San Diego County Water Authority

Experiences with Project Delivery Methods; Additional Information on Design/Build and Public-Private Partnership for Program Delivery

Santa Clara Valley Water District
Board of Directors Meeting
October 10, 2017

Robert Yamada
Director of Water Resources

San Diego County Water Authority

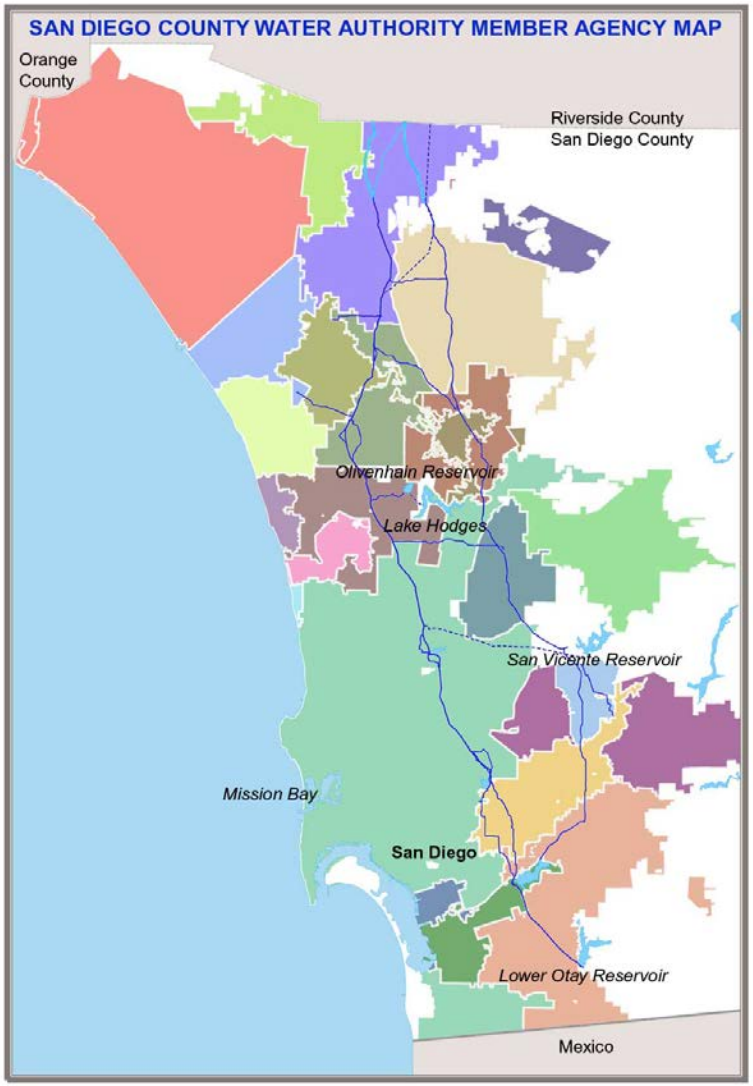
San Diego County Water Authority

Wholesale water agency created by State Legislature in 1944

- 24 member agencies
- 36-member board of directors
- Serves 3.3 million people and region's $222 billion economy

Provides 80%-90% of water used in San Diego County

- Added desalinated seawater to local supply in late 2015
- Builds, owns, operates and maintains large-scale regional water infrastructure



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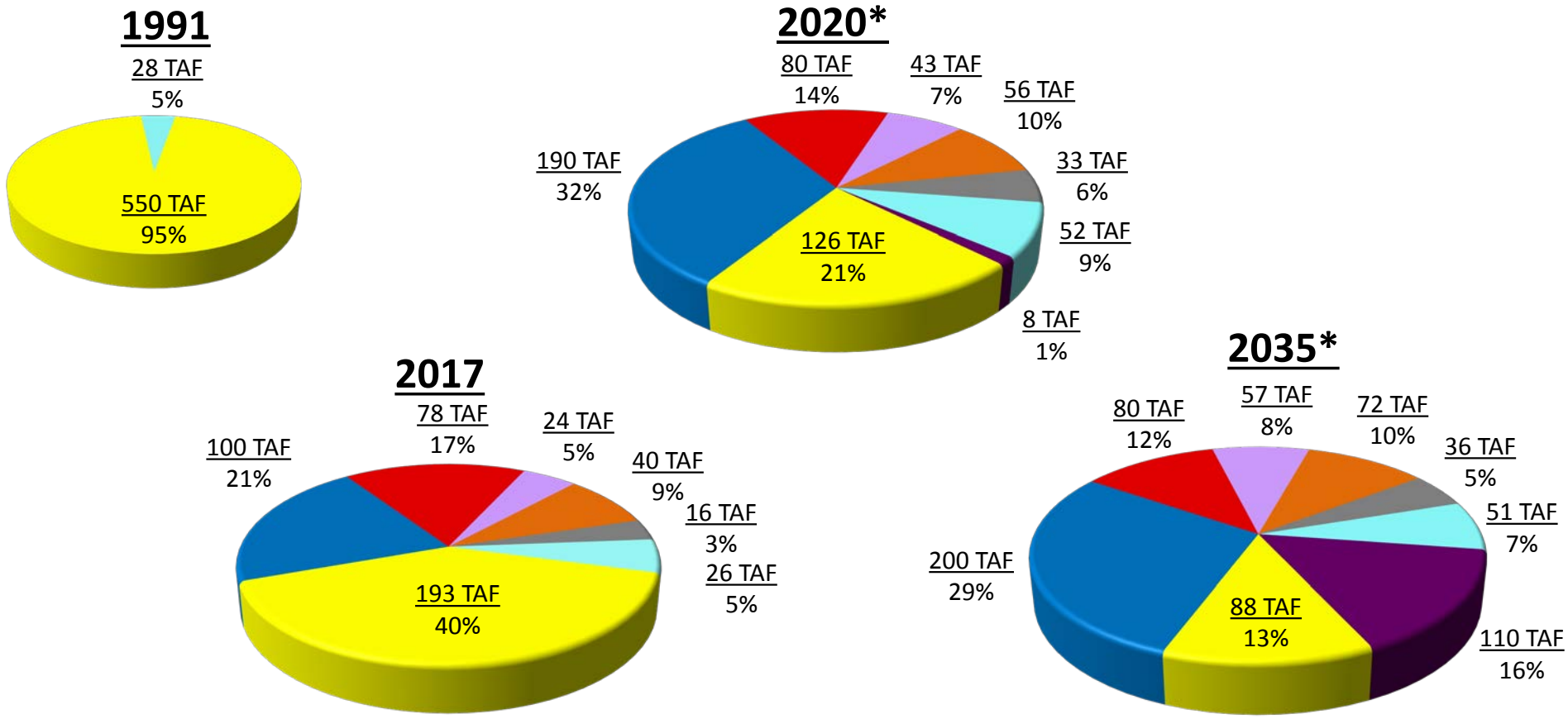
Increasing San Diego County's Water Supply Reliability through Supply Diversification



* Includes verifiable and additional planned local supply projects from 2015 UWMP

(TAF=Thousand Acre-Feet)

Water Reliability Investments

Efficient Water Use

Colorado River QSA Supplies

Carlsbad Desal Plant

Infrastructure Improvements

Member Agency Local Supply Development

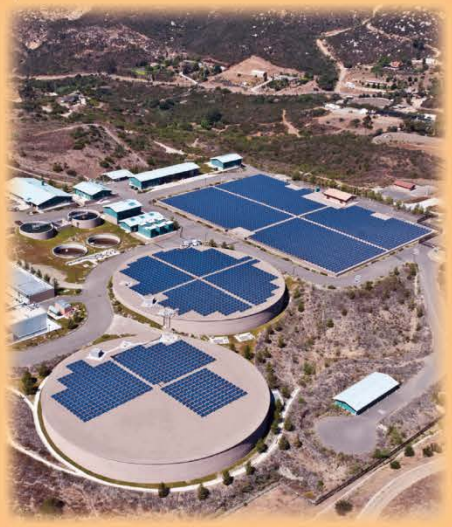
Historic Investments in Infrastructure

San Vicente Dam Raise & Related Projects
$816 million

Carlsbad Seawater Desalination Projects
$1 billion

Olivenhain Dam & Reservoir
$198 million

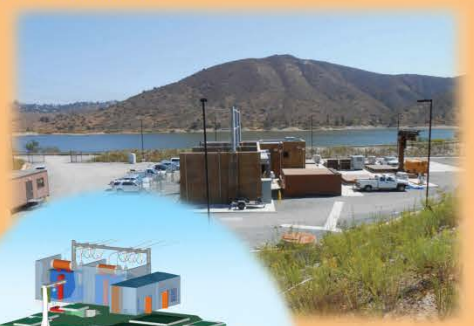
Twin Oaks Valley Water Treatment Plant
$179 million

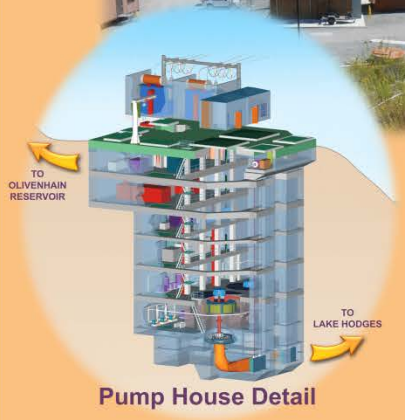


All-American & Coachella Canal Lining Projects
$447 million
($190 million from Water Authority)

Pipeline Relining
$493 million

Lake Hodges Projects
$208 million



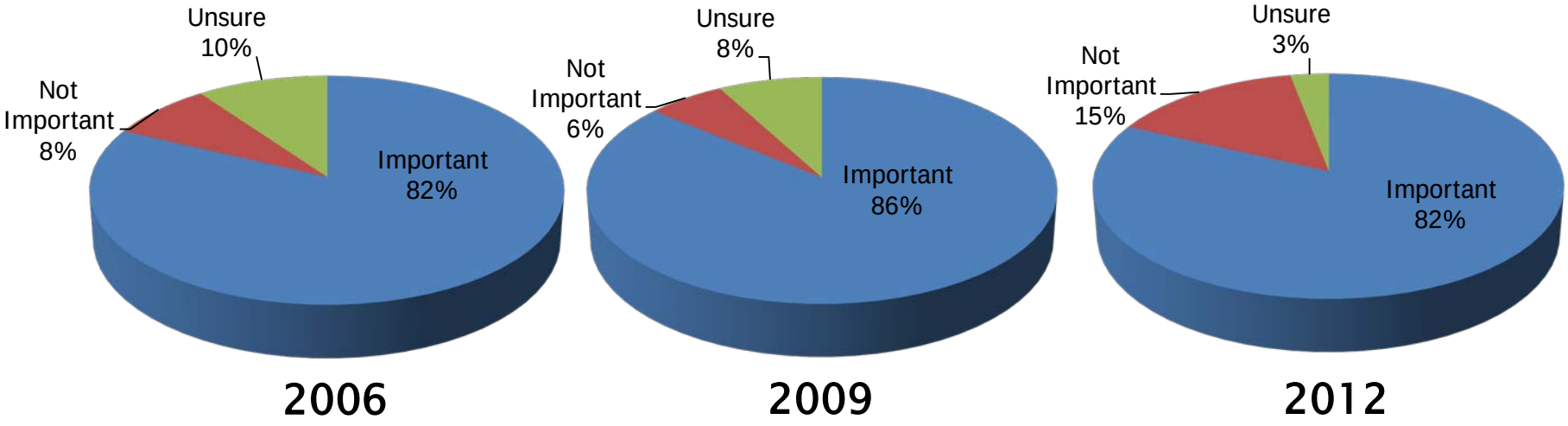


Pump House Detail

Lewis Carlsbad Desalination Plant

- Owned and operated by Poseidon Water
- 30 year contract
- $1 billion investment
- 48,000-56,000 acre-feet/year of drought-proof supplies
- Largest, most advanced seawater desalination facility in North America
- On-line in December 2015

Consistently Strong Public Support
(Water Authority Public Opinion Polls)



Importance of Ocean Desalination to San Diego County's Water Supply Reliability

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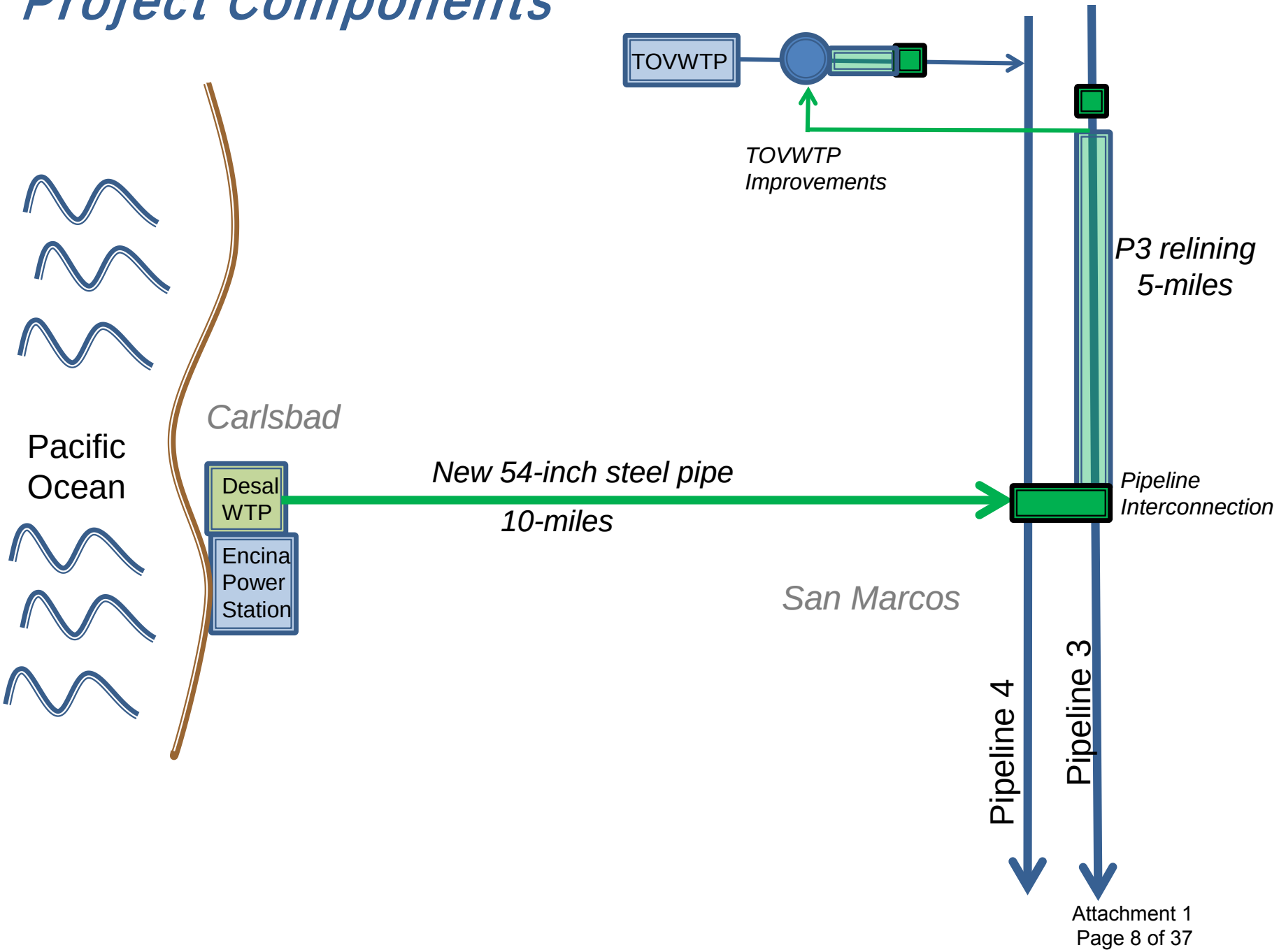
Project Components



Project Structure – Desalination Plant

- Water Purchaser
  - Water Authority is sole off-taker
  - Water Purchase Agreement
- Developer/Owner
  - Poseidon Water
- Construction/Operation of the Plant
  - WPA between Water Authority and Poseidon
  - Contractor – Kiewit/Shea Desalination
  - IDE Technologies provided process technology
  - Plant Operations and Maintenance also provided by IDE

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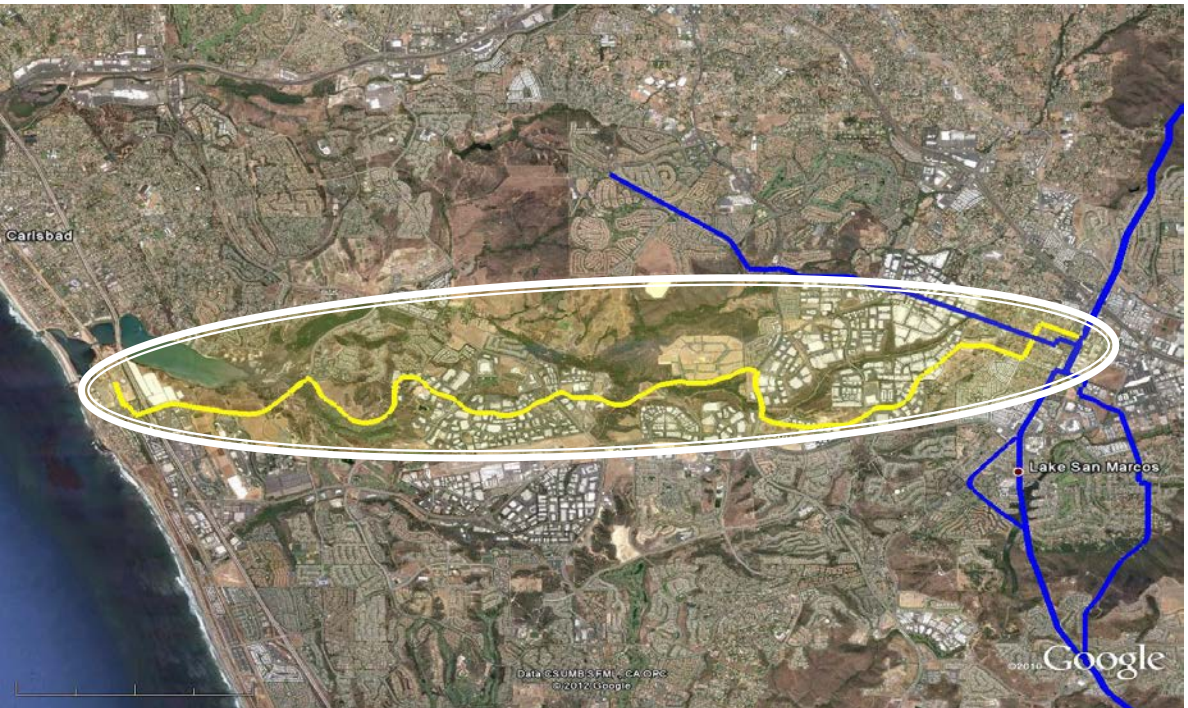
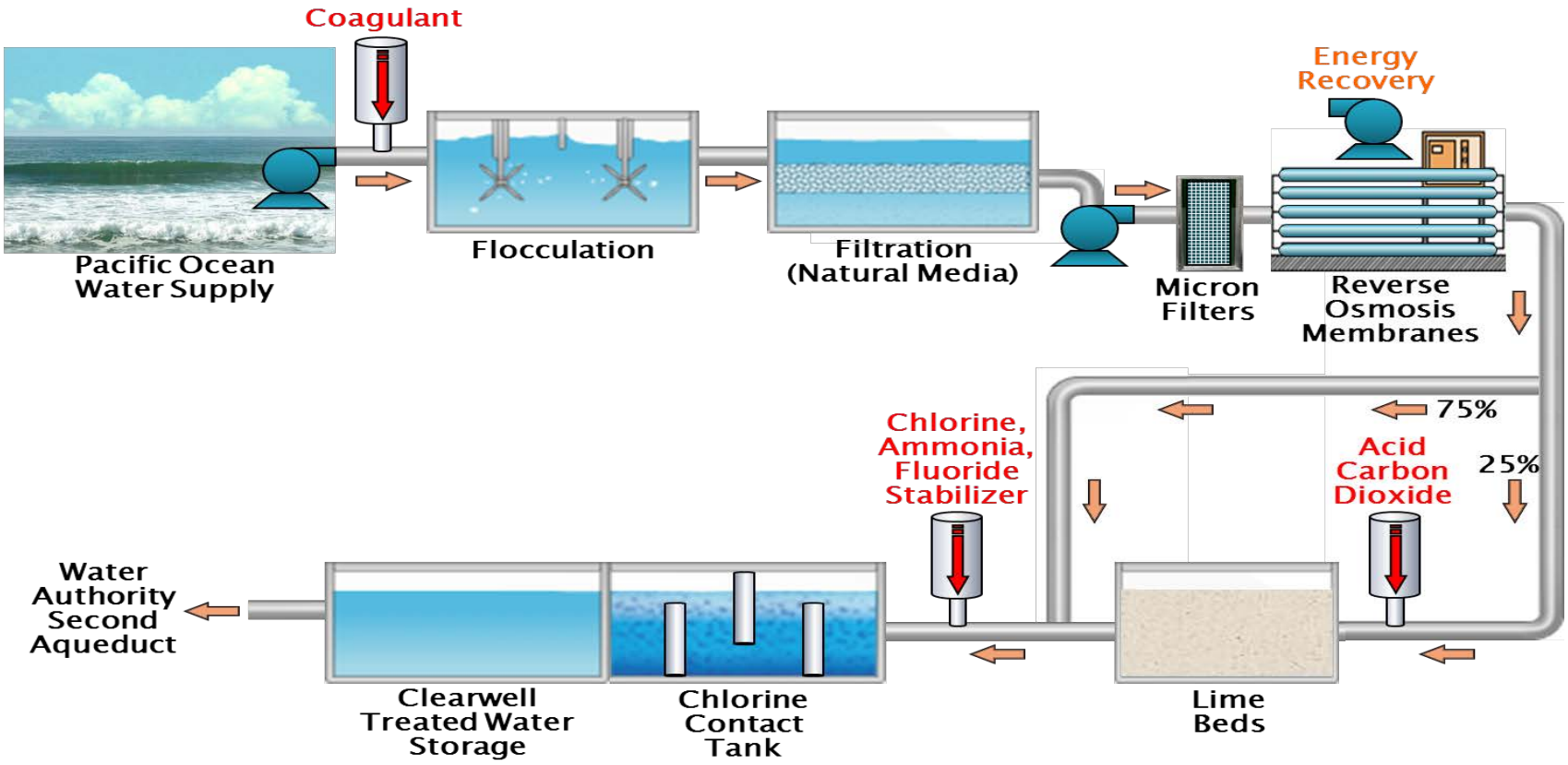
Project Structure – Conveyance Pipeline

- Owner/Operator
  - Water Authority
- Construction/Operation of Pipeline
  - Design-Build Agreement between Water Authority and Poseidon
  - Contractor – Kiewit Shea Desalination
  - Water Authority operates/maintains the pipeline



Lewis Carlsbad Desalination Plant – "How it Works"



Project Timeline

- WPA approved: November 2012
- Construction begins: December 2012
- On-line: December 2015

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Total Project Costs

Total Capital Cost

Total desalination plant	$537 million
Total conveyance pipeline	$159 million
Financing costs	$227 million
Water Authority improvements and oversight	$80 million
Total Capital Costs	**$1.003 billion**

2017/18 water purchase price* (includes pipeline)

*Current estimate based on highest electricity rate applicable

56,000 acre-feet per year	48,000 acre-feet per year
$2,202/AF	$2,439/AF

Project Financing Structure

- 82% funded through Bonds issued via the California Pollution Control Financing Authority
  - Plant Bonds issued as Tax-Exempt Private Activity Bonds with Poseidon as sponsor
  - Pipeline Bonds issued as Tax-Exempt Governmental Purpose Bonds with the Water Authority as sponsor
  - Bonds sold on December 24, 2012
  - Interest rate 4.78%
- 18% Cash Equity from Stonepeak Infrastructure

The Carlsbad Project: A Successful Public Private Partnership (P3)

- ***Risk Transfer*** to Poseidon/Contractor team
- ***Price certainty*** throughout Water Purchase Agreement term
- ***Buy-out provisions*** after 10 years of operation
- ***Transfer to public ownership*** at the end of the 30 year agreement

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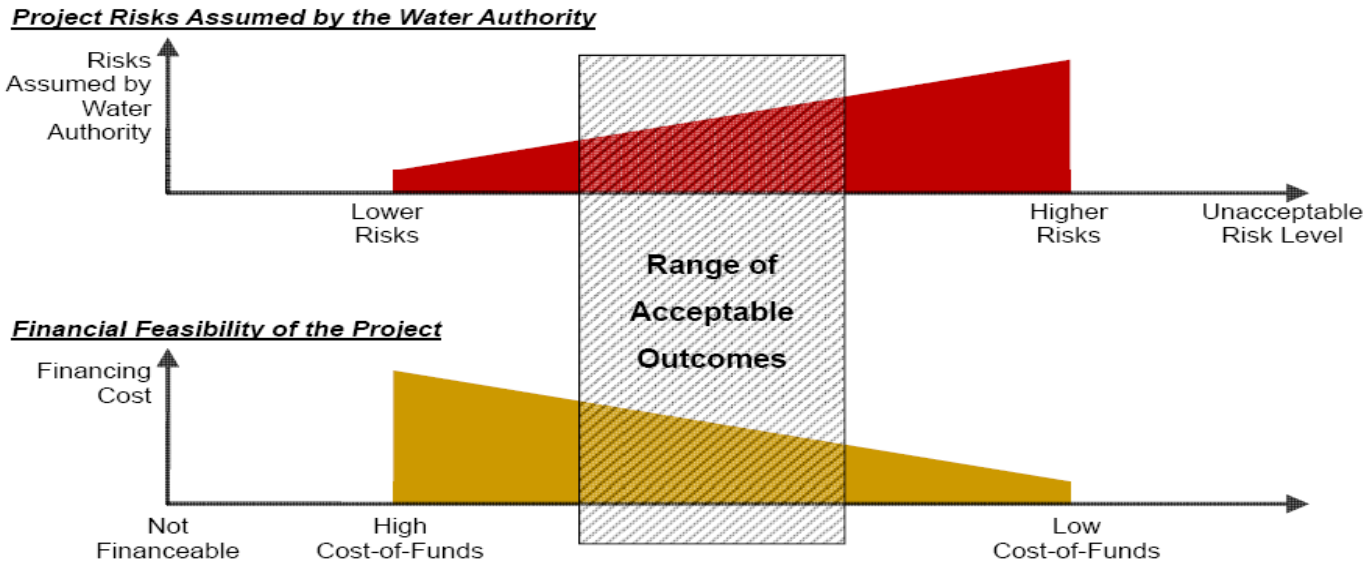
Key Objective of WPA Balancing Price and Risk

- SDCWA had never constructed or operated a seawater desalination facility
- Assign appropriate risks to private developer at minimum cost to ratepayers



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Water Purchase Payments

- Monthly, based on actual deliveries in acre-feet
- First 48,000 acre-feet per year paid at Fixed and Variable Price – "Take or Pay"
- Next 8,000 acre-feet paid at Variable Unit Price
- If Poseidon does not deliver, Water Authority does not pay

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Price Increases Under WPA

- Unit costs set and can only increase consistent with WPA provisions
- Annual operating cost increases generally tied to rate of inflation
- Price may also increase due to unanticipated changes in law or regulations
  - Changes generally apply industry-wide
  - Cannot exceed 10% in single-year or maximum 30% increase over 30-year term

Performance Guarantees

- Product Water Quality Guarantee
  - Compliance with all federal and state drinking water regulations
  - Additional standards for certain water quality parameters
- Minimum Product Water Delivery Guarantee
  - Annual supply to meet SDCWA demands (between 48,000 and 56,000 AF)
- Water Ordering Rights
  - Water Authority has rights to adjust delivery orders to reflect seasonal and daily demand changes

Project Risk Allocation

Risk Description	Poseidon & Investors	Water Authority
Construction Risk – that facility is not completed on time, on cost and according to design standards	X	
Permitting Risk – that current permit and environmental mitigation requirements increase	X	
Change in Law Risk – that future unanticipated laws or regulations increase operating costs	X	X
Technology Risk – that the plant technology does not perform as expected	X	
Output Risk – that the plant produces less than the projected volume of water	X	
Operating Margin Risk – that the price of water is not adequate to generate enough revenue to pay expenditures or may increase more than projected	X (Budget Cap)	X (Subject to CPI)
Pipeline Operating Risk – the Pipeline connecting the Plant to the regional aqueduct system and appurtenant facilities transport acceptable water to Water Authority wholesale customers	X	X
Electricity – the cost of electricity is accounted for in the water price	X (Electricity Consumption)	X (Electricity Price)

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Risks Transferred

- Construction and Operating Cost Overruns
- Timely Project Completion
- Regulatory and Law Compliance
- Regulated or Differing Site Conditions
- Capital Maintenance, Repair and Replacement
- Labor Supply and Relations

Risks Retained by Water Authority

- Changes in Law that affect all desalination plant operators or wastewater dischargers
- Cost of Intake Modifications due to expected power station closure *(also a change in law)*
  - Closure-related capital costs capped at $21.3million (indexed)
  - Closure-related operating costs capped at $2.7 million
- Uninsurable Force Majeure Events
- Unusual Raw Seawater Water Parameters (no additional compensation)
- Retained risks are “uncontrollable circumstances”

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2016/2017 Contract Year Operations

- 40,400 Acre-feet delivered in first full contract year (9% of the region's supply)
- Delivery shortfalls occurred due primarily to source water challenges
  - Algal bloom, rapid temperature changes
  - Example of risk transfer

Normal intake conditions

April 2017 – intake conditions during extreme algae bloom

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2016/2017 Contract Year Operations

- Poseidon implementing measures to address:
  - Membrane cleaning/replacement
  - Real-time algae monitoring
  - Treatment system improvements to enhance algae removal
  - Working with regulators to address minor salinity fluctuations due to temperature changes

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Status of Plant Operations

- Began commercial operations on December 23, 2015
- Over 23 billion gallons of desalinated ocean water produced to date
- Permitting and procurement under way for planned intake and discharge modifications

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P3 Delivery Pros and Cons

- Pros:
  - Risk transfer to the private sector
  - Speed (design and construction can proceed concurrently)
  - A commodity purchase with defined terms and conditions
  - Performance guarantees
  - Approval rights over acceptance/performance testing
  - Debt is kept off the public agency balance sheet

- Cons:
  - Take or Pay contract
  - Higher cost of capital
  - Greater overall transactional complexity
  - Limited public agency input regarding design, construction and operations
  - Public agency does not have a direct relationship with contractors

Design – Build – Operate Twin Oaks Valley Water Treatment Plant

San Diego County Water Authority

Twin Oaks Valley WTP

- 100 mgd submerged membrane WTP, ozone and biologically active carbon contactors
- Solids handling facilities, water control facilities, emergency power generators
- Environmentally-friendly project
- 15 years of O&M, with 5-year optional extension
- Fixed Design-Build Price = $157M
- Annual Service Fee = $7 million (2017)

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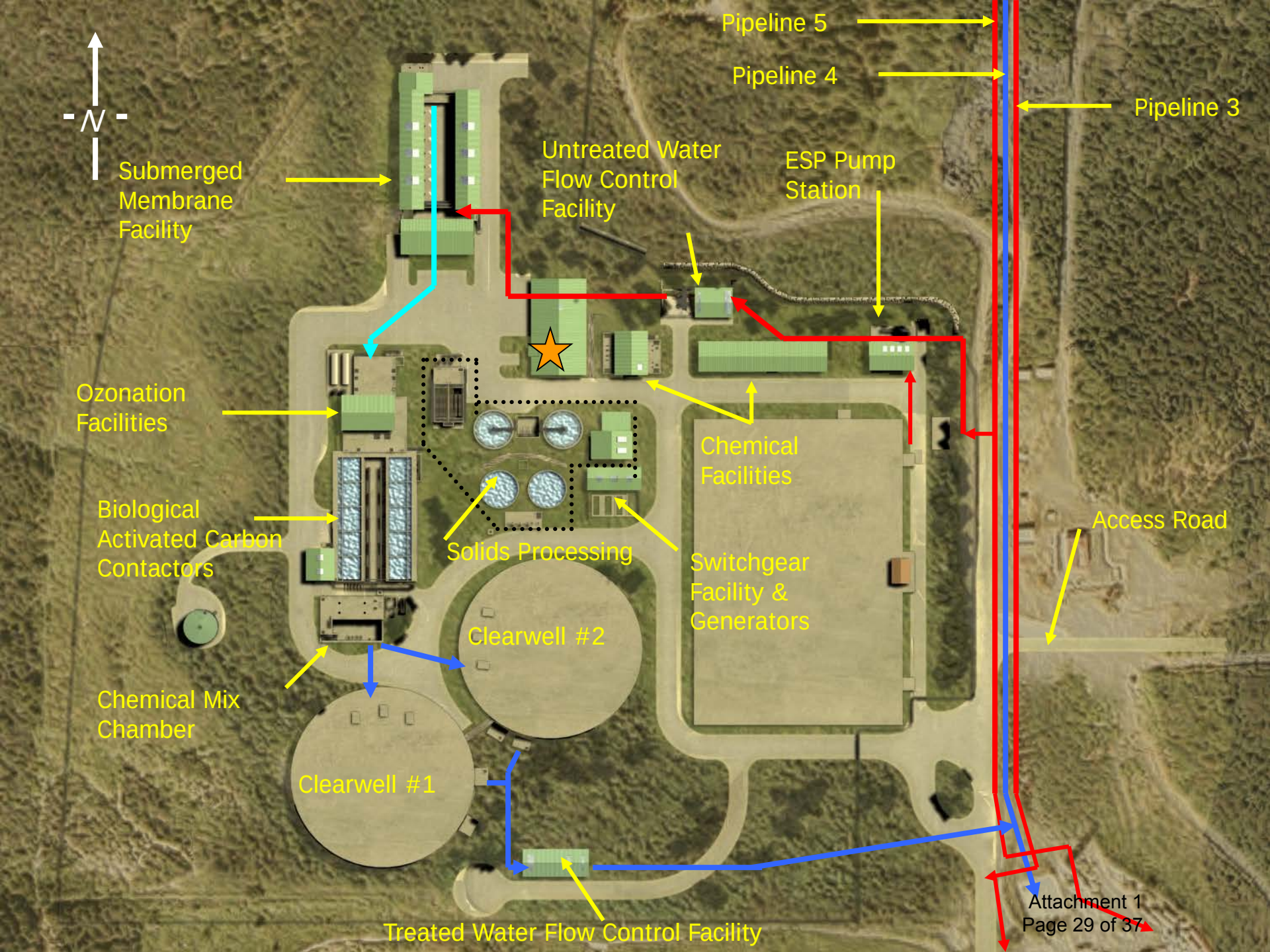
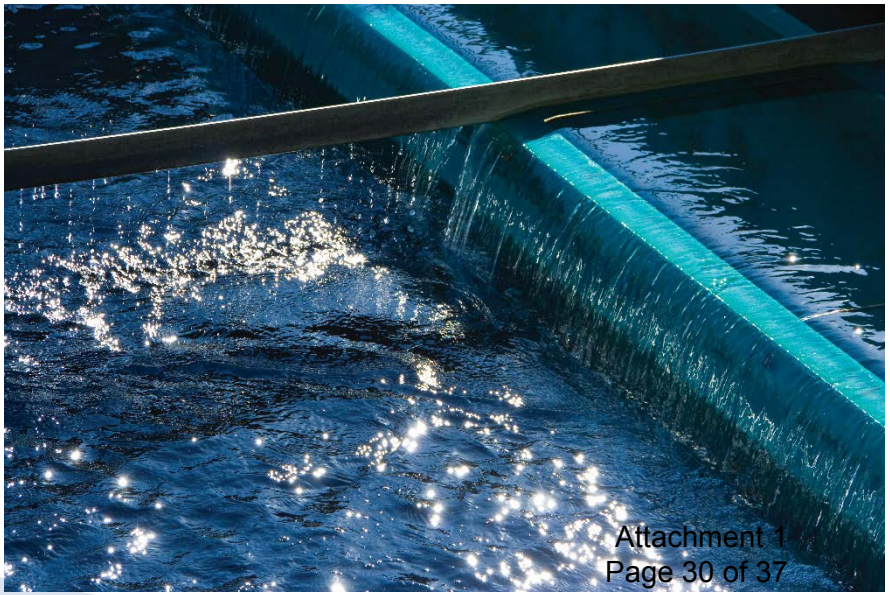

N
Pipeline 5
Pipeline 4
Pipeline 3
Submerged Membrane Facility
Untreated Water Flow Control Facility
ESP Pump Station
Ozonation Facilities
Chemical Facilities
Biological Activated Carbon Contactors
Solids Processing
Switchgear Facility & Generators
Access Road
Clearwell #2
Chemical Mix Chamber
Clearwell #1
Treated Water Flow Control Facility

Why Design-Build-Operate?

- Primary reason
  - Schedule
- Secondary reason
  - Water Authority Engineering and O&M Experience is in Conveyance Facilities not Treatment



Key Strategy: Use of Knowledgeable Advisors

- Owners Representative
  - DBO Solicitation and Award
  - Conceptual Designs and support
  - Management of DBO Contract
- Board of Senior Consultants
  - Experienced public sector owners
  - Industry experts
  - DBO procurement experts
- DBO attorney

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Project Timeline

- RFQ to contract award: June 2004–Sept. 2005
- Execute contract: October 2005
- Begin Construction: February 2006
- On-line: June 2008

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Risks Transferred

- Construction and Operating Cost Overruns
- Timely Project Completion
- Capital Maintenance, Repair and Replacement
- Labor Supply, Costs and Relations
- Water quality
- Cost of chemicals

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Risks Retained

- EIR and Securing land
- Differing Site Conditions
- Raw water characteristics
- Changes in Law or Regulatory changes
- Power Consumption (Shared)

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Status of Plant Operations

- Began commercial operations on June 13, 2008
- Over 545,000 acre-feet of treated water produced to date
- Currently evaluating upgrades to “zero discharge” treatment systems

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DBO Delivery Pros and Cons

- Pros:
  - Integration of designer/contractor/operator
  - Facilitates Use of Industry Expertise
  - Cost and schedule savings over DBB

- Cons:
  - Owner responsibility for capital costs – no risk transfer
  - Any debt goes on owner balance sheet
  - Contractor performance of asset mgmt. on publicly-owned asset
  - Operating cost risk transfer may be less clear than P3

Questions?

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