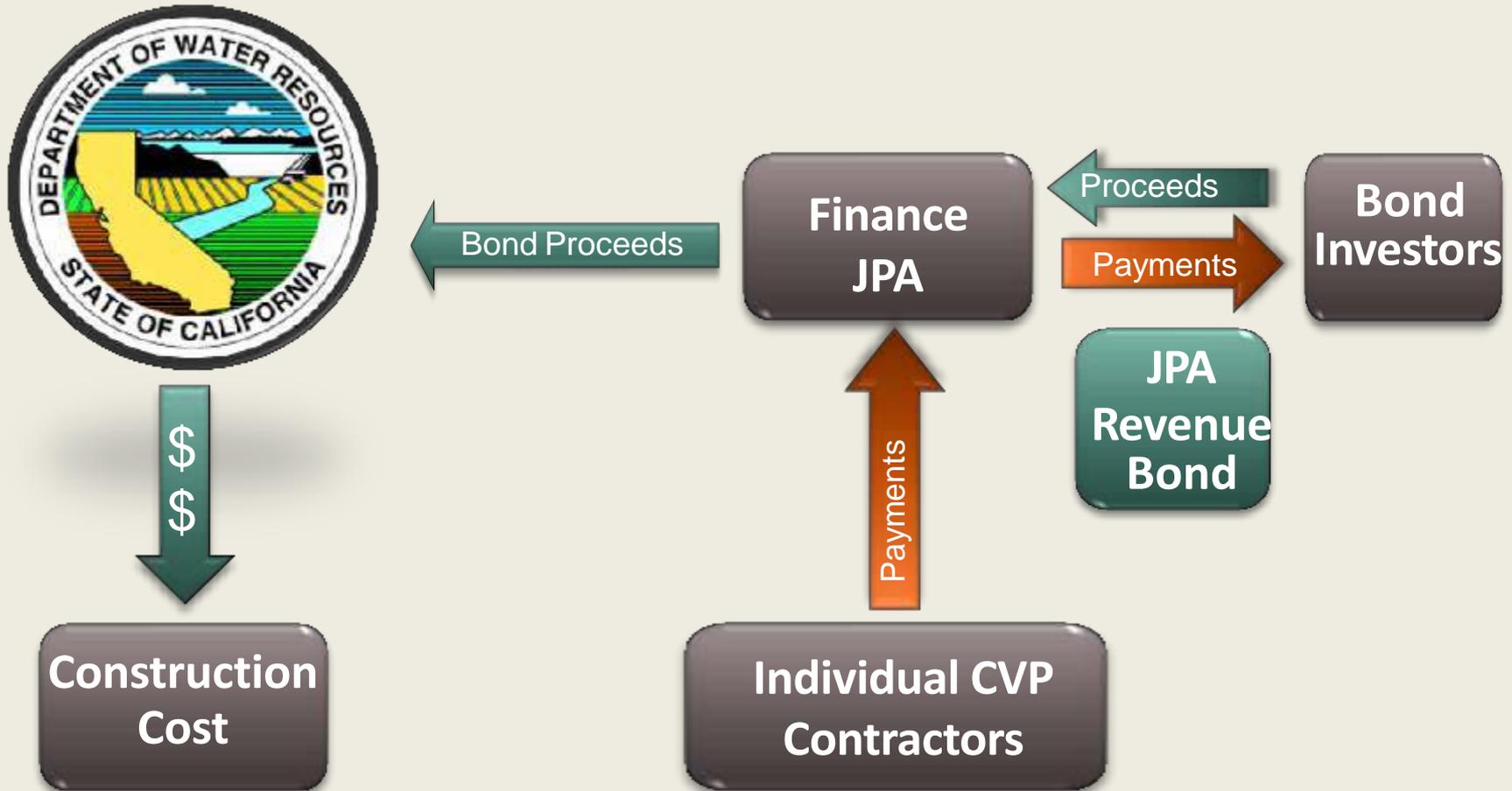
# The Department of Water Resources' validation action will impact the financing structure and timing of debt issuance

- ❖ Judicial proceeding to affirm authority to issue bonds
- ❖ DWR filed for validation determination with Sacramento County Superior Court regarding authority to issue revenue bonds for WaterFix
- ❖ Ability to issue bonds is affected until validation question is resolved

# State Water Project financing approach before resolution of validation action



# Central Valley Project financing approach



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## **Information in Response to Questions Raised During the August 22, 2017 Board Meeting**

- A. Permanent impacts of the WaterFix in the following areas:  
water quality, fisheries, water elevation, and visual
- B. Likelihood of a Delta levee failure event
- C. Pros and cons of upgrading all Delta levees
- D. Benefits of operational flexibility afforded by the WaterFix
- E. Pros and cons of smaller tunnel

## **A: Permanent impacts of the WaterFix in the following areas: water quality, fisheries, water elevation, and visual**

### ❖ Water quality:

- Water quality will be maintained at or below State Water Board water quality criteria.
- Small changes in salinity, both positive and negative, will be undetectable to recreational uses of the Delta
- No significant changes to aquatic vegetation expected.

### ❖ Fisheries impacts:

- Fish and wildlife agencies found both positive and negative impacts to fish species. Negative impacts will be mitigated or minimized per permit requirements.
- Operational flexibility, real-time operations, and adaptive management will ensure WaterFix, on balance, improves conditions for listed fish species over existing conditions

### ❖ Water elevation:

- No impacts to navigation from changes in elevation caused by construction or operation of WaterFix

### ❖ Visual impacts:

- Three permanent intake structures on the Sacramento River
- A permanent 40 acre intermediate forebay
- 2 permanent shafts 40 ft in diameter at each of three locations: Bouldin, Staten, and Bacon islands (6 shafts total)
- Enlarged Clifton Court Forebay with new pumping plant facilities adjacent
- New operable barrier with boat lock at the head of Old River
- Permanent overhead transmission lines to and around Clifton Court Forebay
- Permanent access roads on Bouldin and Bacon Islands and around Clifton Court Forebay
- Reusable tunnel material sites until materials are reused

Figure 1: Location of WaterFix facilities within the Delta and in relation to Santa Clara County

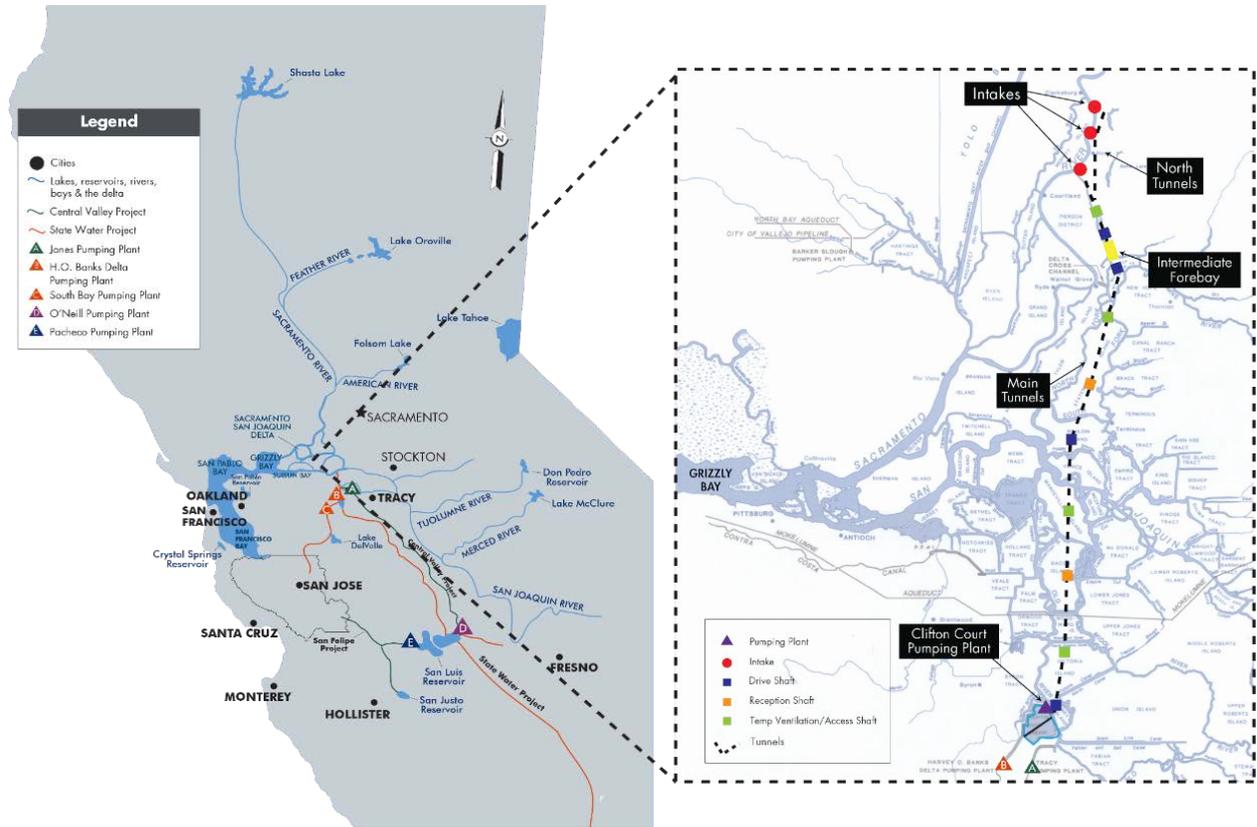


Figure 2: Sacramento River intake sites located near towns of Hood and Clarksburg

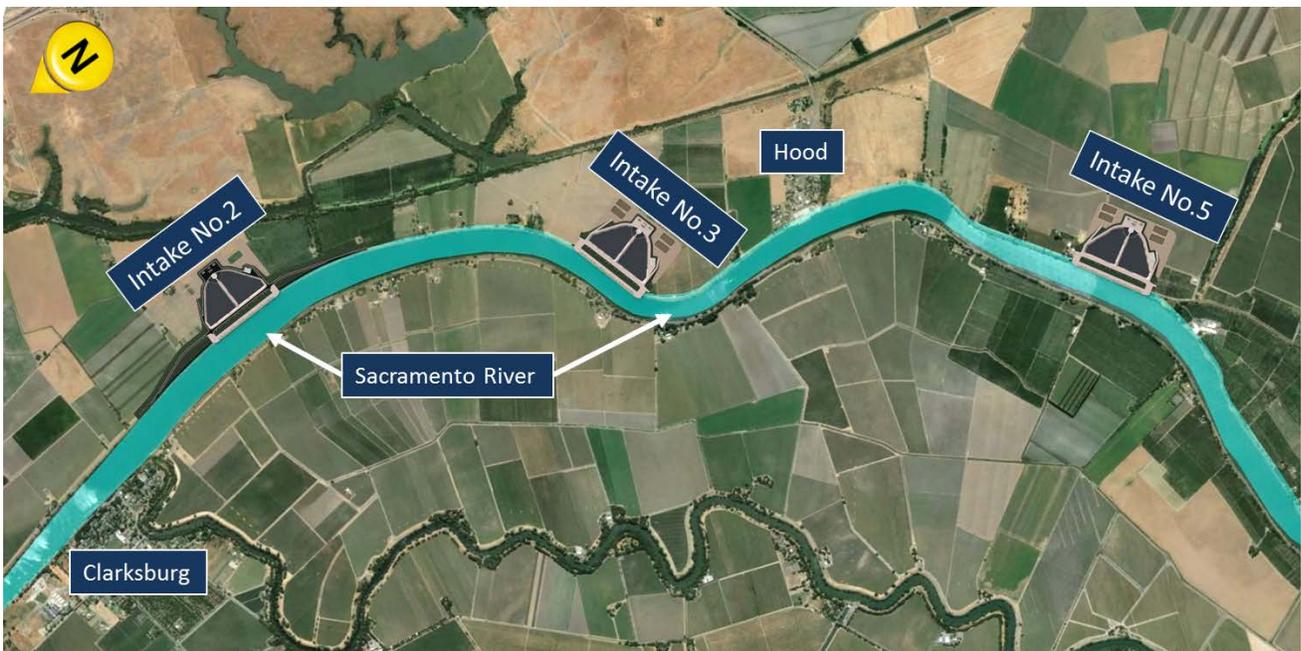


Figure 3: Sacramento River intake facilities



Figure 4: Intermediate Forebay facilities

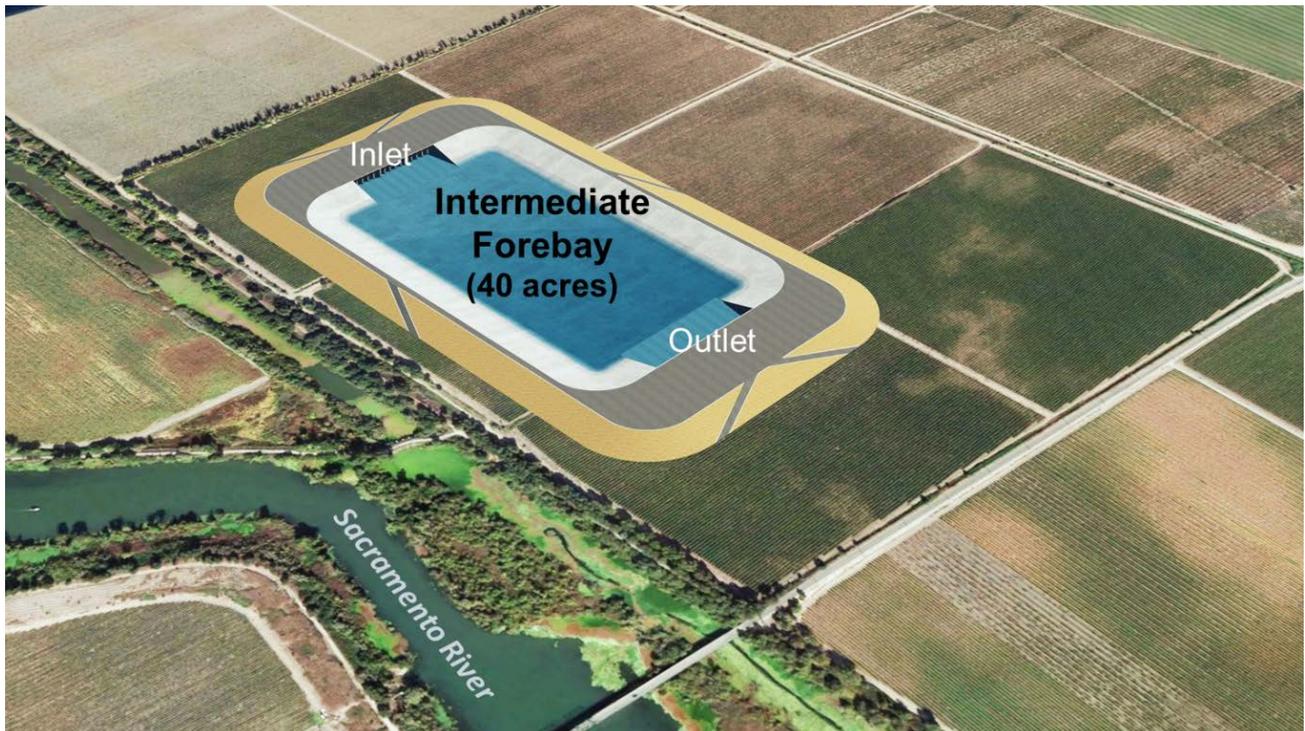
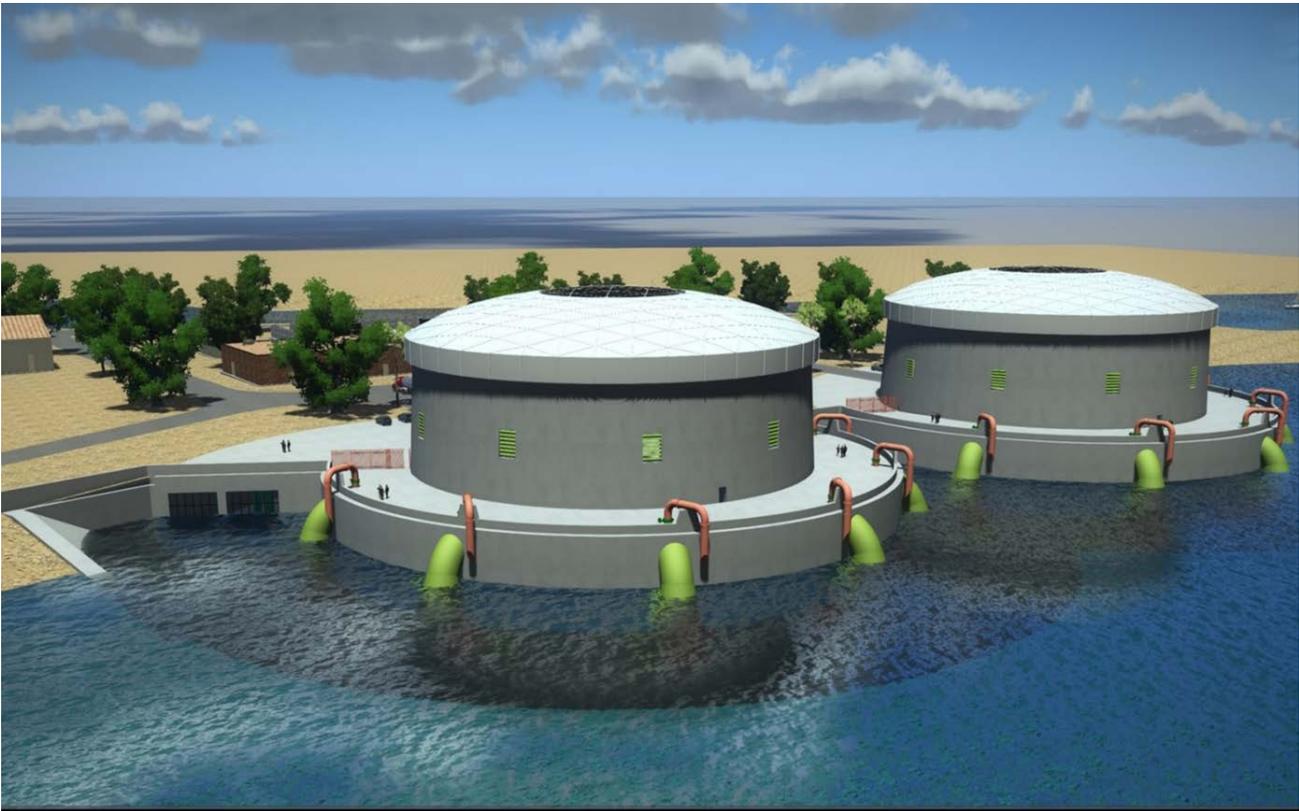


Figure 5: Clifton Court Forebay configuration



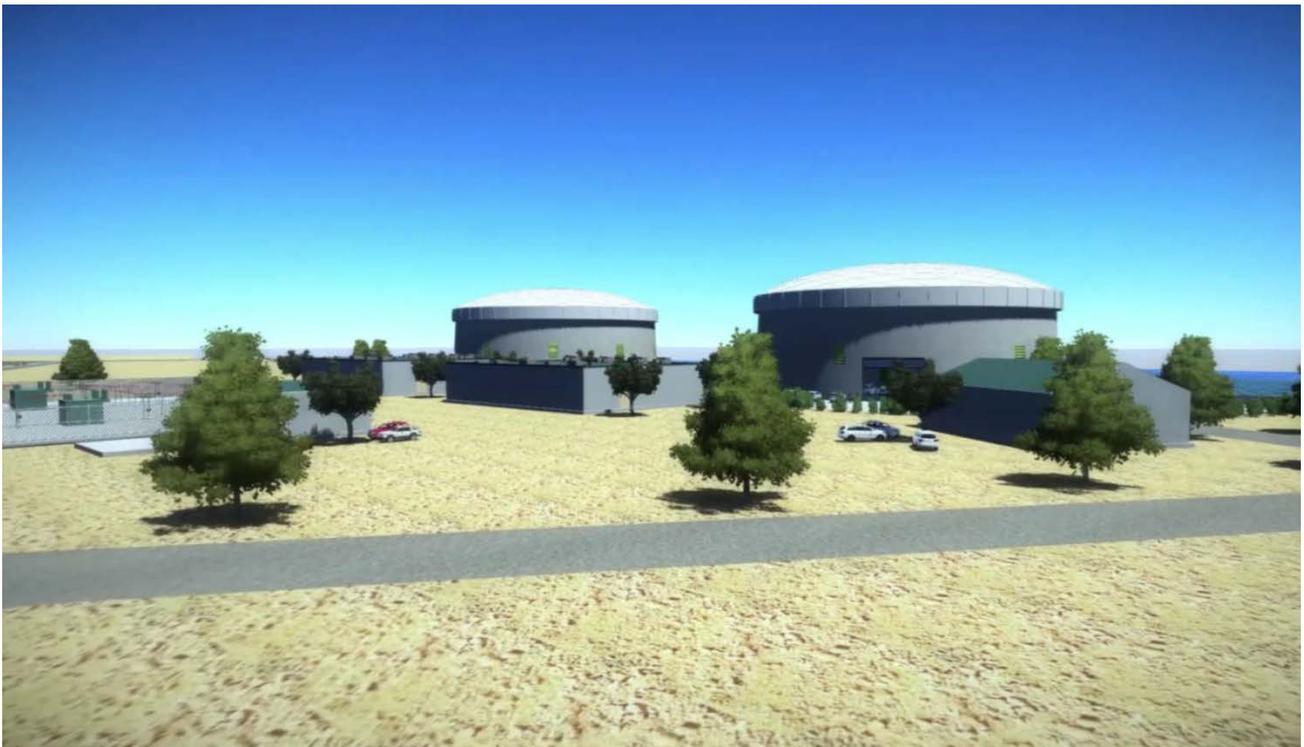
Figure 6: New pumping plant facilities at Clifton Court Forebay



*Figure 7: New pumping plant facilities at Clifton Court Forebay*



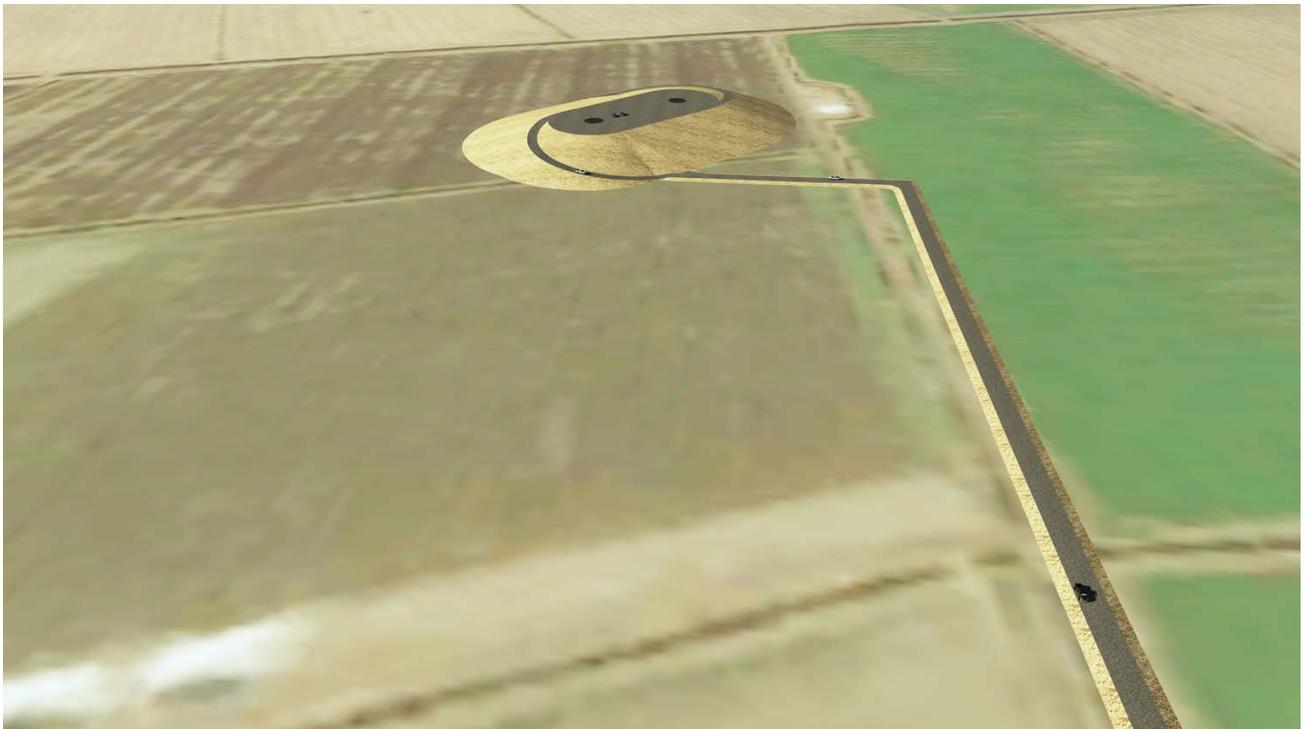
*Figure 8: New pumping plant facilities at Clifton Court Forebay*



*Figure 9: Access road and tunnel access pad on Bouldin Island*



*Figure 10: Tunnel access pad on Bouldin Island*



## **B: Likelihood of a Delta levee failure event**

- ❖ USGS scientist Dr. David Schwartz: In the next 100 years there will be strong shaking in the Delta from an East Bay earthquake that could lead to wide-scale levee failure.
- ❖ 2008 Delta Risk Management Study: 40 percent chance of a major earthquake causing levee failure and simultaneous flooding of 27 islands, leading to an interruption in exports
- ❖ UCLA researchers: Agree that liquefaction of sand below levees poses significant risk to levee stability and have found that peat soils amplify earthquake motions
- ❖ Public Policy Institute of California: "The combined effects of continued land subsidence, sea level rise, increasing seismic risk, and worsening winter floods make continued reliance on weak Delta levees imprudent and unworkable over the long term."

## **C: Pros and cons of upgrading all Delta levees**

### PROS:

- ❖ Increases resistance of Delta levees to failure from earthquakes and floods
- ❖ Protects Delta residences and businesses
- ❖ Some levee upgrades are needed anyway for multiple reasons

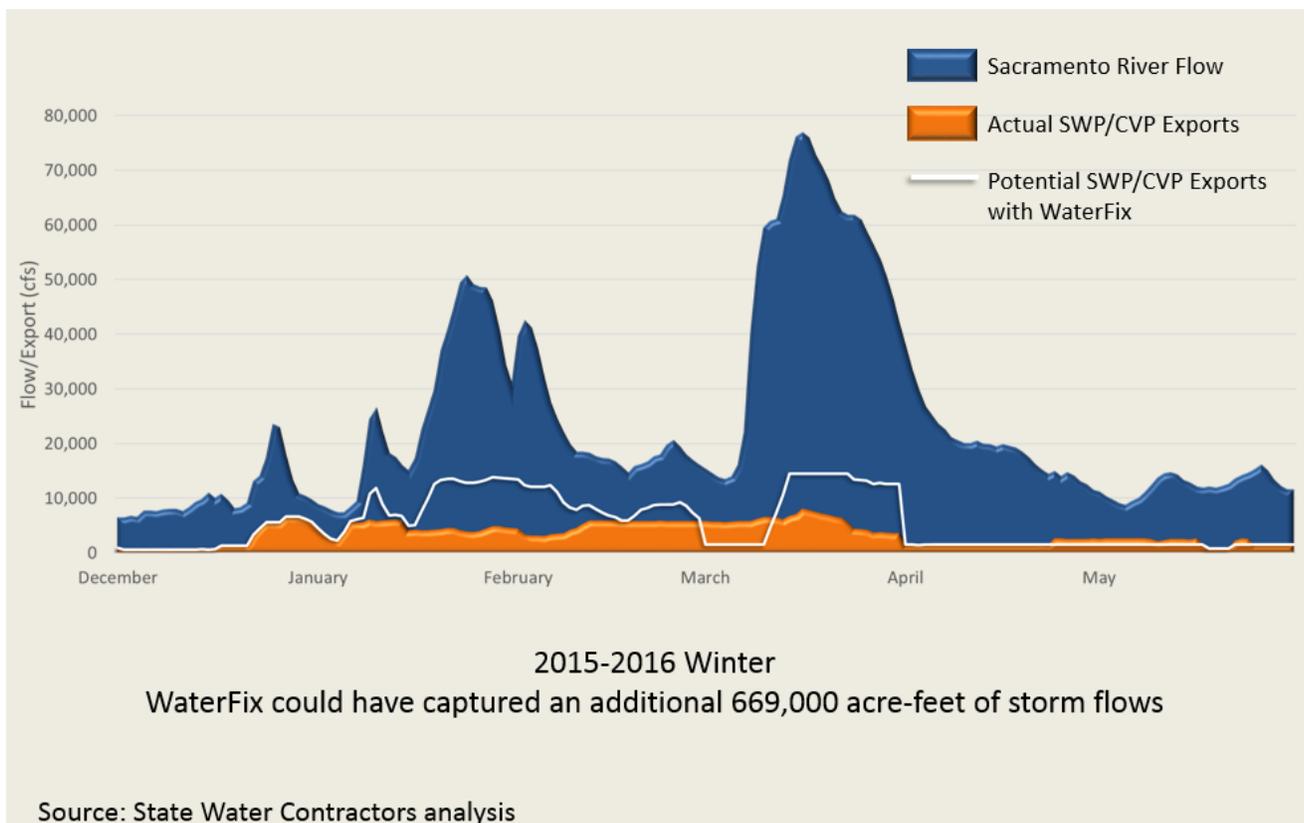
### CONS:

- ❖ Would not provide an environmental benefit and could impede restoration efforts in the Delta
- ❖ Does not protect against salinity intrusion from sea level rise
- ❖ Cost of levee repair in many cases exceeds value of land
- ❖ Ongoing maintenance required

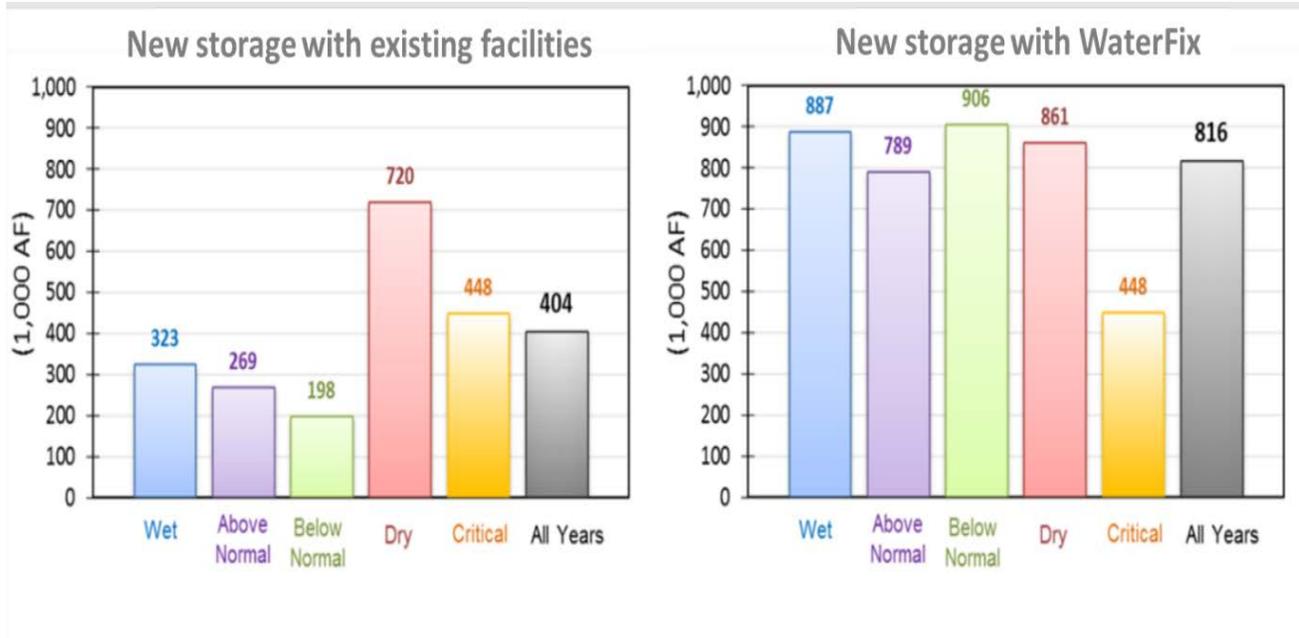
## D: Benefits of operational flexibility afforded by the WaterFix

- ❖ Improves ability to respond to real-time environmental conditions
- ❖ Significantly improves ability to transfer water
- ❖ Provides for storm flow capture
- ❖ Improves benefits of storage projects if integrated into SWP/CVP operations

**Figure 11:** Flexible operations with the WaterFix allows for increased diversions during storms, with less diversions during dry conditions



**Figure 12:** Average annual changes in SWP/CVP deliveries with new storage and existing facilities (left) and with new storage and WaterFix (right) by water year type. Source: Association of California Water Agencies, 2017.



**E: Pros and cons of smaller tunnel**

**PROS:**

- ❖ Reduced cost
- ❖ Less opposition

**CONS:**

- ❖ Less improvement in south Delta flow patterns
- ❖ Reduction in tunnel size does not result in a proportional reduction in cost. Available studies indicate that the cost for a 3,000 cfs tunnel is 60-75% of the cost for a 9,000 cfs tunnel.
- ❖ More vulnerability to salt water intrusion from levee failures and sea level rise
- ❖ Less operational flexibility

## Board Meetings and Workshops Related to Bay Delta Conservation Plan and California WaterFix

DATE	EVENT	TOPICS	GUESTS
August 25, 2017	Special Board meeting	Delta Counties Coalition presentation on alternatives to CA WaterFix	Don Nottoli (Supervisor, Sacramento Cnty) Chuck Winn (Supervisor, San Joaquin Cnty) Katherine Miller (Supervisor, San Joaquin Cnty) Diane Burgis (Supervisor, Contra Costa Cnty) Dr. Jeffrey Michael (Univ. of the Pacific)
August 22, 2017	Board Agenda item	Staff described the multi-agency proposed framework for design and construction management and governance for the WaterFix as well as proposed operations and adaptive management of the project	
August 22, 2017	Board Agenda item	Staff presentation on the status of the Delta ecosystem and factors impacting the District's imported water supplies as well as potential consequences of maintaining the status quo	
July 11, 2017	Board Agenda Item	Update on key elements of California WaterFix planning and development and the criteria by which staff is evaluating each consistent with District Board Policy and WaterFix Principles	
May 25, 2017	Board Workshop	A workshop to answer specific questions related to project cost estimation, risk assessment and management, and cost control - with reference to other large tunneling projects constructed in the US and elsewhere.	Chuck Gardener (BDCP Prg Manager) Bob Goodfellow (Aldea Services LLC) John Bednarski (Metropolitan Water District) Pat Pettiette (5RMK Int.)
March 14, 2017	Board Agenda Item	Board discussion of proposed principles to guide the District's participation in discussions, negotiations, and messaging regarding the California WaterFix (CWF)	
November 8, 2016	Board Agenda Item	BDCP AdHoc Committee disbanded	
July 12, 2016	Board Agenda Item	Staff provided an updated business case analysis and a draft District policy statement for the State Water Board hearing on the petition to change the point of diversion for the SWP and CVP	
April 15, 2016	Board Agenda Item	Staff provided an overview of imported water and current issues	
January 26, 2016 (3hr)	Board Workshop	A panel of guests provided updated information and resource agency perspectives on the California WaterFix and California EcoRestore.	Mark Cowin (CA Dept of Water Resources) David Okita (CA EcoRestore) Chuck Bonham (CA Dept of Fish & Wildlife)
October 27, 2015 (3hr)	Board Agenda Item	Staff provided an update on the BDCP and the re-circulated draft environmental documents including draft staff comments on the re-circulated documents.	
May 26, 2015	Board Agenda Item	Staff provided an update on the BDCP and described the new approach proposed by the State to separately develop California WaterFix and EcoRestore.	

## Board Meetings and Workshops Related to Bay Delta Conservation Plan and California WaterFix

DATE	EVENT	TOPICS	GUESTS
<b>January 22, 2015 (3hr)</b>	Board Workshop	Staff and a panel of invited guests described the BDCP adaptive management strategy and the current scientific understanding of habitat restoration in general as well as with respect to BDCP restoration actions.	Mike Chotkowski (US Fish & Wildlife Service) Jon Burau (US Geological Survey) Chris Earle (BDCP consultant, ecologist)
<b>September 23, 2014</b>	Board Agenda Item	Staff responded to questions and concerns raised by Board Members and the League of Women Voters of California with various aspects of the BDCP.	
<b>July 22, 2014</b>	Board Agenda Item	Staff presented draft District comments on the Public Review Draft BDCP and its EIR/EIS and on the draft BDCP Implementing Agreement for Board review for consistency with Board Policy. Staff also presented an update on the BDCP and responses to additional Board questions.	
<b>May 27, 2014</b>	Board Agenda Item	Following the five 2013–2014 District Board Workshops on BDCP, staff provided an update on Bay Delta Conservation Plan, a summary of the workshops, and responses to Board questions raised during and after the workshops.	
<b>January 27, 2014 (4hr)</b>	Board Workshop	Former Director of the San Francisco Public Utilities Commission's Water System Improvement Program, Julie Labonte, and President and CEO of Hallmark Group Capital Program Management, Chuck Gardner, described implementation of large water supply infrastructure construction projects.	Julie LaBonte (San Francisco PUC) Chuck Gardner (BDCP Prg Manager)
<b>December 9, 2013 (4hr)</b>	Board Workshop	Secretary of California Natural Resources Agency, John Laird and other invited guests provided perspectives on the importance of BDCP to the State, County and economy of Silicon Valley. Staff provided a preliminary analysis of BDCP benefits and costs to Santa Clara County.	John Laird (CA Natural Resources Agency) Casey Beyer (Silicon Valley Leadership Grp) Mark Ebbin (BDCP legal consultant)
<b>November 14, 2013 (3hr)</b>	Board Workshop	Director of Department of Fish and Wildlife Chuck Bonham, technical experts in Delta risks, and BDCP project managers discussed Delta risks, the relevance of BDCP to Delta fisheries, and plan components and analysis.	Chuck Bonham (CA Dept of Fish & Wildlife) Curt Schmutte (Consulting Engineer) Martin McCann (Jack R. Benjamin & Assoc.) Jennifer Pierre (BDCP Consultant) David Zippin (BDCP Consultant)
<b>November 8, 2013 (2.5 hr)</b>	Board Workshop	California Department of Fish and Wildlife staff and several representatives of environmental and in-Delta interests discussed habitat restoration and conservation in the Delta and the perspectives of in-Delta users.	Carl Wilcox (CA Dept of Fish & Wildlife) Leo Winternitz (The Nature Conservancy) John Cain (American Rivers) Russell van Loben Sels (Delta Farmer)
<b>October 11, 2013 (2hr)</b>	Board Workshop	Director of California Department of Water Resources, Mark Cowin, Undersecretary of California Department of Food and Agriculture, Sandra Schubert, and Economist David Sunding provided an overview of BDCP in relation to other State planning efforts and discussed the statewide economic impacts and perspective on BDCP.	Mark Cowin (Dept of Water Resources) Sandra Schubert (CA Dept of Food and Ag) David Sunding (UC Berkeley)

## Board Meetings and Workshops Related to Bay Delta Conservation Plan and California WaterFix

DATE	EVENT	TOPICS	GUESTS
<b>February 26, 2013</b>	Board Agenda Item	Prior to the release of the second Administrative Draft of the BDCP, staff provided an update on the BDCP and established a Board Ad Hoc Committee to assist the Board with developing policies relating to the District's engagement in the BDCP.	
<b>August 7, 2012</b>	Board Agenda Item	Following the July 25 <sup>th</sup> announcement by the Governor and Obama Administration on key elements of the BDCP proposed project, staff provided an update on the Bay Delta Conservation Plan and results of an opinion survey.	
<b>May 15,</b>	Board Agenda Item	Staff prepared a BDCP update following release of the preliminary administrative draft of the BDCP.	
<b>March 28, 2012 (3hr)</b>	Board Workshop	Several elected officials and residents of Delta counties discussed the in-Delta perspective on BDCP, along with perspectives from Senior Policy Fellow at the Public Policy Institute of California, Ellen Hanak.	Ellen Hanak (Public Policy Institute of CA) Mary Nejedly Piepho (Supervisor, Contra Costa Cnty) Russell van Loben Sels (Delta Farmer) Don Nottoli (Supervisor, Sacramento County) Michael Hardesty (Reclamation District 2068)
<b>October 14, 2011 (4hr)</b>	Board Workshop	Deputy Secretary of the California Natural Resources Agency, Gerald Meral, and several general managers of California water agencies discussed the water supply reliability goal of the BDCP.	Jerry Meral (CA Natural Resources Agency) Jill Duerig (Zone 7 Water Agency) Jeff Kightlinger (Metropolitan Water District) Jason Peltier (Westlands Water District) Curt Schmutte (Consulting Engineer)
<b>August 26, 2011 (3hr)</b>	Board Workshop	Secretary of California Natural Resources Agency, John Laird, and several representatives of environmental groups discussed the ecosystem restoration goal of the BDCP.	John Laird (CA Natural Resources Agency) Campbell Ingram (Delta Conservancy) Sprek Rosenkrans (Environmental Defense Fund) Richard Roos Collins (Water & Power Law Grp)
<b>May 10, 2011</b>	Board Agenda Item	Overview of Delta Issues	

## Bay Delta Conservation Plan Ad Hoc Committee Meetings

<b>Date</b>	<b>Event</b>	<b>Topics</b>	<b>Guests</b>
<b>October 25, 2016</b>	Ad Hoc Mtg	Status of the California WaterFix, EcoRestore, and other Delta planning efforts as well as Board member participation in California WaterFix negotiations	
<b>June 21, 2016</b>	Ad Hoc Mtg	Update on California WaterFix and the status of the Design Construction Enterprise and related agreements	
<b>February 22, 2016</b>	Ad Hoc Mtg	Nomination and appointment of new Vice Chair as well as the California WaterFix business case, status of the Design Construction Enterprise and related agreements, and draft policy statement for the State Water Board proceedings	
<b>November 24, 2015</b>	Ad Hoc Mtg	Update on the California WaterFix business case	
<b>October 13, 2015</b>	Ad Hoc Mtg	Update on the Bay Delta Conservation Plan and preliminary staff review of the recirculated draft environmental documents, a draft outline for a cost benefit analysis for Santa Clara County, staff response to questions raised by Board Members between 10/22/14 - 5/26/15, and a proposed schedule for future Board communications	
<b>May 13, 2015</b>	Ad Hoc Mtg	Update and discussion on the Bay Delta Conservation Plan	
<b>April 1, 2015</b>	Ad Hoc Mtg	CANCELLED	
<b>September 9, 2014</b>	Ad Hoc Mtg	Staff responses to Board member questions on the Bay Delta Conservation Plan, draft staff responses to the comment letter from the League of Women Voters of CA, and a proposed schedule for the Board communication on Bay Delta Conservation Plan	
<b>July 10, 2014</b>	Ad Hoc Mtg	Draft District comments on the Public Draft Bay Delta Conservation Plan and draft environmental review documents, and on the Implementing Agreement, and staff responses to additional board questions	
<b>June 3, 2014</b>	Ad Hoc Mtg	Draft District comments on the Public Draft Bay Delta Conservation Plan, draft environmental review documents and draft Implementing Agreement, as well as the Design Construction Enterprise, and Interim Funding Agreements	
<b>January 24, 2014</b>	Ad Hoc Mtg	Bay-Delta problem statement for Santa Clara County, Board governance policies related to Bay Delta Conservation Plan, and staff comparison of Bay Delta Conservation Plan to Natural Resource Defense Council et.al. proposal and no project	
<b>January 13, 2014</b>	Ad Hoc Mtg	Draft Bay-Delta problem statement for Santa Clara County, Board governance policies related to Bay Delta Conservation Plan, a staff comparison of the Bay Delta Conservation Plan to a Natural Resource Defense Council et. al. proposal and no project, and a list of Board Member issues raised at recent Bay Delta Conservation Plan workshops	

## Bay Delta Conservation Plan Ad Hoc Committee Meetings

<b>Date</b>	<b>Event</b>	<b>Topics</b>	<b>Guests</b>
<b>December 17, 2013</b>	Ad Hoc Mtg	2013 Board Workshops on the Bay Delta Conservation Plan, potential 2014 Board items, and next steps for public outreach and engagement	
<b>October 9, 2013</b>	Ad Hoc Mtg	Update on Bay Delta Conservation Plan including Conservation Measure 1 Optimization, a statewide Economic Impact Report, and an Independent Panel Review of the Bay Delta Conservation Plan	
<b>August 22, 2013</b>	Ad Hoc Mtg	Presentations by Restore the Delta and Sierra Club as well as the role of science in Delta planning and the schedule for Bay Delta issues and Board Communications	Michael Frost (Restore the Delta) Katja Irvin (Sierra Club)
<b>June 25, 2013</b>	Ad Hoc Mtg	Presenation by the Natural Resources Defense Council as well as an overview of Chapters 8-10 and Board member communication and outreach	Doug Obegi (NRDC)
<b>May 28, 2013</b>	Ad Hoc Mtg	Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement Alternatives, the construction management structure for Conservation Measure 1, the Delta Dialogues – Discussion Group, and BDCP and Board Workshops schedule	
<b>April 22, 2013</b>	Ad Hoc Mtg	Overview of Bay Delta Conservation Plan Chapters 1-4 (Continued from 4/9/13), and Chapters 5-7 as well as the Natural Resource Defense Council's proposed portfolio-based alternative (Continued from 4/9/13)	
<b>April 9, 2013</b>	Ad Hoc Mtg	Scope and Purpose of the Ad Hoc Committee, the Delta Stewardship Council's Delta Plan, Bay Delta Conservation Plan, Chapters 1-4, and the Natural Resource Defense Council's proposed portfolio-based Alternative	
<b>March 18, 2013</b>	Ad Hoc Mtg	Bay Delta Conservation Plan Ad Hoc Committee's Purpose and Intended Outcome	

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## **Attachment 5: WaterFix Financial Risks**

The purpose for this attachment is to describe the potential financial risks associated with the California WaterFix Project (Project) and the impact to the District of the Department of Water Resources (DWR) validation action filed on July 21, 2017, with the Sacramento County Superior Court.

### **Background**

As stated in the Board memorandum, DWR has begun the legal procedures to obtain judicial validation on its authority to issue revenue bonds, among other things, for the Project. This legal process may take several years to resolve depending on many factors, including but not limited to the scope and extent of any responses or appeals filed by parties who may be opposed to the Project. In order to proceed with the Project prior to the conclusion of the validation action, DWR, in conjunction with State Water Project (SWP) and Central Valley Project (CVP) contractors are proposing an alternative financing framework so that bonds may be issued through a Finance Joint Powers Authority (Finance JPA) to fund the construction costs of the Project. Depending on whether DWR receives validation of its authority related to the Project, the following potential financial risks associated with the Project are presented for Board consideration.

### **District's Participation on the Finance JPA**

The District will have the opportunity to join the Finance JPA as a SWP and CVP contractor, or as a CVP contractor only. To participate in the WaterFix on the SWP side, the District is not required to participate on the Finance JPA as a SWP contractor, as the District would be participating through paying its share of the SWP costs through the State Water Supply Contract. The District, however, may choose to join the Finance JPA as a SWP contractor. In doing so, the District would take on the risk of having to back a portion of the SWP share of the bonds issued by the Finance JPA should DWR not be able to proceed with the WaterFix. The District would in return be in a position of owning a certain interest in the state portion of the WaterFix should the facilities be transferred to the Finance JPA. If the District does not join the Finance JPA as a SWP contractor, and DWR's authority is invalidated and the Project is transferred to the Finance JPA, the District will not have an ownership interest in the state portion of the WaterFix project, despite paying its share of the SWP project costs through the State Water Supply Contract.

To participate in the WaterFix on the CVP side, the District must join the Finance JPA as a CVP contractor. This is because the Finance JPA will be the vehicle for providing the CVP share of the WaterFix's costs to DWR.

### **DWR Authority Validated**

Should DWR successfully receive judicial validation of its authority related to the Project, DWR would issue long-term revenue bonds to the public capital markets to refund outstanding Finance JPA bonds initially issued on behalf of the SWP contractors. The CVP contractors would continue to pay for a proportion of the costs in accordance with the capacity interest each CVP contractor receives. If the validation event occurs prior to the construction completion of

## **Attachment 5: WaterFix Financial Risks**

the Project, then DWR would assume financing the balance of the Project costs going forward, and the Finance JPA would be terminated after DWR has refunded all outstanding debt obligations of the Finance JPA. There would be no additional financial risks under this scenario, apart from the normal range of Capital Project Financing Risks that are typical to financing capital projects of this size and nature, such risks may include but are not limited to the following: e.g. schedule delays, cost over-runs, interest rate risks, market access risks, construction risks, environmental risks, stranded asset risks, force majeure risks.

### **DWR Authority Invalidated**

Should DWR's authority to issue revenue bonds to fund the WaterFix be invalidated a potential approach that may be taken is to continue to participate in the Finance JPA with the expectation of eventually resolving any legal challenges either through legislative remedies or contractual arrangements, to construct and operate the Project. The terms of such arrangements will be prescribed in the Finance JPA and related agreements, and will be intended to allow the remaining parties to move forward with the Project. The District's financial risks may vary depending on the District's level of participation. An example of the financial exposure the District may face with this alternative path is that a portion of the costs up to the full construction costs of the Project may have been expended, but the Project is not operable or is significantly delayed due to protracted legal proceedings, in addition to the typical Capital Project Financing risks discussed above. Assuming the Higher CVP scenario with an estimated total District debt obligation of approximately \$747 million (including costs of issuance) issued over multiple bond series over time with 30 years maturity, the District's annual debt service payments could range from \$2 million to \$52.5 million until the outstanding bonds are fully repaid in 2060 for a total debt service payment of up to \$1.46 billion.