June 25, 2026

Agenda Item: 7, Presentation
Meeting Date: June 25, 2026

Antioch Brackish Water Desalination Plant

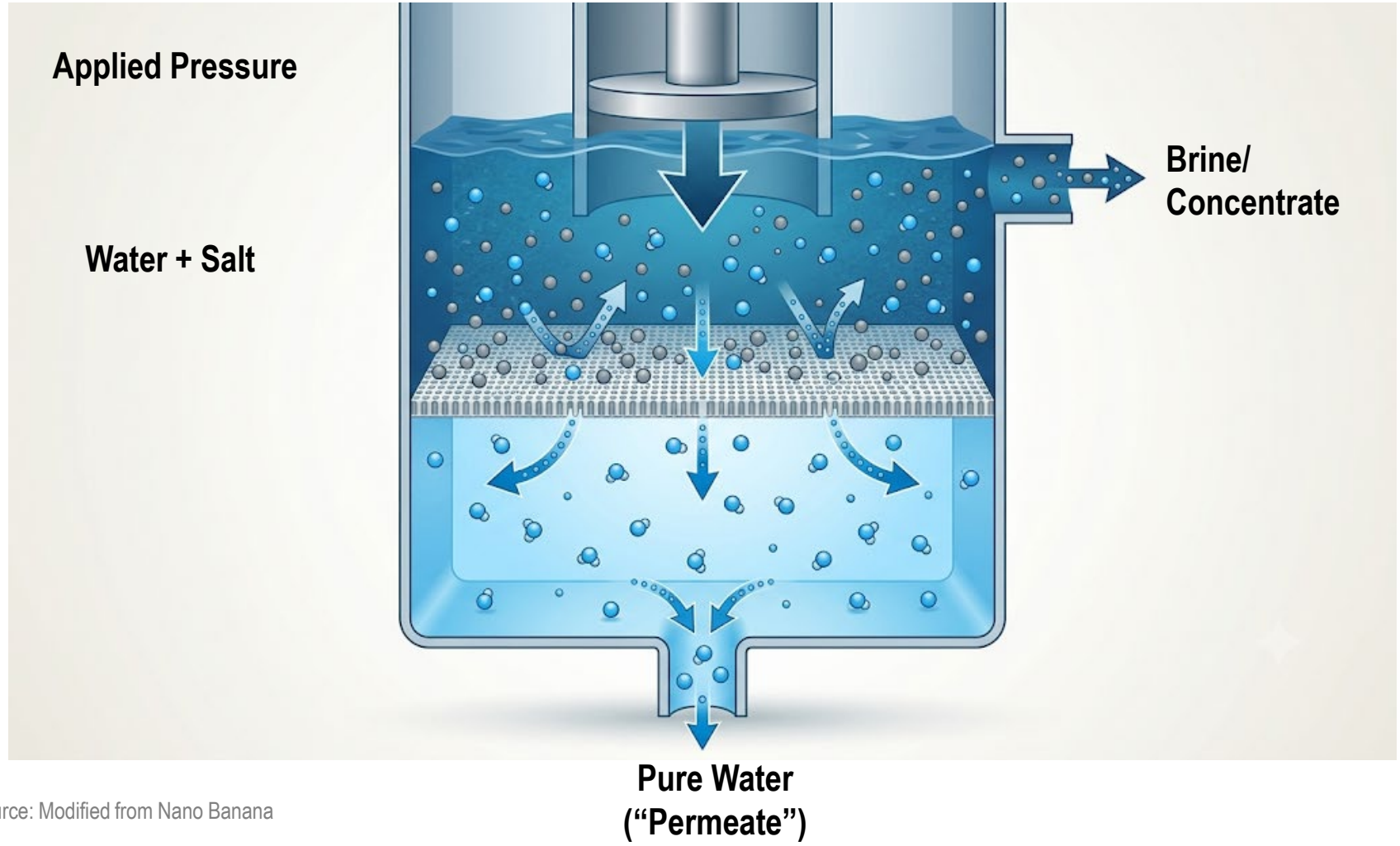
Delta Stewardship Council

A CALIFORNIA STATE AGENCY

CALIFORNIA'S Sacramento-San Joaquin Delta

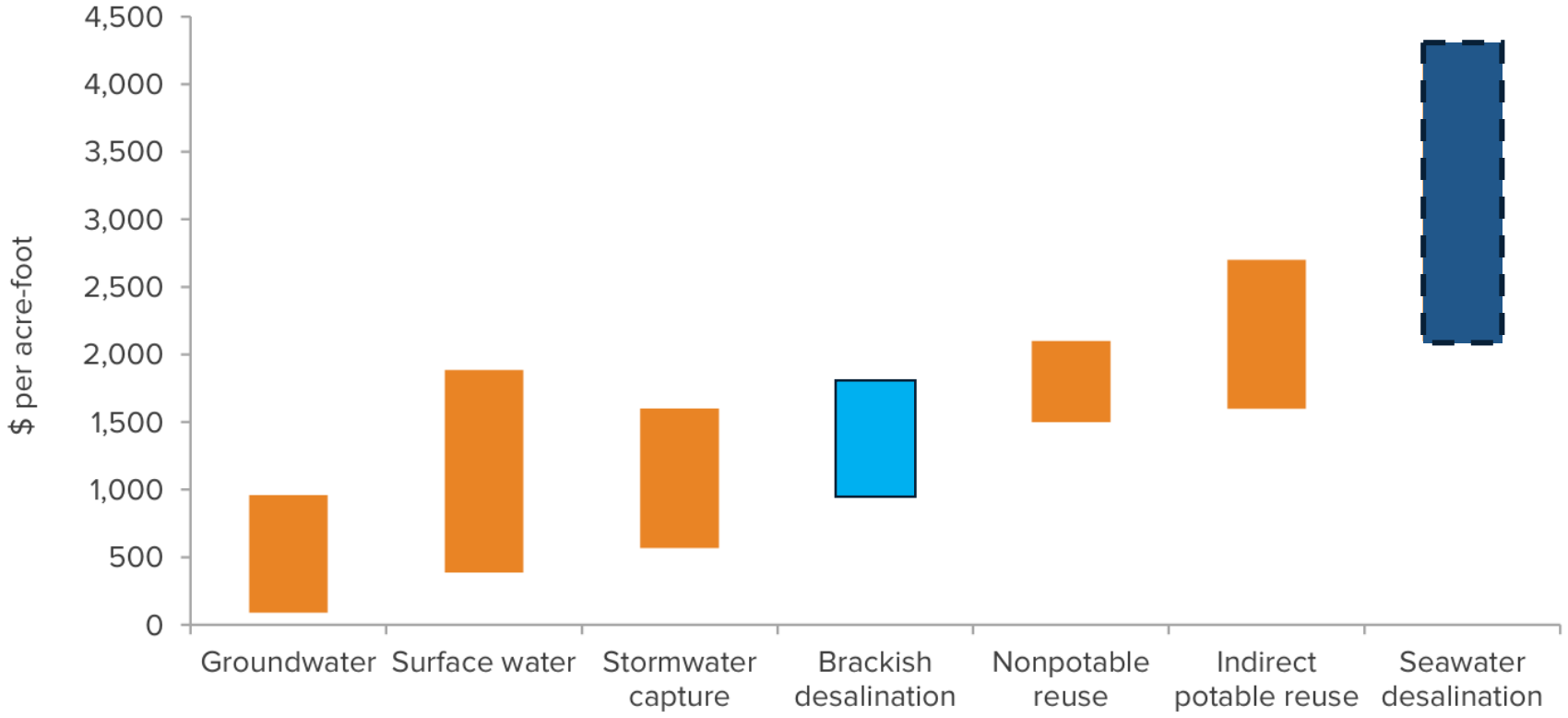
- **Located inland from the San Francisco Bay** at the convergence of the Sacramento and San Joaquin Rivers
- **Spans five counties in Northern California:** Contra Costa, Sacramento, San Joaquin, Solano, and Yolo
- **Supplies a portion of the drinking water** for 27+ million Californians
- **Contributes billions in agricultural products** toward the State's economy, the fourth-largest in the world
- **Provides 750+ plant and animal species with critical habitat** along its thousands of miles of meandering waterways
- **Home to nearly 600,000+ people** spread across rural agricultural, legacy, and urban communities
- **California's first National Heritage Area,** as designated by the U.S. Congress


Source: DWR 2025



Source: Modified from Nano Banana

Alternative supplies generally cost more than new surface and groundwater sources



Modified from: *PPIC Factsheet: Alternative Water Supplies in California. Henry McCann, Alvar Escriva-Bou, and Kurt Schwabe. February 2018.*

City of Antioch
Brackish Water Desalination Project

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Agenda

- Project Background
- Design and Construction

PROJECT BACKGROUND

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Project Background

- City has two sources of drinking water:
  - San Joaquin River
    - Pre-1914 appropriative rights
  - Contra Costa Water District (CCWD)
- Water Supply Reliability Challenges:
  - Increasing salinity intrusion from SF Bay limits ability to divert river water and fully utilize pre-1914 water right
  - Further salinity increases anticipated due to sea level rise, reduced freshwater flow through the Delta, and impacts of future Delta water management projects
  - More frequent droughts and other climate change impacts

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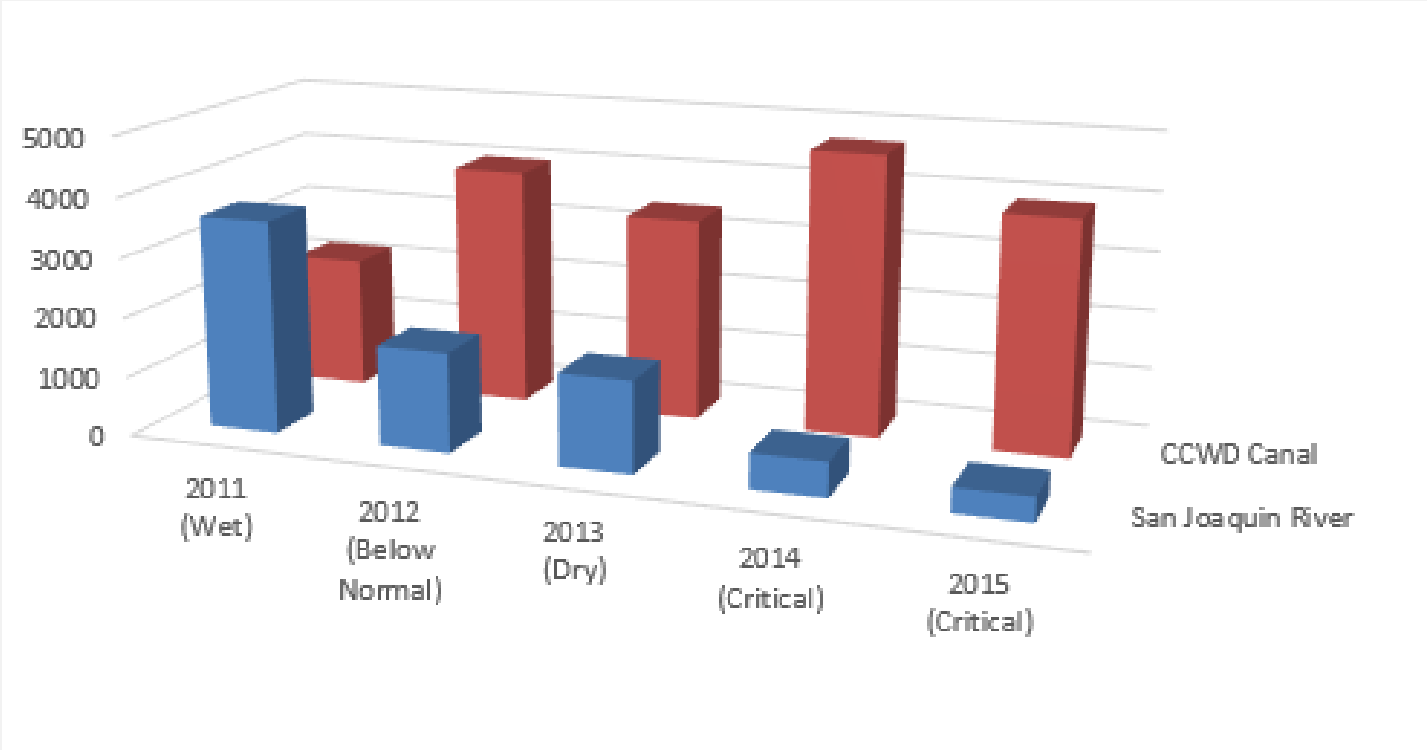
City's River diversions declined each year during the last drought



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Brackish Water Desalination Project provides reliable, drought-proof water supply

- Heart of project is a new reverse osmosis (RO) membrane facility to desalinate river water
- Produces 6 million gallons per day (MGD) of drinking water
- Use when river salinity is too high for conventional treatment
- Alternatives considered include increasing existing raw water storage, reclaimed water, and conservation

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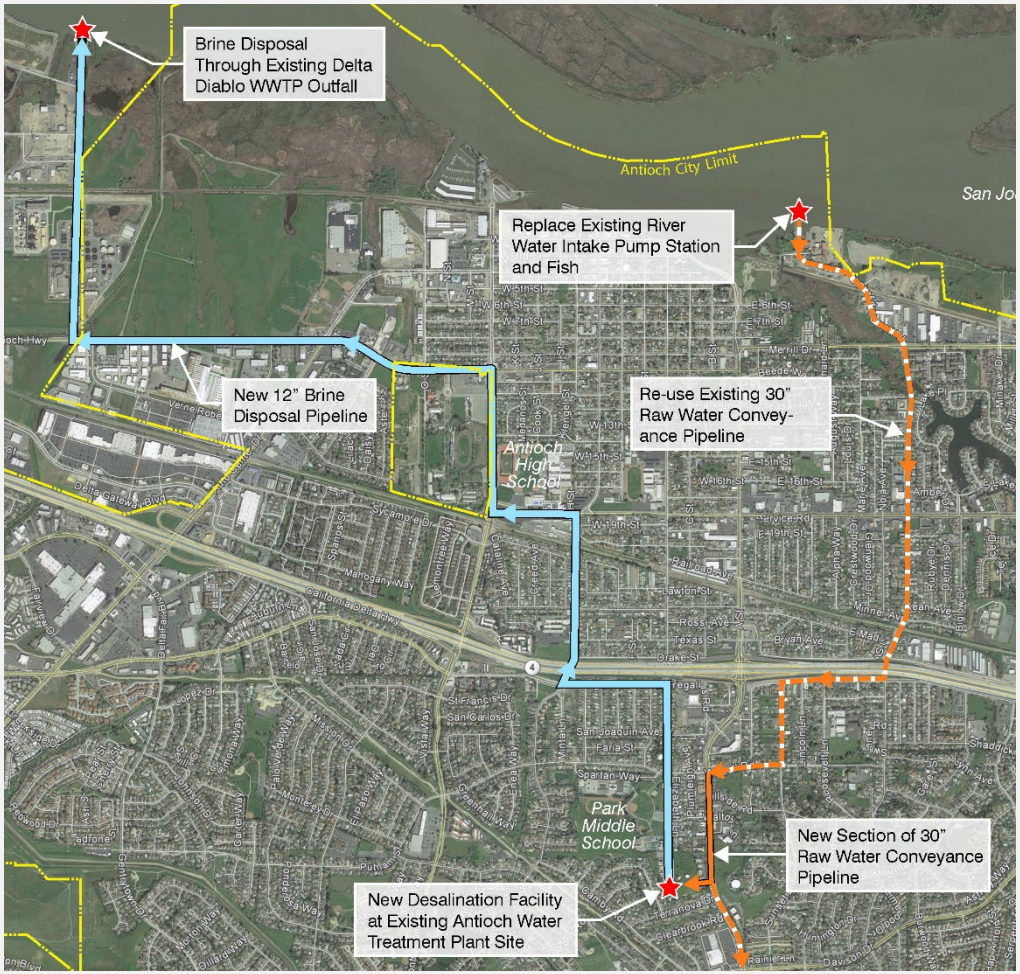
Project Makes Cost-Effective Use of Existing Facilities



Key Project Elements:

- New river intake fish screens
- New river intake pump station and fish screens
- Upgrades to City's existing Water Treatment Plant
- New reverse osmosis membrane facility
- New brine disposal pipeline to Delta Diablo Wastewater Treatment Plant outfall

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Major Environmental Permits

- Environmental Impact Report (October 2018)
- RWQCB NPDES permit for brine disposal at Delta Diablo Wastewater Treatment Plant (December 2019)
- RWQCB 401 Water Quality Certification (April 2020)
- **Delta Plan Consistency Certification (May 2020)**
- NMFS and USFWS Biological opinions (July 2020)
- CDFW Streambed Alteration Agreement (July 2020)
- CDFW Incidental Take Permit (July 2020)
- USACE 404 Nationwide Wetlands Permit (July 2020)

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Financing

- Capital Costs $120M
  - Planning, Design, Permits, Construction, CM, Administration
- Loans
  - $1M SWRCB State Revolving Fund (SRF) loan for planning activities
  - $60M SRF loan for design and construction
- Grants
  - $10M DWR Prop 1 Desalination Grant
  - $27M DWR settlement agreement
- City Financed
  - Remaining Funding from Enterprise Fund

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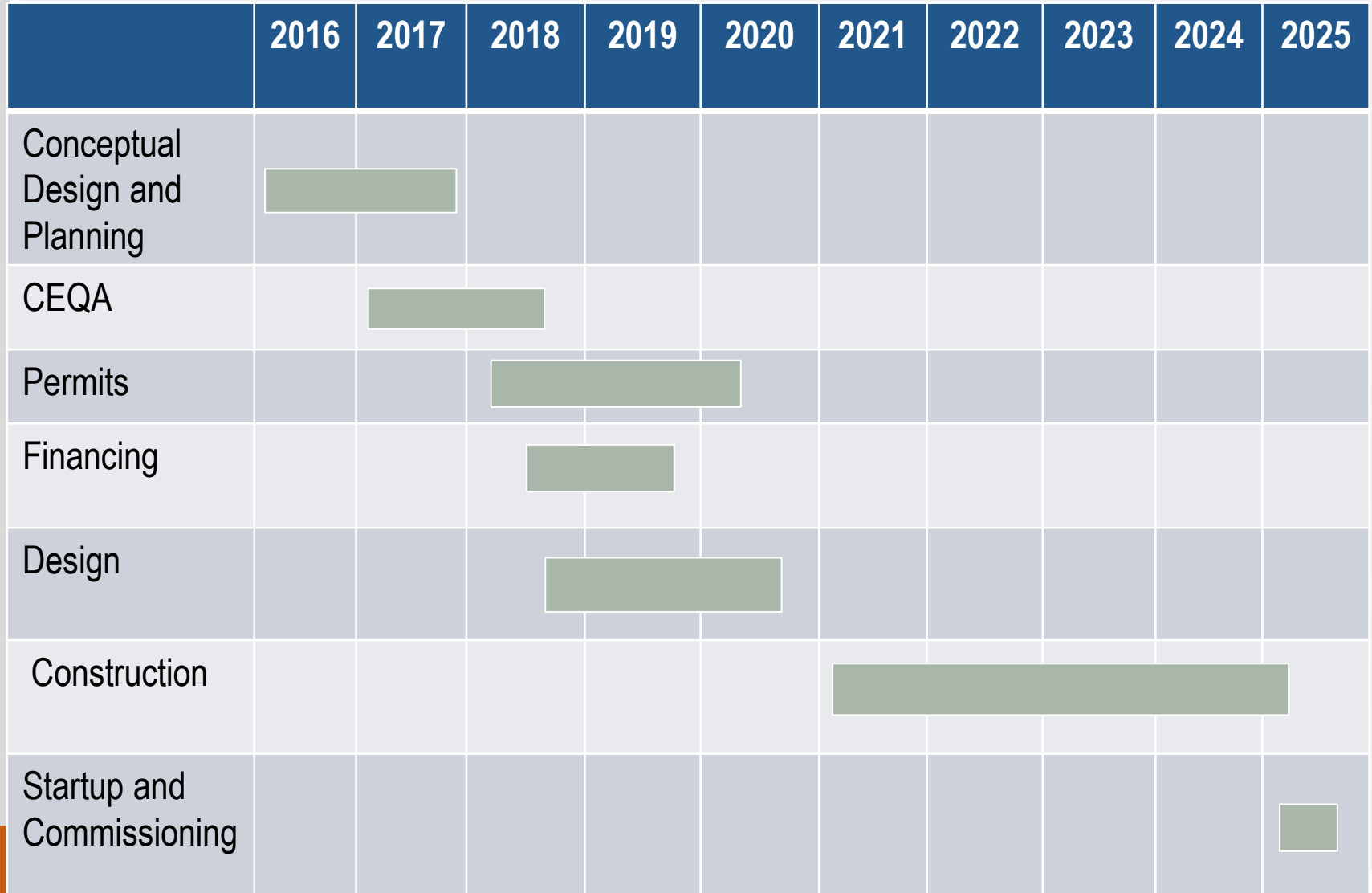
Project Schedule



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DESIGN and CONSTRUCTION

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River Intake Facilities

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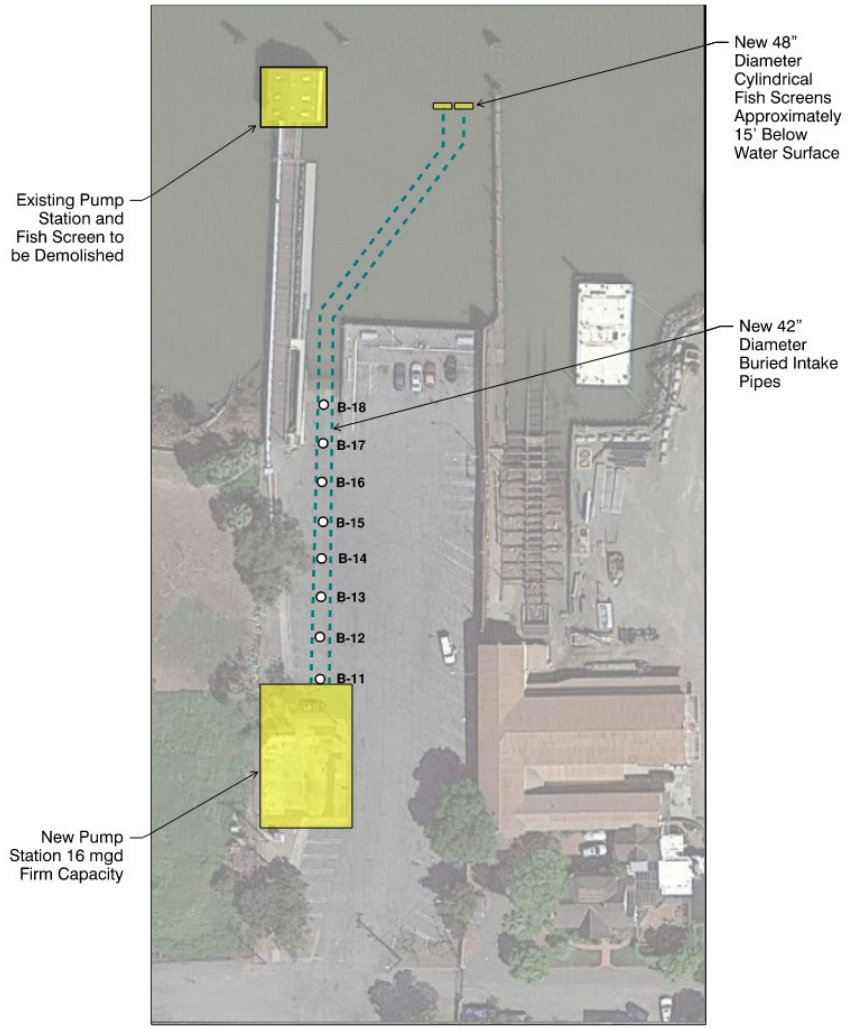
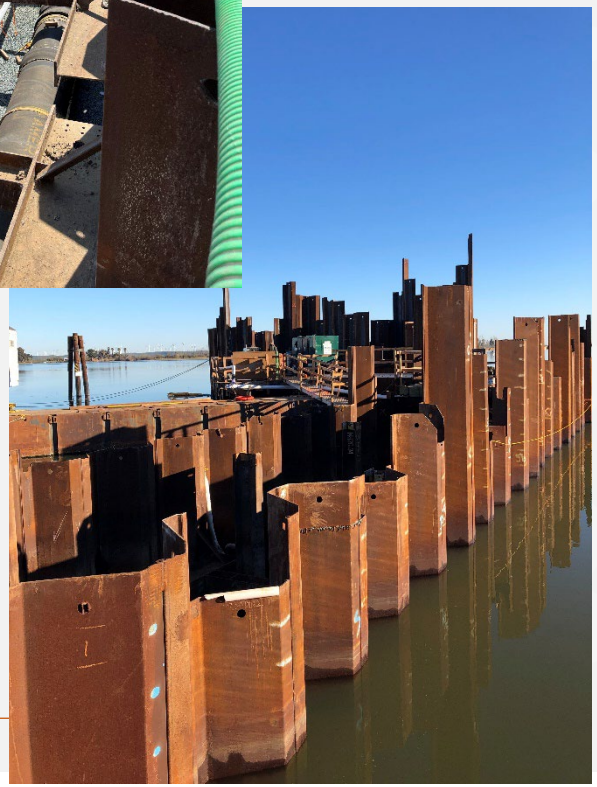
River Intake Facilities





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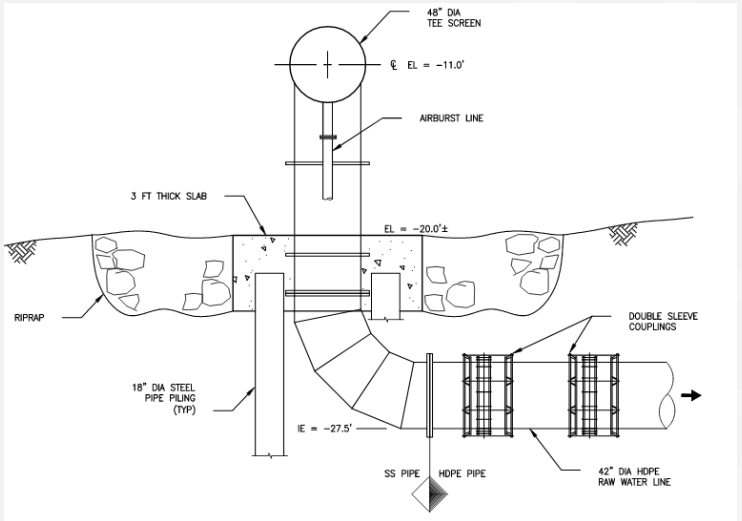
Intake Fish Screens

- 316 stainless steel Tee screens
- 16 mgd capacity each (redundant)
- Air burst cleaning
- Meets design criteria for Delta Smelt protection



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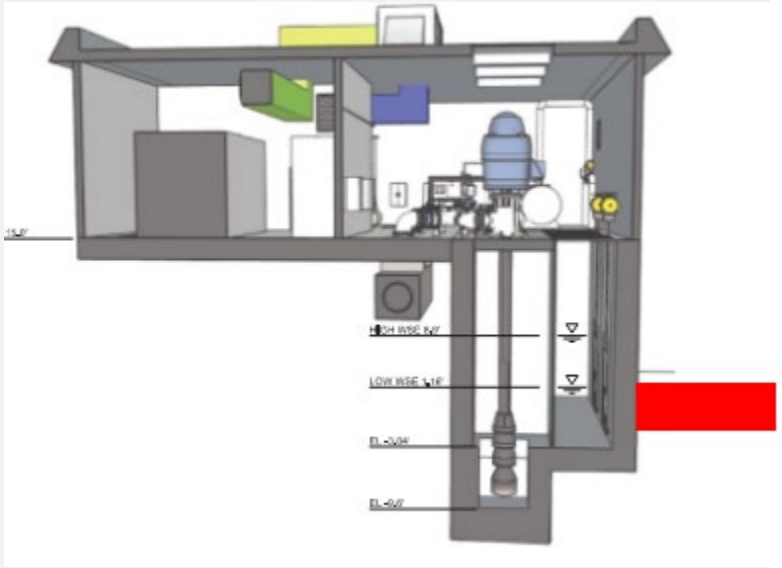
River Pump Station

- 8 mgd vertical turbine pumps (2 duty, 1 standby)
- Variable frequency drives
- 600 horsepower (HP) each
- New building houses pumps, fish screen compressor, power and control



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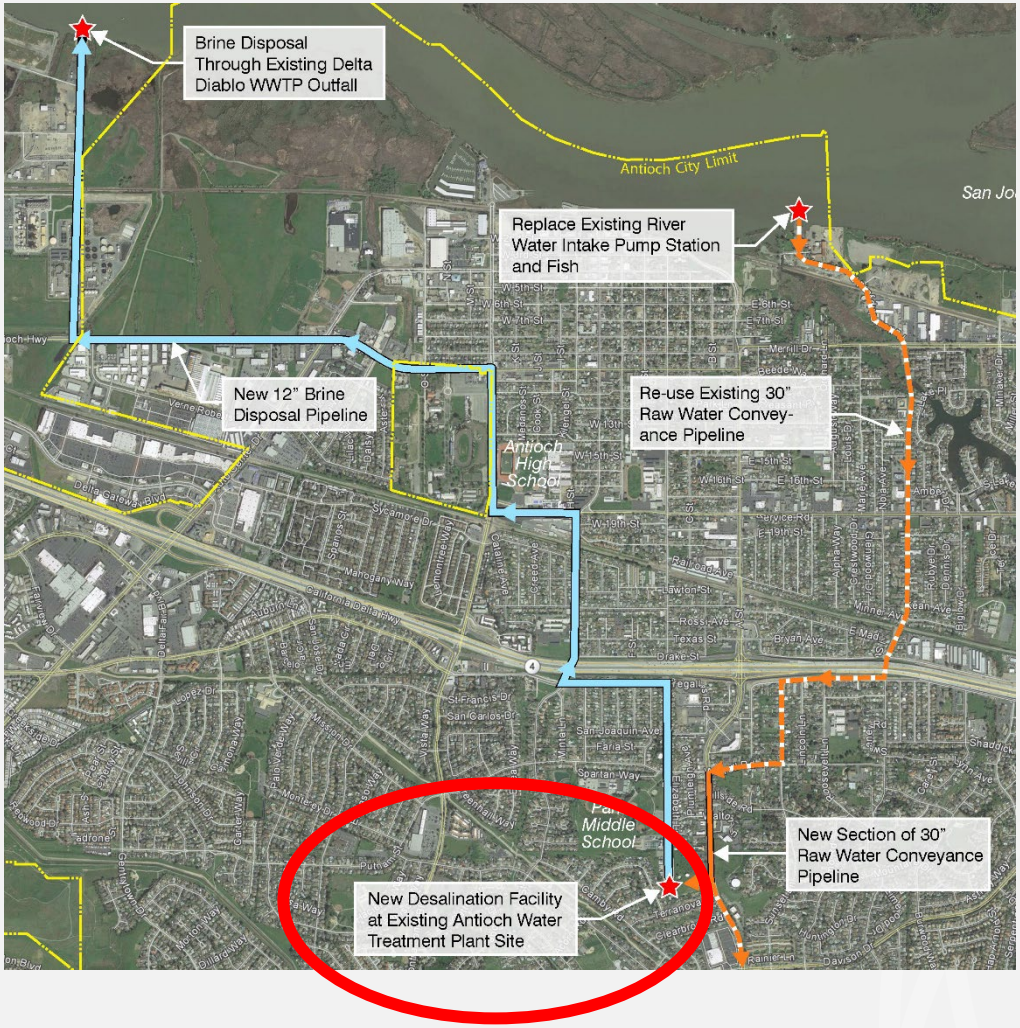
Desalination Facilities at Antioch WTP



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Desalination Facility

- Four RO membrane skids
- Produces 6 mgd of desalinated water (permeate)
  - Requires 8 mgd of brackish water feed into the RO skids to produce 6 mgd of permeate (75% recovery)
- Salinity is 75% less than purchased water from CCWD during summer months

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Conclusions

- The City's objectives for the project were met:
  - Provide drought-proof water supply reliability now and into the future
  - Minimize reliance and save costs for purchased water
  - Improve water quality for City customers
  - Improve river intake facilities to minimize impacts to fish
  - Preserve pre-1914 water rights