Case Study
Integrating a New, 50-mgd Seawater Desalination Facility into the San Diego Regional Distribution System

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San Diego County Water Authority
San Diego County Water Authority

- Wholesale water agency created by State Legislature in 1944
  - 24 member agencies
  - 36-member board of directors
  - 3 million people
  - $188 billion economy

- Mission is to provide safe and reliable water supply to member agencies

- Service area
  - 950,000 acres
  - 97% county’s population
Seawater Desalination as a Resource Strategy to Providing Supply Reliability

- New, local water supply
- Reduces need for imported water
- Drought-proof supply
- Improved water quality
- More expensive than existing imported supplies
- Cost on par with other new, local water supplies
- Enhances regional supply reliability and local control
Carlsbad Desalination Project

Mouth of Lagoon

Intake

Outfall
Carlsbad Desalination Project
Water Purchase Agreement (WPA)

- WPA outlines commercial and financial terms for production and delivery of water
- Establishes risk transfer to private developer
- Outlines terms of potential purchase of plant by Water Authority
- Water Authority Board approved WPA on Nov 29, 2012
Poseidon Resources
General Responsibilities

- Permit, Design and Build the Desal Plant
- Permit, Design and Build the Conveyance Pipeline (design–build agreement)
- Own, operate and maintain the Desal Plant
- Supply Product Water that meets water quality requirements
Water Authority General Responsibilities

- Timely Construction of SDCWA improvements
- Own, operate and maintain SDCWA improvements
- Own, operate and maintain conveyance pipeline
- “Take or Pay” for Product Water if it meets specifications (minimum commitment of 48,000 AF/Year)
Carlsbad Desalination Project Construction is well under way

- 50 million gallon per day seawater desalination project
- Largest seawater desalination facility in western hemisphere
Carlsbad Desalination Project Delivery System

Desal Conveyance Pipeline
10-miles of new 54-inch pipe

Desalination Plant

Pipeline 3 Relining
(27,100 feet)

TOVWTP Improvements

Aqueduct Connection Facilities
Project Components

Pacific Ocean

Carlsbad

Desal WTP

Encina Power Station

New 54-inch steel pipe 10-miles

San Marcos

TOVWTP

P3 relining 5-miles

Pipeline Interconnection

Pipeline 3

Pipeline 4
Site Plan

CARLSBAD DESALINATION PLANT
SITE PLAN

LELAND RESOURCES

TETRA TECH
Carlsbad Desalination Project Delivery System

Desal Conveyance Pipeline
10-miles of new 54-inch pipe

Pipeline 3 Relining (27,100 feet)

TOVWTP Improvements

Aqueduct Connection Facilities
Desalination Conveyance Pipeline

- 10-miles of 54-inch welded steel pipeline
- Poseidon / Kiewit-Shea will be responsible for design and construction
- SDCWA will own, operate and maintain
- Built entirely within existing city streets
  - Carlsbad
  - Vista
  - San Marcos
- Traffic control measures to minimize public impacts
- Approximately 2-year construction duration
- Two construction headings working simultaneously
Pipeline Construction
Pipeline Construction
Pipeline Construction
Pipeline 3 Assessment

- Assessment of P3 for use as dedicated conveyance for desalinated water north to TOVWTP.
- In-pipe Magnetic Flux Leakage Inspection Completed
  - New technology to determine wall thickness for existing steel pipeline
  - Preliminary results indicate pipeline in overall good condition
Pipeline 3 Assessment
Pipeline 3 Assessment
Clearwell Upgrades
Chem Feed Upgrades
TWFCF Upgrades
New 54” piping
New Isolation Vault

Existing Pipeline
New pipeline and facilities
New chem feed line
### Total Project Costs (2012 dollars)

#### Total Capital Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Total desalination plant</td>
<td>$537 million</td>
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<tr>
<td>Total conveyance pipeline</td>
<td>$159 million</td>
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<tr>
<td>Water Authority improvements and oversight</td>
<td>$80 million</td>
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#### Total O&M Costs (Plant and Pipeline)

$49 – $54 million annually

#### Total Unit Cost

$2,014/acre–foot\(^1\)

\(^1\)Includes debt service, operations, Water Authority construction oversight and administrative costs
Approximately 35 months to construct, start-up and commission plant. Work began late last year.

Approximately 30 months to complete conveyance pipeline and Water Authority improvements.

On-line by late 2015.