Escalating Construction Costs and Impact on Capital Improvement Program

Special Engineering and Operations Committee
March 14, 2019
Agenda

- Purpose of Meeting
- History of Capital Improvement Program (CIP)
- How the CIP is Developed
  - Studies/Planning Efforts
  - Asset Management Program
- CIP Construction Costs
- Next Steps
  - Budget Development
    - Proposed FY2020/2021 Projects
    - Future
Purpose of Meeting

- Strong construction market
- Higher overall construction costs
- Increasing material prices, impacting both maintenance and capital projects
- Greater competition in the labor market
- Escalating wages
- How do we mitigate these issues and develop our recommended CIP budget?
History of Capital Improvement Program (CIP)
History of the CIP

- 1989: CIP created in 1989 with adoption of the Water Distribution Plan
- 1994: Relining Program added to the CIP
- 1998: Board approved implementation of the Emergency Storage Project
- 2003: Master Plan Completed
2003 Master Plan Projects

Projects

PROJECTS SHOWN:

A. Authority Water Treatment Plant
B. Desalinated Water Treatment Plant at Encina
C. Convert Pipeline 3 to Untreated from Crossover to Miramar
D. Desalinated Water Conveyance Facilities
E. Escondido-Vista Treatment Plant Connection
F. Hubbard Hill Flow Regulatory Structure
G. Lower Otay Pump Station
H. Mission Trails Flow Regulatory Structure
I. Mission Trails Pipeline Tunnel and Vent Demolition
J. North County Distribution Pipeline FRS
K. Padre Dam Pump Station Expansion
L. Pipeline from Otay Flow Control Facility 14 to Regulatory Reservoir
M. Poway Pump Station and Treated Water Connection
N. Restore Untreated Water in LMSE to Sweetwater
O. San Diego 12 Expansion
P. San Diego 24/25/26 Flow Control Facility
Q. San Vicente Dam Raise beyond ESP
R. Second Crossover Pipeline
S. Slaughterhouse Terminal Reservoir
Projects

MASTER PLAN DERIVED PROJECTS LOCATION MAP

San Diego County Water Authority
Adopted CIP Budget and FY 2004 and FY 2005 Budget Appropriations

Figure 8
27

PROJECTS SHOWN:
A. Authority Water Treatment Plant
B. Desalinated Water Treatment Plant at Encina
C. Convert Pipeline 3 to Untreated from Crossover to Miramar
D. Desalinated Water Conveyance Facilities
E. Escondido-Vista Treatment Plant Connection
F. Hubbard Hill Flow Regulatory Structure
G. Lower Otay Pump Station
H. Mission Trails Flow Regulatory Structure
I. Mission Trails Pipeline Tunnel and Vent Demolition
J. North County Distribution Pipeline FRS
K. Padre Dam Pump Station Expansion
L. Pipeline from Otay Flow Control Facility 14 to Regulatory Reservoir
M. Poway Pump Station and Treated Water Connection
N. Restore Untreated Water in LMSE to Sweetwater
O. San Diego 12 Expansion
P. San Diego 24/25/26 Flow Control Facility
Q. San Vicente Dam Raise beyond ESP
R. Second Crossover Pipeline
S. Slaughterhouse Terminal Reservoir
History of the CIP

- 1989: CIP created in 1989 with adoption of the Water Distribution Plan
- 1994: Relining Program added to the CIP
- 1998: Board approved implementation of the Emergency Storage Project
- 2003: Master Plan Completed
- 2004: Relining Program expanded
2007: Comprehensive Reliability and Cost Assessment (CRACA)
Comprehensive Reliability and Cost Assessment

- **2008/2009:** CIP re-costed to reflect market trends and refined scope

- **2010/2011:** Studies updated forecasted regional water demands. Investigates timing/re-prioritizing of future projects

- **2012/2013:** Board approves re-prioritized CIP and deferral of 14 projects. Shifts expenditures of $150 million. Defers additional debt and potential rate impacts
Comprehensive Reliability and Cost Assessment

- CRACA- Lessons Learned
  - Track commodity and resource prices
  - Follow American Association of Cost Engineers (AACE) best practices
  - Perform independent cost estimates
  - Coordinate bidding with local agencies
  - Prioritization based on risk
History of the CIP (cont’d)
History of the CIP (cont’d)

Historical Spending

$Millions


This chart shows the historical spending from FY2000 to FY2019, with a peak in FY2007 and a decline in subsequent years.
History of the CIP (cont’d)

- 2014: Focus on Asset Management Program

San Vicente Dam Raise and Carryover Storage
History of the CIP (cont’d)

2018: Focus on Asset Management Program

“OLD” Carlsbad 1 Flow Control Facility
History of the CIP (cont’d)

- **2018:** Focus on Asset Management Program

“NEW” Carlsbad 6 Flow Control Facility
Investments in Supply Reliability

Twin Oaks Valley Water Treatment Plant
$179 million

Olivenhain Dam & Reservoir
$198 million

San Vicente Dam Raise & Related Projects
$811 million

Lake Hodges Hydroelectric and Pump Station Facility
$208 million

Pipeline Relining
$493 million

Carlsbad Seawater Desalination
$1 billion

All-American & Coachella Canal Lining Project
$447 million ($190 million from Water Authority)
Questions
How the CIP is Developed
How the CIP is Developed

- Facilities Planning (Water Resources)
  - Projects resulting from detailed alternatives assessments

- Asset Management (Operations & Maintenance)
  - Rehabilitation/replacement projects for existing facilities
How the CIP is Developed - Studies/Planning Efforts
Long-Range Demand Forecast

- Updated every 5 years
  - Coincides with state-mandated Urban Water Management Plan updates

- 25-year planning horizon

- Utilizes econometric model to project sector-level demands

- Based on demographic and economic projections from the San Diego Association of Governments
Land-Use and Water Supply Coordination

San Diego Region

- Cities/County General Plans
- SANDAG’s Regional Growth Forecast
- Projected Water Demands
- Urban Water Management Plan

- SDCWA Facilities Master Plan
- Water Assessment (SB 610) Written Verification (SB 221)
- Cities/County Plans & Policies
Building Consensus for New CIP Projects

1. Master Plan Recommended Projects
2. 2-Year Budget Project Planning
3. Board Approval
4. 2-Year Budget Project Design/Construction
CIP Development - Master Plan Update

- FY2020/2021 Scoping Effort
  - Build from Demand Forecast Update in 2020 Urban Water Management Plan

- FY2022/2023 Develop Master Plan Update

- Key Objectives/Focus Areas
  - System Reliability Assessment
  - Regional Conveyance Capacity Optimization
  - Infrastructure Improvements for Operational Efficiency
  - Energy Management Assessment

- Complete Master Plan Update in 2023
  - Add projects to CIP during FY2024/2025 budget build
San Diego County Water Authority
Our Region’s Trusted Water Leader

Questions
How the CIP is Developed - Asset Management Program
How the CIP is Developed - Asset Management

- Program development
- Process
  - Prioritization
  - Schedule
  - Budgeting
- Project Review
- Next steps
Development

- Previous programs
- Business Plan (2008)
- Asset Management Plan (2009)
1. Inspections
   - Plan (5-year rolling)
   - Technology scan
   - Visual

2. Data Analytics
   - Collect
   - Analyze
   - Visualize
   - Prioritize

3. Recommendations
   - CIP Project Packet
   - AM Committee
   - Board Approval
Pipeline Data

Pipe Condition
1. Wire breaks
2. Wire break frequency
3. Pressure
4. Corrosion
5. Technical analysis

Impact
1. Nearby utilities
2. Surrounding community
3. Redundancy

Impact Analytics - Google Earth
# Facility Data

## Condition
1. Condition - Visual
2. Site - Visual
3. Pipe - Factor of Safety
4. Technical analysis

## Impact
1. Area (Rural/UUrban)
2. Failure impact
3. Redundancy
4. Water delivered
5. Diameter
6. Valve use

---

*Facility Inspection*
Risk Matrix

= Pipeline Sector
Process (Prioritization)

Condition Assessments

Technical Analysis (Engineering)

Facility Planning (Water Resources)

Asset Management Group

Determine Risk Scores

System-Wide Risk Assessment

Risk Matrices

Project Prioritization and Grouping

Determine Project Scope/Appropriation

Prioritization Team [Asset Management + Engineering + Water Resources]
Project Review

Asset Management Committee

Executives

CIP Program Budget

Board Approval
Looking Ahead

- Current budget build

- Future:
  - Asset Management prioritization process (2020)
  - Re-Cost/Review long-term forecast (2021)
  - Incorporate updated long-term forecast (FY2022/2023)
Questions
CIP Construction Costs & Influences
Construction Costs & Influences

- Construction Cost Components
- Past trends
- Current Trends
- Mitigation Measures
Construction Cost Components

- Materials
- Equipment
- Labor
- Competition
- Contractors
Materials, Equipment, & Labor

Annual Percent Change in Indices

- ENR
- Tunnel
- Pipeline Relining
- Concrete Vault
- Pipeline
- Pump Station
Labor Shortage

- Nationwide Shortage
- Skilled and unskilled
Competition & Contractors

- Regional
  - City of San Diego
  - MWD
  - LADWP

- Material Suppliers
  - Pipe
  - Electrical Equipment

- Contractors
## Past Trends

<table>
<thead>
<tr>
<th>Project</th>
<th># of Bidders</th>
<th>Estimate</th>
<th>Bid Amount</th>
<th>Bid Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Vicente Bypass Pipeline</td>
<td>4</td>
<td>$19.0M</td>
<td>$13.9M</td>
<td>Oct ‘14</td>
</tr>
<tr>
<td>Nob Hill Improvements</td>
<td>4</td>
<td>$12.2M</td>
<td>$9.9M</td>
<td>Jul ’15</td>
</tr>
<tr>
<td>Miramar Pump Station Rehabilitation</td>
<td>8</td>
<td>$5.0M</td>
<td>$4.1M</td>
<td>Oct ’15</td>
</tr>
<tr>
<td>Pipeline 4 Reline at Lake Murray</td>
<td>3</td>
<td>$7.8M</td>
<td>$6.8M</td>
<td>Jul ’16</td>
</tr>
<tr>
<td>Carlsbad 6 Flow Control Facility</td>
<td>7</td>
<td>$3.5M</td>
<td>$2.8M</td>
<td>Aug ‘16</td>
</tr>
<tr>
<td>Pipeline 3 Relining Lake Murray to Sweetwater</td>
<td>3</td>
<td>$33.5M</td>
<td>$28.6M</td>
<td>Jun ‘17</td>
</tr>
</tbody>
</table>
## Current Trends

<table>
<thead>
<tr>
<th>Project</th>
<th># of Bidders</th>
<th>Estimate</th>
<th>Bid Amount</th>
<th>Bid Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipeline 5 Relining Point of Delivery to Sage Rd</td>
<td>2</td>
<td>$21.0M</td>
<td>$25.3M</td>
<td>Jun ‘18</td>
</tr>
<tr>
<td>San Diego 28 Flow Control / Alvarado Hydro</td>
<td>2</td>
<td>$7.5M</td>
<td>$13.7M</td>
<td>Aug ‘18</td>
</tr>
<tr>
<td>VAL 11 / VID 12 Flow Control</td>
<td>5</td>
<td>$4.4M</td>
<td>$4.6M</td>
<td>Sept ‘18</td>
</tr>
<tr>
<td>Northern 1st Aqueduct Rehabilitation</td>
<td>3</td>
<td>$24.0M</td>
<td>$30.4M</td>
<td>Nov ‘18</td>
</tr>
</tbody>
</table>
Mitigation Measures

- Monitor Material Prices
- Value Engineering
- Cost Estimate Preparation
- Tracking Technology
Mitigation Measures

- Regional Coordination
- Small Contractor Outreach and Opportunities Program

CLEAN 17

American Society of Civil Engineers

American Water Works Association

Our Region’s Trusted Water Leader
San Diego County Water Authority
Questions
Next Steps
Proposed FY2020/2021 CIP Budget

- Prioritize projects
- Adjust project budgets
  - Update estimates, as needed
  - Reflect current cost trends
Proposed FY2020/2021 Projects

▪ Focus on completing highest priority projects
▪ “Shovel ready” designs
▪ Perform enhanced facility Assessments
▪ Update long-term Asset Management Plan
▪ Complete new Long Range Financing Plan
Future

- Incorporate updated long-term look ahead for Asset Management Program
- Update Master Plan
- Monitor market trends - adjust individual project budgets as required
- Coordinate planned expenditures with new Long Range Financing Plan