Agreements for the management of water quality south of Mission Trails Flow Regulatory Structure

Engineering & Operations Committee Meeting
August 24, 2017
Previous Related Board Presentations

- May 25, 2017 - Treated Water Optimization
- July 26, 2017 – Water Treatment Plant Operations
Water Authority is experiencing nitrification throughout the aqueduct system, with the highest levels occurring at the terminus of the Second Aqueduct.

Increased nitrification is being caused by recent source water change from Colorado River Water to State Project Waters and decreased system demands.
Levels of Nitrification

Low
Moderate
High
Mitigation Options

- Switch to alternative supplies
- Chlorine boosting
- Chlorine “burn”
- Flushing
- Increase demand
- Reduce pipeline volumes
Recommendation

- Authorize the General Manager to negotiate and execute agreements as needed with up to five member agencies to address water quality challenges south of the Mission Trails Flow Regulatory Structure.
Approve the Water Shortage Contingency Plan

Water Planning Committee
August 24, 2017
Background: Water Authority Board

Shortage Response Planning Actions

- 2006 Drought Management Plan
- 2008 Procedures to administer allocation methodology
- 2008 Model Drought Response Ordinance
- 2012 M&I supply allocation methodology updated
- 2016 Carryover Storage Policy Guidelines
Why Update the Plan?

- Update original sections from 2006 Plan (e.g., communication strategy)
- Incorporate policies and procedures approved since 2006
- Revise current stages into regional shortage response levels
- Modify to be consistent with state April 2017 Framework Report
- Ensure continued proactive planning for future water supply shortages
<table>
<thead>
<tr>
<th>Date (2017)</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>Informational report to <strong>Water Planning Committee</strong> and <strong>member agency managers</strong> on WSCP update</td>
</tr>
<tr>
<td>March</td>
<td><strong>Member agency</strong> workshop to review proposed WSCP sections</td>
</tr>
<tr>
<td>April</td>
<td><strong>Water Planning Committee</strong> workshop on WSCP background and proposed sections</td>
</tr>
<tr>
<td>June</td>
<td>Draft WSCP distributed to <strong>member agency managers</strong> for comments</td>
</tr>
<tr>
<td>July</td>
<td>Report to <strong>member agency managers</strong> on comments received on draft WSCP</td>
</tr>
<tr>
<td>August</td>
<td>Final Draft WSCP distributed to <strong>Board members</strong> and <strong>member agency managers</strong></td>
</tr>
</tbody>
</table>
Comments Received from Member Agencies

- 72 comments
- Comments very helpful in preparing a more clear and concise document
- Majority focused on annual M&I reliability analysis (Section 4) and drought response levels and actions (Section 5)
- Comments included suggested topics for future policy discussions outside WSCP process
## Draft WSCP Sections

<table>
<thead>
<tr>
<th>Section</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction, purpose, and need for the plan</td>
</tr>
<tr>
<td>2</td>
<td>Plan preparation and re-evaluation</td>
</tr>
<tr>
<td>3</td>
<td>Historic drought response and management actions</td>
</tr>
<tr>
<td>4</td>
<td>Annual municipal and industrial reliability analysis</td>
</tr>
<tr>
<td>5</td>
<td>Regional shortage response actions and levels</td>
</tr>
<tr>
<td>6</td>
<td>Extraordinary demand reduction measures</td>
</tr>
<tr>
<td>7</td>
<td>Municipal and industrial supply allocation methodology</td>
</tr>
<tr>
<td>8</td>
<td>Catastrophic water shortages</td>
</tr>
<tr>
<td>9</td>
<td>Communication plan</td>
</tr>
<tr>
<td>10</td>
<td>Implementation</td>
</tr>
</tbody>
</table>
Key Revisions of Draft Updated Plan

- New and improved sections
  - Includes evaluation criteria and process to conduct annual reliability assessment
  - Contains regional shortage response levels, instead of drought stages
  - More flexible and adaptive communication plan

- More comprehensive document
  - Incorporates previously approved Board related actions (e.g. carryover storage guidelines)

- Ensures Water Authority continues to proactively plan for future shortages
Board approval will not require member agencies to update planning documents or ordinances at this time

Review and update 2008 Model Drought Response Ordinance in 2018 or 2019
  - Process to begin after SWRCB has adopted permanent waste prohibitions
  - Member agency collaborative process
  - Potential minor modifications to WSCP

Full review and update of WSCP as part of 2020 Urban Water Management Plan update
  - Ensure plan consistent with legal requirements
Staff Recommendation

Approve the Water Shortage Contingency Plan
2017 Water Desalination Grant Program Application

Water Planning Committee
August 24, 2017

Goldy Herbon
Senior Water Resources Specialist
Water Desalination Grant Program Overview

- Provides grants to local agencies for brackish and seawater desalination projects
- Proposition 1 passed by CA voters in 2014
  - $100M funding available for desalination projects

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Cap per Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>$10,000,000</td>
</tr>
<tr>
<td>Feasibility Studies</td>
<td>$700,000</td>
</tr>
<tr>
<td>Environmental Documentation</td>
<td>$500,000</td>
</tr>
<tr>
<td>Design Pilot</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Research Pilot</td>
<td>$1,000,000</td>
</tr>
</tbody>
</table>
Current Prop 1 Funding Opportunity

- Solicitation released on June 16, 2017 by DWR
- Apply for $10M grant for Lewis Carlsbad Desalination Plant Intake Modifications Project
  - Project permitting by Poseidon underway
  - Previous Board Action to certify SEIR in August 2016
- Proposals due September 1, 2017
  - Requires Board resolution to apply for and administer funding
  - Grant funds will solely benefit the Water Authority through a reduced water purchase price
Staff Recommendation

a) The General Manager is authorized to sign and file for, on behalf of the Water Authority, an application for funding from the California Department of Water Resources’ Water Desalination Grant Program (Proposition 1 Round 4) in an amount not to exceed $10,000,000 for the Lewis Carlsbad Desalination Plant Intake Modifications.

b) The Water Authority will comply with all applicable state and federal statutory and regulatory requirements related to any federal and state funds received.

c) The General Manager or designee is authorized to negotiate and execute a funding agreement and any amendments thereof, and certify funding disbursements on behalf of the Water Authority.
Claude “Bud” Lewis Carlsbad Desalination Plant Operations for Fiscal Year 2017

Water Planning Committee
August 24, 2017
Agenda

- FY2017 Plant Operation and Performance
  - Water Delivery
  - Water Quality
  - Regulatory Compliance
  - Costs

- Poseidon Presentation

- Questions
Lewis Carlsbad Desalination Plant

- Public-Private Partnership (P3)
  - Risk Transfer to private sector
  - Commercial operation began on December 23, 2015
  - Produced over 65,000 acre-feet of water

- Water Purchase Agreement (WPA) between Water Authority and Poseidon
  - Commercial and financial terms for production and delivery of water
  - Water Authority agreed to purchase entire output from plant, with a minimum commitment of 48,000 AF/year
  - Poseidon committed to supply up to 56,000 AF/year
  - Just completed first full contract year (July 1, 2016-June 30, 2017)
Contract Year 2016/2017 Performance Water Delivery

Water Authority Order Requirements:
- Monthly Minimum Demand Commitments
- Annual Minimum Demand Commitment

Poseidon Supply Requirements:
- Delivered Water (40,419 AF)
- Supply Shortfalls
  - Excused (1,605 AF)
  - Unexcused (5,961 AF)
- Unscheduled Outage (1,630 AF)
- Performance Challenges
  - Algal bloom in Agua Hedionda Lagoon
  - Source water temperature swings
Unexcused Supply Shortfalls

<table>
<thead>
<tr>
<th>Month</th>
<th>Acre-Feet</th>
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<tbody>
<tr>
<td>July</td>
<td>0</td>
</tr>
<tr>
<td>August</td>
<td>500</td>
</tr>
<tr>
<td>September</td>
<td>1,000</td>
</tr>
<tr>
<td>October</td>
<td>1,500</td>
</tr>
<tr>
<td>November</td>
<td>2,000</td>
</tr>
<tr>
<td>December</td>
<td>2,500</td>
</tr>
<tr>
<td>January</td>
<td>66</td>
</tr>
<tr>
<td>February</td>
<td>41</td>
</tr>
<tr>
<td>March</td>
<td>162</td>
</tr>
<tr>
<td>April</td>
<td>3,364</td>
</tr>
<tr>
<td>May</td>
<td>768</td>
</tr>
<tr>
<td>June</td>
<td>1,559</td>
</tr>
</tbody>
</table>
Contract year 2016/2017 Performance
Water Quality / Regulatory Compliance

- Water Quality
  - Met all state and federal drinking water requirements

- Regulatory Compliance
  - Three primary permits
    - NPDES (San Diego Water Board)
    - Wastewater Discharge Permit (Encina WW Authority)
    - Domestic Water Supply Permit (Division of Drinking Water)
  - Minor issues identified and corrected immediately
WPA Risk Transfer Performed as Advertised

Contract Year 2016/2017 Costs

- Projected 2016/2017 Unit Cost $2,368/AF
- Actual 2016/2017 Unit Cost $2,412/AF
  - Electricity rates increased five percent
- Projected 2017/2018 Unit Cost $2,439/AF

<table>
<thead>
<tr>
<th></th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Water Purchase Cost</td>
<td>$91.0 M</td>
</tr>
<tr>
<td>Conveyance Pipeline Cost</td>
<td>$10.1 M</td>
</tr>
<tr>
<td><strong>SubTotal</strong></td>
<td><strong>$101.1 M</strong></td>
</tr>
<tr>
<td>Poseidon Penalties (estimate)</td>
<td>($3.6 M)</td>
</tr>
<tr>
<td><strong>Total 2016/2017 Cost</strong></td>
<td><strong>$97.5 M</strong></td>
</tr>
</tbody>
</table>
Claude “Bud” Lewis
Carlsbad Desalination Plant Update
San Diego County Water Authority Board of Directors
August 24, 2017
Carlsbad Desalination Project Operations

- CDP delivered over 65,000 AF of high quality water since commercial operations
- 100% of deliveries complied with state and federal drinking water standards
- Delivered 95% of Water Authority requests in 2016
- New local supply insulated Water Authority from water use restrictions
- Delivered 70% of Water Authority requests in 2017
- Taking appropriate actions to address recent shortfalls
- Committed to delivering safe, reliable, and financially secure water supply
Challenging Source Water Conditions

- Record rainfall led to severe algae bloom
- First time CDP operated under such challenging conditions
- Particular care given to protecting integrity of reverse osmosis membranes
- Due to the algae bloom’s severity, managed operations conservatively
  - Reduced production initially
  - Suspended production until algae bloom subsided
- Working collaboratively with Water Authority and project partners to address these challenges
Intake Water Quality with Excessive Rain

Normal intake conditions

February 2017 - conditions after excessive rain inundated the watershed
Intake Water Quality with Algae Bloom

Normal intake conditions

April 2017 – intake conditions during extreme algae bloom
Corrective Actions

1. Intake Channel
   - Install real-time algae monitoring
   - Install chlorine injection system

2. Pretreatment
   - Install oxygen monitors
   - Install aeration system
   - Enhance coagulant and polymer feed capabilities
   - Revise operating protocols for challenging source water conditions

3. RO Building
   - Install new membranes
   - Clean existing membranes
Regulatory Operational Constraint

- Water temperature affects total dissolved solids (TDS) concentration in product water
- Division of Drinking Water (DDW) initially set TDS limit conservatively
  - Current method unable to distinguish between a membrane integrity breach and an otherwise harmless temperature increase
- Encina Power Plant operations can increase source water temperature
- If TDS limit exceeded, CDP required to suspend production, although water produced meets safe drinking water and contract standards
- Corrective actions:
  - Working with DDW to reset TDS limit to avoid constraining CDP operations
  - Issue resolved once Encina ceases operations (end 2018)
Recent Operations

• July:
  – Regulatory operational constraints
  – Membrane maintenance
  – Product water pump warranty repairs

• August:
  – Last week a mechanical coupling failed during startup of an RO train
  – Operations have been temporarily suspended to address repairs and to inspect and ensure continued safe and reliable operations
Financial Protections

- Water Purchase Agreement protects the Water Authority and its Member Agencies
  - Water Authority only pays for delivered water
  - CDP pays a proportional share of debt service on the Water Authority’s conveyance pipeline for water not delivered

- Recent operating challenges will not impact payments to CDP bondholders
  - CDP in full compliance with all obligations under bond financing agreements and has made debt service payments on schedule
  - As of July 31, CDP reserve accounts are fully funded at $111 million
Summary

- Delivered over 65,000 AF of high quality water since commercial operations
- 100% of deliveries complied with state and federal drinking water standards
- Continuing process of optimizing plant operations
- Project is financially sound and structured to protect Water Authority
- Poseidon will continue to be a good steward of this important asset over the life of the project

Committed to delivering safe, reliable, and financially secure water supply
Sacramento Report

Legislation and Public Outreach Committee
August 24, 2017

Glenn Farrel, Government Relations Manager
August 21: Legislature returned from Summer recess

September 1: Deadline for bills to be heard and considered in fiscal committees

September 15: Legislature adjourns 2017 legislative session
Water Authority Sponsored Bills

- **AB 1323 (Weber)**
  - Stakeholder workgroup process through DWR to develop long-term water use efficiency standards
  - Passed Senate Natural Resources and Water Committee on a 9–0 vote
  - Placed on Senate Appropriations Committee suspense file

- **SB 701 (Hueso)**
  - Water Authority partnered with other stakeholders on a state general obligation bond to address Salton Sea restoration
  - Passed Assembly Water, Parks, and Wildlife Committee on a 10–4 vote
  - Placed on Assembly Appropriations Committee suspense file
Major Remaining Issues on Legislature’s Agenda

- Affordable housing package
- Resources bond
- Cap-and-trade revenue spending
- Bail reform
- Telecommunication facility siting
- 100% zero-carbon emission energy resources
- “Making Conservation a California Way of Life”
- Water tax
Little Hoover Commission

- August 24 LHC business meeting
  - Review and consider approval of the Special Districts report
  - Report will include:
    - In-depth analysis of special districts
    - Recommendations for changes to the way special districts operate and are governed
Update on Long-Term Water Use Efficiency Legislation

Legislation and Public Outreach Committee
August 24, 2017

Glenn Farrel, Government Relations Manager
Dana Friehauf, Water Resources Manager
## Water Use Efficiency Legislation

<table>
<thead>
<tr>
<th>Bill</th>
<th>Synopsis</th>
<th>WA Position</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AB 1323 (Weber)</strong></td>
<td>DWR stakeholder working group</td>
<td>Sponsor</td>
<td>Senate Approps</td>
</tr>
<tr>
<td><strong>AB 1654 (Rubio)</strong></td>
<td>Intent language only</td>
<td>Co-Sponsor/Support</td>
<td>Senate Approps</td>
</tr>
<tr>
<td><strong>AB 1668 (Friedman)</strong></td>
<td>Intent language only</td>
<td>Oppose Unless Amended</td>
<td>Senate Approps</td>
</tr>
<tr>
<td><strong>SB 606 (Skinner/Hertzberg)</strong></td>
<td>Intent language only</td>
<td>No Position</td>
<td>Assembly Approps</td>
</tr>
<tr>
<td><strong>RN 17–09926</strong></td>
<td>Water shortage contingency plan</td>
<td>Oppose Unless Amended</td>
<td>On–hold</td>
</tr>
<tr>
<td><strong>RN 17–12268</strong></td>
<td>Long–term WUE targets</td>
<td>Oppose</td>
<td>On–hold</td>
</tr>
</tbody>
</table>
Water Use Efficiency Legislation

- Activities over summer recess
  - Legislative staff developed “Discussion Draft”
    - Circulated for feedback among extremely limited group of interests
  - Stakeholder meeting held on August 2
    - Lots of questions and concerns – no issues resolved

- Bills amended with new legislative language on August 21
  - SB 606 (Hertzberg/Skinner)
  - AB 1668 (Friedman)
<table>
<thead>
<tr>
<th>Priority</th>
<th>Addressed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycled Water Credit</td>
<td>Partially (mostly “no”)</td>
</tr>
<tr>
<td></td>
<td>• Potential variance for landscape areas irrigated with recycled water high in total dissolved solids</td>
</tr>
<tr>
<td></td>
<td>• Potable reuse credit in year 2021 at ten percent of supplier’s potable reuse production.</td>
</tr>
<tr>
<td></td>
<td>• Credit decreases one percent per year, until zero in 2031</td>
</tr>
<tr>
<td>Form workgroup to identify CII performance measures</td>
<td>Partially (mostly “no”)</td>
</tr>
<tr>
<td></td>
<td>• Stakeholder input on recommended thresholds for performance measures</td>
</tr>
<tr>
<td></td>
<td>• Still includes required performance measures, such as, separate irrigation meters for existing landscapes</td>
</tr>
<tr>
<td></td>
<td>• Includes statement that recommendations must support economic productivity of CII sector</td>
</tr>
</tbody>
</table>
## Proposed Amendments to SB 606/AB 1668: Summary Analysis Based on Legislative Priorities

<table>
<thead>
<tr>
<th>Priority</th>
<th>Addressed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting standards and measures must be through stakeholder process with legislative approval</td>
<td>Partially (mostly “no”)</td>
</tr>
<tr>
<td></td>
<td>• Provides one-time authority for SWRCB to adopt standards and performance measures</td>
</tr>
<tr>
<td></td>
<td>• Authorization to update must be through legislature</td>
</tr>
<tr>
<td></td>
<td>• DWR/SWRCB must solicit stakeholder input in developing standards and measures</td>
</tr>
<tr>
<td></td>
<td>• Indoor standard will be included in legislation</td>
</tr>
<tr>
<td></td>
<td>• SWRCB may recommend to legislature update to standard</td>
</tr>
<tr>
<td>Provide alternative target setting methodologies</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Consistent with Framework. Only budget based method.</td>
</tr>
</tbody>
</table>
# Proposed Amendments to SB 606/AB 1668: Summary Analysis Based on Legislative Priorities

<table>
<thead>
<tr>
<th>Priority</th>
<th>Addressed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor irrigation budget: use irrigable acres and exempt commercial agriculture</td>
<td>Yes</td>
</tr>
<tr>
<td>Appropriate and progressive enforcement authority</td>
<td>Partially (mostly “no”).</td>
</tr>
<tr>
<td>• Does not include cease and desist authority.</td>
<td></td>
</tr>
<tr>
<td>• Civil liability for violation of $1,000/day unless violation occurs under critically dry year or emergency, then $10,000/day.</td>
<td></td>
</tr>
<tr>
<td>• No clear definition of “critically dry year”</td>
<td></td>
</tr>
<tr>
<td>• Fines imposed if supplier is in violation of orders issued by SWRCB and regulations issued by SWRCB if violation occurs after 2026</td>
<td></td>
</tr>
</tbody>
</table>
# Proposed Amendments to SB 606/AB 1668: Summary Analysis Based on Legislative Priorities

<table>
<thead>
<tr>
<th>Priority</th>
<th>Addressed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preserve local decision-making in Water Shortage Contingency Plans (WSCPs)</td>
<td>Partially (almost “yes”)&lt;br&gt;Provides flexibility in establishing levels and actions, but includes supply augmentation (carryover supplies) as shortage action&lt;br&gt;• All supplies should be considered when calculating shortage level</td>
</tr>
<tr>
<td>Ensure future emergency mandates factor in local supply availability</td>
<td>Yes&lt;br&gt;Legislative intent that when Governor declares emergency, SWRCB defer to implementation of locally adopted WSCPs, to the extent practicable</td>
</tr>
<tr>
<td>Maintain UWMP and WSCP as planning documents not regulation</td>
<td>Yes&lt;br&gt;• No enforcement authority granted to SWRCB.&lt;br&gt;• If not in compliance, supplier is not eligible for any state water grants/loans</td>
</tr>
</tbody>
</table>
Public Goods Charge on Water

Legislation and Public Outreach Committee
August 24, 2017
SB 623 (Monning)
- SB 623 amended on August 21 to advance three sustainable funding opportunities:
  - Safe and Affordable Drinking Water Fee
  - Fertilizer Safe Drinking Water Fee
  - Dairy Safe Drinking Water Fee
- SB 623 heard in Assembly Appropriations Committee on August 23
  - Referred to Assembly Appropriations Committee suspense file
  - Deadline to advance to Assembly Floor is September 1
Public Goods Charge on Water

- **Structure of water tax**
  - $0.95/month on each residential retail account (with water meter less than one inch in size)
  - Up to $10/month on each CII account (dependent on meter size – two inches+)

- **Revenue**
  - Estimated at approximately $160 M annually statewide
    - Projected $30 M contribution by agriculture
    - Projected $130 M contribution by urban water users

- Preliminary analysis indicates $10 M in annual water tax revenue from San Diego region
Public Goods Charge on Water

- Stated need for new funding
  - **Safe drinking water needs** – estimated at $100–$200M annually
  - **Low-income water rate assistance** – estimated at $500M annually
  - **Watershed protection and enhancement** – estimated at $3B total

- SB 623 intended to address safe drinking water needs...for now
- Low-income water rate assistance analysis gaining momentum
Advocacy on SB 623

- Remove the water tax from the bill
  - Broad acknowledgment that there is a funding need for O&M within disadvantaged communities – *but other funding sources exist*:
    - State General Fund
    - Cap-and-trade funds
    - Safe drinking water state revolving fund
    - General obligation bonds
  - State law sets forth policy that there is a “Human Right to Water”
    - Not sound public policy to tax something that is a human right
  - Adding a tax on water works against keeping water affordable for all Californians
  - Adding a water tax on the bill limits ability of local water boards to increase rates for their own infrastructure needs
Next Steps on SB 623

- Broad support for SB 623
  - Environmental justice community
  - Agricultural/dairy communities

- Broad opposition to SB 623
  - Water community
  - Business community beginning to weigh in

- September 1 – fiscal committee deadline

- SB 623 would need to pass Assembly Floor and Senate Floor before September 15
  - 2/3 vote bill
Modernizing the System
California WaterFix

Roger K. Patterson, Assistant General Manager
August 24, 2017
San Diego County Water Authority
Imported Water Committee Meeting
Southern California Water Portfolio

- 25% Colorado River
- 30% State Water Project (through the Delta)
- 45% Local Supplies
  - Los Angeles Aqueduct
  - Conservation
  - Groundwater
  - Recycling
  - Desalination
Metropolitan’s Board Policy Adopted 2007
Benchmarks for a Delta Solution

- Provide water supply reliability
- Enhance ecosystem habitat throughout the Delta
- Allow flexible operations in dynamic fishery environment
- Improve water quality
- Reduce seismic risks
- Reduce climate change risks
Existing SWP and CVP Export Facilities are Located in the South Delta
Key Delta Risks

Fishery Declines
Delta smelt

Seismic Risk
Bay Area Faults

Subsidence

Sea Level Rise
SWP-CVP Export Capability Has Declined Due to Regulations

Annual Average Export Capability (MAF)

- 1980's
- 1991 NMFS BiOp
- 1992 CVPIA
- 1994 Accord
- 2000 Trinity River Flows
- 2006 San Joaquin Flows
- 2008-9 Smelt/Salmon BiOps
- Future

Future value is represented by a question mark.
What is the Preferred Solution?
Alternatives Analyzed – State/Federal

- 11 Years – Planning Agreement October 6, 2006
- Public Draft EIR/S
  - 16 alternatives
    - No Action
    - Isolated Conveyance (Pipeline/Tunnel/Canal)
    - Through-Delta
    - Dual Conveyance
- Recirculated EIR/S
  - Three additional sub-alternatives
- California WaterFix
  - Preferred alternative
Main Tunnels

- Twin bore main tunnels
- 30 miles long each
- 150 ft below grade
- 2-foot thick concrete liner
- 40-ft internal diameter
- Gravity flow
Who will build the Project?
Design and Construct Authority

- Single-purpose organization – Joint Powers Authority
- Under contract with State DWR
- Independent staffing
- World-class expertise and methods
- Sunsets at completion of project commissioning
What are the Project Benefits?
Total Average Delivery Capability With and Without CA WaterFix

- **Existing Conditions**: 4.71
- **Future without CA WaterFix**: 3.5 to 3.9
- **Future with CA WaterFix**: 4.74 to 5.35

1 California WaterFix EIR/EIS No Action Alternative, existing conditions with 2025 climate change impacts
2 2015 Delivery Capability Report Existing Conveyance High Outflow scenario
3 2015 Delivery Capability Report Existing Conveyance Low Outflow scenario
4 California WaterFix EIR/EIS Alternative 4A-H4, initial operating criteria lower range
5 California WaterFix EIR/EIS Alternative 4A-H3, initial operating criteria upper range
North Delta Bypass Criteria Protect Flows, Water Quality, and Fish

Sacramento River Flow

- No Diversions: 5,000 cfs
- 0 to 540 cfs: 9,000 cfs
- 900 to 3,000 cfs: 15,000 cfs
- 1,600 to 7,000 cfs: 20,000 cfs
- 9,000 cfs (and above): > 35,000 cfs
Increased export with California WaterFix ~ 781,000 acre-feet (thru Feb 17)
SWP/CVP export losses due to BioOp ~ 800,000 AF (larger amount of SWP loss)
Analysis by State Water Contractors – Feb 2013
Enhance Ecosystem Fishery Habitat Throughout Delta

- Improved flow patterns
- Reduced risk of entrainment
- Physical habitat actions
California WaterFix Improves Water Quality
27% salinity reduction

- Sacramento River: 100 mg/l
- San Joaquin River: 320 mg/l
- Colorado River: 650 mg/l

SWP (Existing)
- Sacramento River: 302 mg/l

SWP (Cal Water Fix)
- Sacramento River: 100 mg/l (27% improvement)
- San Joaquin River: 320 mg/l
- Colorado River: 650 mg/l

- Sacramento, San Joaquin & Colorado River water quality represents historical average annual recorded data
- State Water Project water quality is a comparison of modeled data from the Recirculated Draft EIR/EIS
CA WaterFix Provides Sea Level Rise Adaptation

Sea Level Rise Effects with CA WaterFix (Drought Conditions)

Analysis conducted by CH2M for Metropolitan Water District

Salinity lines indicate 2,000 ppm TDS

Elevation ~13’

Elevation ~3’

SWP Pumps

CVP Pumps
Potential Water Transfer Capability

SWP and CVP Total

Data represents modeled transfer capability; Seller willingness & actual deliveries not represented.

Preliminary State Water Contractor analysis - Subject to Revision.
Cost Estimate and Cost Allocation
# Cost Estimate Comparison

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Estimate 1 5RMK Inc. (Billions) (^{1,2})</th>
<th>Estimate 2 Jacobs Engineering (Billions) (^{1,2})</th>
<th>Estimate 3 Risk Adjusted with Mitigation at 75% Confidence Interval (Billions) (^{1,3})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>$9.50</td>
<td>$8.86</td>
<td>$10.66</td>
</tr>
<tr>
<td>Contingency</td>
<td>$3.38</td>
<td>$3.15</td>
<td>----</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>$12.88</strong></td>
<td><strong>$12.01</strong></td>
<td><strong>$10.66</strong></td>
</tr>
<tr>
<td>PM/CM/Eng</td>
<td>$1.91</td>
<td>$1.91</td>
<td>$1.91</td>
</tr>
<tr>
<td>Land acquisition</td>
<td>$0.15</td>
<td>$0.15</td>
<td>$0.15</td>
</tr>
<tr>
<td><strong>Overall Total</strong></td>
<td><strong>$14.94</strong></td>
<td><strong>$14.07</strong></td>
<td><strong>$12.72</strong></td>
</tr>
</tbody>
</table>

1. Program estimates in 2014 dollars
2. ~36% contingency on construction for 5RMK and Jacob Engineering estimates
3. Based on risks known at time of assessment
## California WaterFix
### Capital Cost

<table>
<thead>
<tr>
<th>ITEM</th>
<th>2014 ($ Billions)</th>
<th>2017 ($ Billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conveyance Facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Construction</td>
<td>9.5</td>
<td>10.4</td>
</tr>
<tr>
<td>• Contingency for construction (~36%)</td>
<td>3.4</td>
<td>3.7</td>
</tr>
<tr>
<td>• Program Mgmt.</td>
<td>Construction Mgmt.</td>
<td>Engineering</td>
</tr>
<tr>
<td>• Land acquisition (includes 20% contingency)</td>
<td>.15</td>
<td>.16</td>
</tr>
<tr>
<td>Subtotal</td>
<td><strong>14.9</strong></td>
<td><strong>16.3</strong></td>
</tr>
<tr>
<td>Mitigation</td>
<td>.37</td>
<td>.40</td>
</tr>
<tr>
<td>Total</td>
<td><strong>$15.3 B</strong></td>
<td><strong>$16.7 B</strong></td>
</tr>
</tbody>
</table>
California WaterFix
Capital Cost Share

- Capital & Mitigation: $16.7 billion (1)
- Central Valley Project: $7.5 billion (45% share)
- State Water Project: $9.2 billion (55% share)

Metropolitan Water District: $4.3 billion (26% share of total)

1. In 2017 dollars
California WaterFix
Cost Allocation

- Key Principles
  - Beneficiaries Pay
  - Costs follow benefits

- Key Financing Assumptions
  - 55% SWP / 45% CVP split
  - 26% – Metropolitan’s share
  - 40-year bond term
  - 4%, 6%, 8% bond rate scenarios (current market rate ~ 3.9%)
  - Capital costs are debt financed
  - Operation & maintenance costs are paid as incurred

Cost of WaterFix
100%

- Central Valley Project
  - 45% of total

- State Water Project
  - 55% of total

- Other SWCs
  - 53% of SWP
  - 29% of total

- Metropolitan
  - 47% of SWP
  - 26% of total
Cost and Rate Impacts
Cost Impact Summary
in 2017 Dollars

<table>
<thead>
<tr>
<th>State Water Project Share</th>
<th>Base Case 4% Interest</th>
<th>6% Interest Scenario</th>
<th>8% Interest Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWP Total Annual Costs (Capital + O&amp;M)</td>
<td>$438 M</td>
<td>$567 M</td>
<td>$709 M</td>
</tr>
<tr>
<td>Metropolitan’s Share Annual Project Cost</td>
<td>$207 M</td>
<td>$268 M</td>
<td>$334 M</td>
</tr>
<tr>
<td>Metropolitan’s Cost Impact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metropolitan’s Overall Cost Increase</td>
<td>13%</td>
<td>17%</td>
<td>21%</td>
</tr>
<tr>
<td>Annual Cost Increase (spread over 15-yrs)</td>
<td>0.9%</td>
<td>1.1%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Average Cost Increase per AF Sold</td>
<td>$122/AF</td>
<td>$157/AF</td>
<td>$196/AF</td>
</tr>
</tbody>
</table>

(1) Based on Metropolitan’s 2017/18 Revenue Requirement of $1,574 M
(2) Based on Metropolitan’s 2017/18 sales budget of 1.70 million acre-feet
Calculation Method and Assumptions
- Residential water use = ~70% of total regional water use
- Metropolitan’s service area = ~6.2 million occupied households
- Household impact estimate calculation:
  - Monthly Impact = (Annual Cost x .70) / 6.2 million / 12 months

Household Impacts
- Base Case
  - $1.90 = ($207M x .70) / 6.2 Million / 12
- 6% Interest Case
  - $2.50 = ($268M x .70) / 6.2 Million / 12
- 8% Interest Case
  - $3.10 = ($334M x .70) / 6.2 Million / 12
Water supply reliability
Costs - Alternatives?
WaterFix Illustrative Marginal Cost
Delivered & Treated to MWD Service Area

Calculation Method and Assumptions
- Marginal cost of WaterFix at Delta pumps = $613/AF
- Marginal cost to convey & treat SWP supply = $227/AF
  - Power for transportation = $197/AF
  - Variable treatment costs = $30/AF
- Marginal cost in MWD Service Area
  - Marginal Costs at Delta Pumps + Power & Variable Treatment

$840 per AF = $613 + $227
California WaterFix Maintains Cost and Rate Stability

**California WaterFix vs. Alternative Supplies**

- **California WaterFix**
  - $840-$1,218/AF**

- **Desalination**
  - $1,859-$2,367/AF***

- **Recycled Water**
  - $1,222-$3,244/AF***

- **Distributed Household Stormwater Capture**
  - $3,758-$5,414/AF***

*Based on Metropolitan’s 2017 Full Service Tier 1 Treated Rate of $979 plus WaterFix costs ranging from $122/AF to $196/AF.*
MWD Board Review Process

- **Process**
  - Three Joint WP&S and Bay-Delta Committee Meetings
  - Workshop & Special Board Meeting

- **Three white papers**
  - Infrastructure
  - Operations
  - Finance/Cost Allocation
Questions

Roger K. Patterson
rpatterson@mwdh2o.com

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California WaterFix Update


Imported Water Committee
August 24, 2017

Amy Chen, Director of MWD Program
Water Authority’s Support for Fixing Bay Delta

- Water Authority supports a sustainable Bay–Delta solution
- 2009 Delta Reform Act
- 2012 Delta Policy principles
- Multi-disciplinary team review of BDCP
- Board took no position on BDCP: lack of key information
Unanswered Questions From Last Review

How much will the project cost?

What portion of the costs will San Diego be expected to pay?

How much water will San Diego County receive?

What other agencies will commit to pay for the project?

How will San Diego County ratepayers be protected from paying an unfair share?
Operational Rules Have Major Impact on Supply Yield

- WaterFix supply benefit:
  - Projected supply with WaterFix – projected supply without WaterFix
- Operating rules affect water supply
  - Biological opinions; State Board’s decisions; adaptive management and real-time operations; future listing of species
- Baseline: important to measure supply benefit
Baseline Critical in Determining Supply Benefit

- **“Future with WaterFix:”** 4.7 – 5.3 MAF
  - BiOps and State Board decisions not included
- **“Existing Conditions:”** 4.7 MAF
  - Current regulations with climate change
- **“Future without WaterFix,” (AKA “baseline”):** 3.5 – 3.9 MAF
  - Increased regulations beyond current regulations
  - Leave more outflows in system
- **WaterFix “benefits:”** 172 TAF – 1.3 MAF
  - Depending on “baseline” chosen
Cost Assumptions

- Capital: $16.7B*
- O&M: $64M/yr
- 100% financed, over 40 years with interest rates at 4%, 6%, or 8%
- Annual cost: $796M – $1,287M (@4% – 8%)
- Cost split between CVP/SWP: 45/55

* In 2017$
Cost Assumptions – MWD Share

- Assumed: 26%, $4.3B
- $207M – $334M/ year
  - Spread over transportation rates
  - $122/AF – $196/AF (1.7 MAF)
    - Adds ~$34M – $55M on Water Authority’s QSA transfers*
  - $146/AF – $235/AF (1.42 MAF*), 20% increase over MWD’s estimate

* At full QSA implementation of 280 TAF
Unresolved Issues

- Contractors’ participation level
  - CVP at 45% questionable
    - Exchange Contractors and wildlife refuges
    - Participation levels of 20% – 45% being considered
  - SWP contractors
    - 55% – 80%
    - “Permanent Table A adjustment”

- Financing
  - “Finance JPA” – unknown terms and participants
  - ”Gap” funding – terms undisclosed
    - Complete pre-construction work previously estimated ~$1 billion
    - Continue funding project until JPA issues bonds
Unresolved Issues (cont.)

- Pending regulatory processes
  - USFWS review, State Board water rights hearings
- Marginal WaterFix cost higher, if benefit assumptions do not materialize
  - $614/af – $2,361/af
- MWD’s application of WaterFix cost on rate
  - Spread over transportation rates disproportionately affects Water Authority
<table>
<thead>
<tr>
<th>Questions</th>
<th>How White Papers Address Them</th>
</tr>
</thead>
<tbody>
<tr>
<td>• How much will WA pay?</td>
<td>• Does not say</td>
</tr>
<tr>
<td>• How much water will WA get?</td>
<td>• Does not say</td>
</tr>
<tr>
<td>• Which contractors will commit to pay?</td>
<td>• Does not say</td>
</tr>
<tr>
<td></td>
<td>• Five north–of–Delta SWP contractors “excused”</td>
</tr>
<tr>
<td>• How will WA ratepayers be protected from pay unfair share?</td>
<td>• They will not: MWD plans to charge on transportation rates (adds $55M/yr)</td>
</tr>
<tr>
<td>• Will MWD require firm financial commitment from MA?</td>
<td>• No</td>
</tr>
<tr>
<td>• Will cost of project hamper local supply development?</td>
<td>• Does not address</td>
</tr>
</tbody>
</table>
Considerations

WaterFix addresses

- Some ESA issues
  - Reverse flows
- Salinity
- Seismic events in Delta
- Climate change

Decision considerations

- Right-sized project?
- Risks
- Impacts to local supply development
- Cost to Water Authority ratepayers

Will net supply benefits outweigh risks?