Water Treatment Operations

Engineering and Operations Committee
July 27, 2017

Sandra L. Kerl
Deputy General Manager
Source water changes and decreased demands have resulted in water quality challenges and membrane treatment impacts.
Source water changes

- Rapid switch from Colorado River Water to State Project Water
  - Treatability challenges
  - Increased disinfection by-product formation
- Algal bloom in Agua Hedionda Lagoon
  - Membrane fouling

Decreased water demands
- Increased nitrification
Water Authority has developed two sources of treated water:
- Twin Oaks Water Treatment Plant
- Claude “Bud” Lewis Desalination Plant

Both plants are highly complex, sophisticated, and equipment intensive - producing high quality drinking water

Source water changes have impacted their treatment capacity
Water Treatment Plants (cont.)

Twin Oaks Valley Water Treatment Plant
- Developed under design-build-operate agreement
- Placed in operation in December 2007
- Owned by Water Authority
- Operated by CH2M
- Design capacity – 100 MGD

Claude “Bud” Lewis Carlsbad Desalination Plant
- Developed under P3 agreement
- Placed in commercial operation December 2015
- Owned by Poseidon
- Operated by IDE
- Design capacity – 50 MGD
Twin Oaks Valley Water Treatment Plant

Operational and Maintenance Challenges

- Membrane Bio-Fouling (iron and manganese)
  - Source is from backwash recovery process
  - Designed as “zero discharge” plant
  - No sewer access
- Source Water Changes – Switch from Colorado River Water to State Project Water
  - Increased TOC has resulted membrane bio-fouling

Corrective Actions

- Membrane Replacement
- Pilot Studies
  - Improvement of cleaning process and disposal of cleaning solutions
  - Removal of iron and manganese
Carlsbad Desalination Plant

Operational and Maintenance Challenges

- Source Water Changes - Membrane bio-fouling due to significant algal bloom in Agua Hedionda Lagoon

Corrective Actions

- Membrane Replacement
- Off-Site Membrane Cleaning
- Investigate Alternative Cleaning Frequencies and Solutions
- Operate at Lower Recovery Levels
Summary

- Poseidon/IDE and CH2M Staff are proactively working to identify necessary operational actions
- Poseidon/IDE staff learning unique water quality characteristics and conditions within Agua Hedionda Lagoon
- No impact to meet member agency demands
- No financial impact to Water Authority
Carlsbad 1 Site Assessment
Carlsbad 1 FCF Assessment
Turnout Vault Assessment
Site Challenges
Site Challenges
Shutdown 1, PL 3 Turnout - Isolation
Shutdown 1, PL 4 Turnout - Isolation

2/19/2017
Shutdown 1, PL 4 Turnout - Isolation
PL 3 Turnout Structure - Rehab
PL 3 Turnout Structure - Rehab
Carlsbad 6 FCF- Construction
Carlsbad 6 FCF- Construction
Carlsbad 6 FCF- Construction
## Change Order Status

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Original Contract Amount</td>
<td>$2,786,250</td>
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<tr>
<td>Current Change Orders</td>
<td>$38,703</td>
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<tr>
<td>Current Contract Amount</td>
<td>$2,824,953</td>
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</table>
Schedule

Shutdown 2  
Connect Pipeline 3 & 4  
November 2017

Project Completion  
March 2018

Notice of Completion  
(Board Action)  
April 2018
Link to DWR videos regarding Oroville spillway repairs.

https://www.youtube.com/playlist?list=PLEod6x87Tu6eVFnSyEtQeOVbxvSWywPlx
Project Purpose

- Extend the life of large diameter pre stressed concrete cylinder pipe (PCCP).
Project Overview

- Relining Approximately 22,800 Feet of Existing Pipe
- 17 Access Portals
- 23 Temporary Construction Easements
- Demolishing Four Flow Control Facilities
- Coordination with State, County, City and Member Agencies
Community Outreach

- Extensive community outreach plan
  - Two community meetings, 2016
  - La Mesa Chamber of Commerce events
- Upcoming events
  - Pre-construction preparation and construction outreach
  - Participate in existing community events
- www.sdcwa.org/lake-murray-sweetwater-reservoir-pipeline-3-relining-project
Bid Summary

Advertised Bid Range: $31 to $36 Million

<table>
<thead>
<tr>
<th>NO.</th>
<th>GENERAL CONTRACTOR</th>
<th>BID AMOUNT</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>L.H. Woods &amp; Sons, Inc.</td>
<td>$28,570,000</td>
</tr>
<tr>
<td>2</td>
<td>J.F. Shea Construction, Inc.</td>
<td>$31,548,780</td>
</tr>
<tr>
<td>3</td>
<td>Kiewit Infrastructure West Co.</td>
<td>$32,145,700</td>
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</tbody>
</table>
Recommendation

- Authorize the General Manager to award a construction contract to L.H. Woods and Sons, Inc. in the amount of $28,570,000 for the Pipeline 3 Relining Lake Murray to Sweetwater project

- Authorize the General Manager to execute an Agreement between San Diego Gas & Electric and the San Diego County Water Authority, in the amount of $481,467, to reimburse SDG&E for its costs to remove and replace a 16-inch high-pressure gas main utility conflict.
Amendments to the Administrative Code

Administrative and Finance Committee
July 27, 2017

Mark J. Hattam
General Counsel
Two Proposed Code Changes

1. **Non-Use Of Personal Electronics In Closed Session (Section 2.00.080(k)(2))**

   - Protects confidentiality of critical closed session matters.
   - Limited impact on convenience (closed session only, not entire Board day, as some agencies have done).
2. *Bring Board Member Meal Reimbursement Up To Date (Section 2.05.020(g))*

- Current section based on 2006 dollars. This change brings reimbursements current.
Recommendation

- General Counsel recommends that the ordinance amending Chapter 2.00 and Chapter 2.05 of the Administrative Code be adopted.
San Diego County Water Authority

Period Ending
June 30, 2017
Consolidated Investment Objectives

The investment policies and practices of the Board of Directors and the Treasurer for the San Diego County Water Authority are based upon limitations placed on it by governing legislative bodies. These policies have three primary goals:

1. To assure compliance with all Federal, State and Local laws governing the investment of monies under the control of the Treasurer.
2. To protect the principal monies entrusted to this organization.
3. To generate the maximum amount of investment income within the parameters of this Annual Statement of Investment Policy.

Chandler Asset Management Performance Objectives

Chandler’s mandate is to invest in corporate and municipal securities with final maturities of 5 years or less.

The performance objective is to achieve a rate of return over a market cycle that equals or exceeds the return on a market index of similar duration and sector allocation.

Strategy

In order to achieve these objectives, Chandler invests in high quality corporate securities consistent with the investment policy and California Government Code.
Assets managed by Chandler Asset Management are in full compliance with State law and the Investment Policy.

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard</th>
<th>Comment</th>
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<tr>
<td>U.S. Corporate (MTNs)</td>
<td>&quot;A&quot; or higher by a NRSRO (Moody's, S&amp;P, and Fitch); If more than one NRSRO rates a security, then all ratings must meet the requirement; Issued by corporation organized and operating within the U.S. or by depository institutions licensed by the U.S or any state and operating within the U.S.</td>
<td>Complies</td>
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<tr>
<td>Maximum Maturity</td>
<td>5 years maximum maturity</td>
<td>Complies</td>
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San Diego County Water Authority

<table>
<thead>
<tr>
<th></th>
<th>06/30/2017</th>
<th>06/30/2016</th>
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<tbody>
<tr>
<td><strong>Benchmark</strong>*</td>
<td><strong>Portfolio</strong></td>
<td><strong>Portfolio</strong></td>
</tr>
<tr>
<td>Average Maturity (yrs)</td>
<td>2.81</td>
<td>2.21</td>
</tr>
<tr>
<td>Modified Duration</td>
<td>2.67</td>
<td>2.08</td>
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<tr>
<td>Average Purchase Yield</td>
<td>n/a</td>
<td>1.74 %</td>
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<tr>
<td>Average Market Yield</td>
<td>2.01 %</td>
<td>1.75 %</td>
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<tr>
<td>Average Quality**</td>
<td>AA</td>
<td>AA/Aa2</td>
</tr>
<tr>
<td>Total Market Value</td>
<td>32,222,445</td>
<td>30,682,289</td>
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</table>

* BAML 1-5 Yr US Corporate Rated AAA-AA Index
** Benchmark is a blended rating of S&P, Moody's, and Fitch. Portfolio is S&P and Moody's respectively.

Transactional activity in the portfolio has been light during the past twelve month due to cash flow constraints at the Authority, restricting new cash flows to be allocated into the all corporate strategy. Additionally, prior to the adoption of the updated investment policy in early 2017, the investment opportunities in eligible investments were unattractive in Chandler’s judgement. During the first quarter of 2017 the Chandler team executed a swap to take advantage of the broader investment policy. In June, staff informed Chandler additional monies were available and a new security was purchased.

Due to the lack of new monies allocated to the strategy over the past twelve months and the policy constraints on selling securities, the characteristics of the portfolio deviated materially from the benchmark over the course of the year. The one year performance number, relative to the benchmark underperformed, however on a two year annualized basis the strategy return is close to the benchmark.
## Issuers – Chandler Managed Portfolio

### San Diego County Water Authority – Account #10285

As of 6/30/2017

<table>
<thead>
<tr>
<th>Issue Name</th>
<th>Investment Type</th>
<th>% Portfolio</th>
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<tbody>
<tr>
<td>Berkshire Hathaway</td>
<td>US Corporate</td>
<td>12.55%</td>
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<tr>
<td>US Bancorp</td>
<td>US Corporate</td>
<td>12.55%</td>
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<tr>
<td>ChevronTexaco Corp</td>
<td>US Corporate</td>
<td>12.51%</td>
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<tr>
<td>Exxon Mobil Corp</td>
<td>US Corporate</td>
<td>12.49%</td>
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<tr>
<td>Apple Inc</td>
<td>US Corporate</td>
<td>12.32%</td>
</tr>
<tr>
<td>Bank of New York</td>
<td>US Corporate</td>
<td>6.31%</td>
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<tr>
<td>PNC Financial Services Group</td>
<td>US Corporate</td>
<td>6.31%</td>
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<tr>
<td>Microsoft</td>
<td>US Corporate</td>
<td>6.26%</td>
</tr>
<tr>
<td>Procter &amp; Gamble Company</td>
<td>US Corporate</td>
<td>6.25%</td>
</tr>
<tr>
<td>Wal-Mart Stores</td>
<td>US Corporate</td>
<td>6.25%</td>
</tr>
<tr>
<td>Toyota Motor Corp</td>
<td>US Corporate</td>
<td>6.17%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100.00%</strong></td>
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</table>
San Diego County Water Authority

Portfolio Compared to the Benchmark as of June 30, 2017

<table>
<thead>
<tr>
<th>Duration Range</th>
<th>Portfolio</th>
<th>Benchmark*</th>
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<tbody>
<tr>
<td>0 - 0.25</td>
<td>0.0%</td>
<td>0.0%</td>
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<tr>
<td>0.25 - 0.50</td>
<td>0.0%</td>
<td>0.0%</td>
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<tr>
<td>0.50 - 1</td>
<td>24.9%</td>
<td>0.3%</td>
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<tr>
<td>1 - 2</td>
<td>18.6%</td>
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<td>2 - 3</td>
<td>37.7%</td>
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<td>3 - 4</td>
<td>6.2%</td>
<td>30.7%</td>
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<td>4 - 5</td>
<td>12.6%</td>
<td>12.4%</td>
</tr>
<tr>
<td>5+</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
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</table>

*BAML 1-5 Yr US Corporate Rated AAA-AA Index
Total rate of return: A measure of a portfolio’s performance over time. It is the internal rate of return, which equates the beginning value of the portfolio with the ending value; it includes interest earnings, realized and unrealized gains and losses in the portfolio.
AB 1361 (Garcia) – Water Service to Tribal Lands

- AB 2470 (Gonzalez) – 2016 legislation sponsored by Sycuan Tribe
  - “Virtual annexation” to municipal water district
  - Amendments offered by Water Authority and retail water agencies
    - Protect existing customers
    - Protect water suppliers’ interests
  - Accepted into bill – all protections currently embodied in statute

- AB 1361 is modeled after AB 2470
  - Would apply more broadly to all Tribes – statewide
  - Protections for water suppliers retained in statute and untouched
  - Water supplier retains discretion to provide service

- AB 1361 is pending consideration on Senate Floor

- Staff recommends the Board adopt a Support position on AB 1361 (Garcia)
Sacramento Update

Legislation and Public Outreach Committee
July 27, 2017

Glenn Farrel, Government Relations Manager
Legislature

- July 21: Legislature began Summer recess
- August 21: Legislature returns from Summer recess
- September 1: Fiscal committee deadline
- 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
  - Pending hearing in Senate Appropriations Committee

- **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
  - Pending hearing in Assembly Appropriations Committee
Public Goods Charge on Water

- **SB 623 (Monning)**
  - Author has indicated intent to amend SB 623 to advance two sustainable funding opportunities:
    - Public goods charge/water tax
    - Fertilizer tax
  - Stated need for new funding
    - Safe drinking water needs – estimated at $200M annually
    - Low-income water rate assistance – estimated at $500M annually
    - Watershed protection and enhancement – estimated at $3B total
  - Pending hearing in Assembly Appropriations Committee
Resources Bond Measures

- Five parks/resources/water general obligation bond measures currently in play:
  - **Legislative**
    - **AB 18 (Garcia)** – $3.105 billion parks/resources bond – June 5, 2018 statewide primary election ballot
    - **SB 5 (De Leon)** – $3.5 billion parks/resources/water bond – June 5, 2018 statewide primary election ballot
    - **SB 701 (Hueso)** – $500 million Salton Sea restoration bond – November 6, 2018 statewide general election ballot
  - **Ballot Initiative**
    - **Joe Caves**: $7.5 billion parks/resources bond – filed with AG on June 30
    - **Gerald Meral**: $8.365 billion parks/resources/water bond – filed with AG on July 14
Little Hoover Commission

- June 14: LHC issued a series of “potential recommendations” related to special districts:
  - Governance
  - Transparency
  - Climate change adaptation
  - Healthcare districts

- June 22: LHC convened a roundtable meeting on special districts
  - 19 invited participants – dozens of public speakers
  - Primary focus was on governance and transparency

- Next steps
  - LHC will issue written summary of June 22 meeting
  - LHC will publish draft report on special districts’ study by end of August 2017
Update on Long-Term Water Use Efficiency Legislation

Legislation and Public Outreach Committee
July 27, 2017

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

Budget Trailer Bill #1

AB 641 (Harper)   AB 869 (Rubio)
AB 723 (Arambula) AB 968 (Rubio)
SB 606 (Hertzberg/Skinner)
AB 1000 (Friedman) AB 1041 (Levine)
AB 1323 (Weber)
AB 1667 (Friedman) AB 1669 (Friedman)
AB 1271 (Gallagher) AB 1654 (Rubio)

Budget Trailer Bill #2

AB 1668 (Friedman)
AB 1273 (Gallagher)
## Water Use Efficiency Legislation

<table>
<thead>
<tr>
<th>BILL</th>
<th>SYNOPSIS</th>
<th>WA POSITION</th>
<th>STATUS</th>
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<tbody>
<tr>
<td>AB 1323 (Weber)</td>
<td>DWR stakeholder workgroup</td>
<td>Sponsor</td>
<td>Senate Approps</td>
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<tr>
<td>AB 1654 (Rubio)</td>
<td>Intent language only</td>
<td>Support/Co-Sponsor</td>
<td>Senate Approps</td>
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<td>AB 1668 (Friedman)</td>
<td>Intent language only</td>
<td>Oppose Unless Amended</td>
<td>Senate Approps</td>
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<tr>
<td>SB 606 (Hertzberg)</td>
<td>Intent language only</td>
<td>No Position</td>
<td>Assembly Approps</td>
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<tr>
<td>RN 17–09926</td>
<td>Water shortage contingency plan</td>
<td>Oppose Unless Amended</td>
<td>Remains active</td>
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<tr>
<td>RN 17–12268</td>
<td>Long-term WUE targets</td>
<td>Oppose</td>
<td>Remains active</td>
</tr>
</tbody>
</table>
Water Use Efficiency Legislation

- Senate Natural Resources and Water Committee hearing – July 11
  - Panel presentation – Bill authors and Administration
  - Dozens of stakeholders identifying key issues of interest
  - Committee action
    - AB 1323 (Weber) – Pass in current form to Senate Appropriations Committee (9–0 vote)
    - AB 1654 (Rubio) – Amend to intent language only – pass to Senate Appropriations Committee (9–0 vote)
    - AB 1667 (Friedman) – Hold in committee – two-year bill
    - AB 1668 (Friedman) – Amend to intent language only – pass to Senate Appropriations Committee (7–0 vote)
Next Steps Within Legislature on Long-Term Water Use Efficiency Legislation

- Senator Hertzberg and Assemblymember Garcia
  - Convening working group process involving stakeholders over Legislature’s Summer recess
    - Discussions anticipated to begin during week of July 31
  - ACWA long-term water use efficiency working group composed coalition letter to set marker for initiation of working group negotiations
    - Submitted to Legislature – July 21
1. Preserve legislative authority in setting targets and CII performance measures
   - State agencies should not be granted authority to set targets or performance measures
   - Broad stakeholder process to determine CII performance measures

2. Target setting approach must be flexible to account for differing communities
   - Technically, economically, administratively feasible
   - Provide alternative pathway or functional equivalent method
   - Provide variances that account for unique community attributes
3. Protect existing water rights

4. Incentivize recycled water and potable reuse
   • Recycled water credit
     • MWELO special landscape allowance of 1.0 ETAF
     • Variance to 1.0 ETAF where additional recycled water is needed to maintain landscape
   • Potable reuse credit
     • Potable reuse up to the volume needed to meet efficiency target
   • 55 gpcd indoor target cannot be lowered without an evaluation and report to Legislature on impacts
5. Appropriate and progressive enforcement

- Enforcement mechanism appropriate for circumstances
  - Water supplier does not directly control customers water use behaviors
  - Water supplier controls its own actions to encourage efficiency

- Propose progressive enforcement by SWRCB
  - Supplier failing to meet target prepares remedial plan with additional steps to increase customer efficiency
  - Enforcement action if supplier fails to implement steps

- Focus should be on corrective action instead of cease-and-desist orders
6. Preserve local decision-making
   • Preserve local control in determining and implementing shortage response actions and levels
   • SWRCB shall consider supplier’s local actions in adopting emergency regulations

7. Preserve and encourage investments in resilient water supplies
   • During statewide drought, supplier shall not be required to reduce its use or reliance on available supplies
   • Potable reuse, recycled water and desalination are fully reliable
ACWA Coalition Letter: Policy Principles
Shortage Response Planning

8. Annual assessments based on current year and actual hydrologic conditions


10. Maintain existing requirement that allows suppliers to voluntarily provide information on energy use in UWMPs
California WaterFix Update

MWD White Paper Review: Physical Infrastructure

Imported Water Committee
July 27, 2017

Amy Chen, Director of MWD Program
Gary Bousquet, Senior Engineering Manager
Bay–Delta’s Relevance to Water Authority

State Water Project (Bay-Delta) 17%

Colorado River 68%

Local Supplies and Conservation 15%

Supply %” 2012–2016 average
Unanswered Questions From Last Review

- How much will the project cost?
- How much water will San Diego County receive?
- What portion of the costs will San Diego be expected to pay?
- What other agencies will commit to pay for the project?
- How will San Diego County ratepayers be protected from paying an unfair share?
WaterFix Infrastructure

North Delta
- Three new intakes
- Short tunnels
- Intermediate forebay

Twin Tunnels
- 150 feet below surface
- Two-40 feet diameter
- 30 miles
- 9,000 cfs

South Delta
- Clifton Court
- Old River Gate

Source: MWD
Construction Risks

- Limited Geotechnical Assessments
  - Environmental issues
  - Property access denials

- Subsurface Conditions
  - Variability of soils (clay, sand, silt)
  - Groundwater
  - Boulders/Rocks
Risk Management

- Safety and Risk Management Group
  - Risks affecting scope, schedule or budget
  - Relating to design, construction or operations
Cost Estimates

*MWD Whitepaper*

- Program estimate $15.74B
  - Program Management, construction management and engineering – $1.91B
  - Construction – $9.50B
  - Land Acquisition – $0.15B
  - Contingency – $3.38B (36% of Construction)
  - Environmental Mitigation – $0.80B

All costs in 2014 dollars
Cost Escalation

- Program estimate $15.74B (2014 dollars)
- Construction mid-point – 2027
- Industry standard escalation – 2.5 percent
- Therefore, budget would need to be
  ~ $22 billion to cover costs.
- Delays due to escalation alone would be
  ~ $40 million per month
Project Implementation Structure

Design and Construct Authority

State Department of Water Resources

Joint Powers Authority (Public Agency)

Program Director

- Finance & Accounting
- Public Education
- Internal Audit
- Program Manager
- Legal Counsel
- Safety & Risk Management
Project Implementation

- Structure
- Processes
  - Streamlined approval processes
    - Cost
    - Schedule
    - Operation
    - Permits
  - Well defined dispute resolution processes
    - Technical Review Workgroup (internal)
    - Dispute Process for contractor(s)
- People
Water Authority’s Major Concerns

- Identification and tracking of construction risks during design
- Accurate budgeting for anticipated project costs
- Effective overall risk management
- Strong dispute/Issue resolution processes
Next Steps at MWD

July 25
- Operations whitepaper presented at special committee on Bay-Delta

August 14
- Finance/cost allocation presented at WPS Committee

September 26
- Board Workshop
- Action