

# Chapter Meeting

May 17, 2023

East County AWP

Thank you to our sponsor!



# Agenda

- Welcome to East County AWP
- Chapter Updates
  - Funding Update
  - Upcoming Events
  - GSDSEF Winners
- Sponsor Highlight
- East County AWP Presentation
- San Diego Pure Water Presentation
- Tour of AWP Construction Site

# Welcome to East County AWP



# Chapter Updates

WaterReuse San Diego Officers

# Funding Update



- ❖ USBR Desalination and Water Purification Research Program, due June 20, 2023
- ❖ Anticipate:
  - USBR WaterSMART Large Scale Recycled Water solicitation out soon
  - USBR Title VXI Recycled Water & Desalination solicitations out in early summer
  - OPR Integrated Climate Adaptation & Resilience Program solicitation out soon

# Upcoming Events

## **2023 WaterReuse California**

- November 5-7, 2023 in Indian Wells, CA
- Abstracts due July 28, 2023

## **Water for People Jazz on Tap**

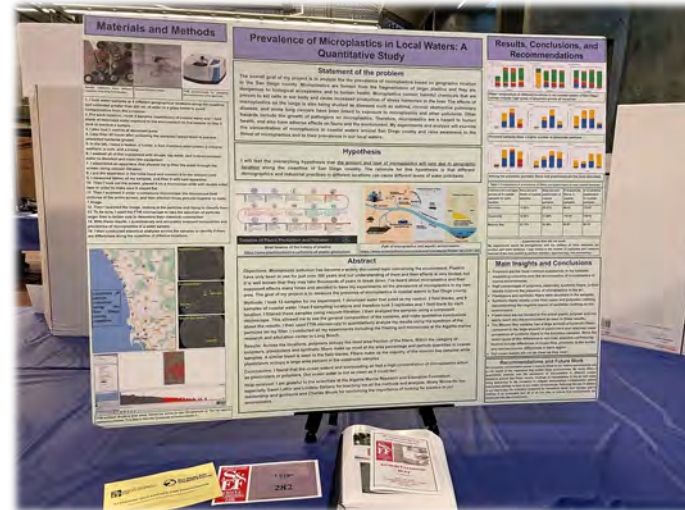
- Saturday June 24<sup>th</sup>, 2023
- 3-10 pm at Quartyard in Downtown San Diego



# Greater San Diego Science & Engineering Fair Winners



Thanks to our volunteer judges!



- 8 winners
- 4 Senior category
- 4 Junior category
- Each received \$100 scholarship from WateReuse

# Greater San Diego Science & Engineering Fair Winners

**Ryan Richardson**

“Conserving Water Using an Automatic Faucet”

**Patrick Kozak**

“Are The Homeless Encampments Along Rose Creek Polluting Its Water?”



# Sponsor Highlight

Carollo Engineers



Jeff Weishar  
JWeishar@carollo.com

# Carollo's WaterReuse Partner Projects:

// Carollo would like to recognize and thank all of our regional partner clients in supporting water reuse in San Diego:

- City of San Diego
- County of San Diego
- City of Oceanside
- City of Carlsbad
- City of Vista
- Fallbrook PUD
- Santa Fe Irrigation District
- Padre Dam Municipal Water District
- Encina Wastewater Authority
- San Elijo Joint Powers Authority
- Olivenhain Municipal Water District
- Otay Water District

// Carollo's Reuse Project Highlights:



## City of San Diego Pure Water Phase 1 North City Pure Water Facility Final Design

- Will reduce imported water by 35%
- 34 mgd Advanced Water Treatment Facility
- \$356M construction bid price
- Completion by 2027



## East County Advanced Water Purification Project Owner's Advisor and Construction Manager

- Will produce 30% East County water supply
- 16 mgd Water Recycling/Solids Handling Facilities
- 11.5 mgd Advanced Water Purification Facility
- 35 miles of new pipelines
- 24 mgd pump station upgrades

# East County AWP

Seval Sen, Advanced Water Purification Engineering Manager  
Mark Niemiec, Director of Advanced Water Purification



**East County  
Advanced Water  
Purification**

WaterReuse San Diego Chapter Meeting  
May 17, 2023



# EAST COUNTY ADVANCED WATER PURIFICATION



**Create**  
a **NEW, LOCAL,**  
Sustainable + Drought-proof  
drinking water **SUPPLY**



**Eliminate**  
**15 million** gallons/day of wastewater  
**DISCHARGE** into the  
**Pacific Ocean**

**BUILDING  
OUR  
WATER  
FUTURE**



**Reduce**  
the region's  
**DEPENDENCE**  
on imported water

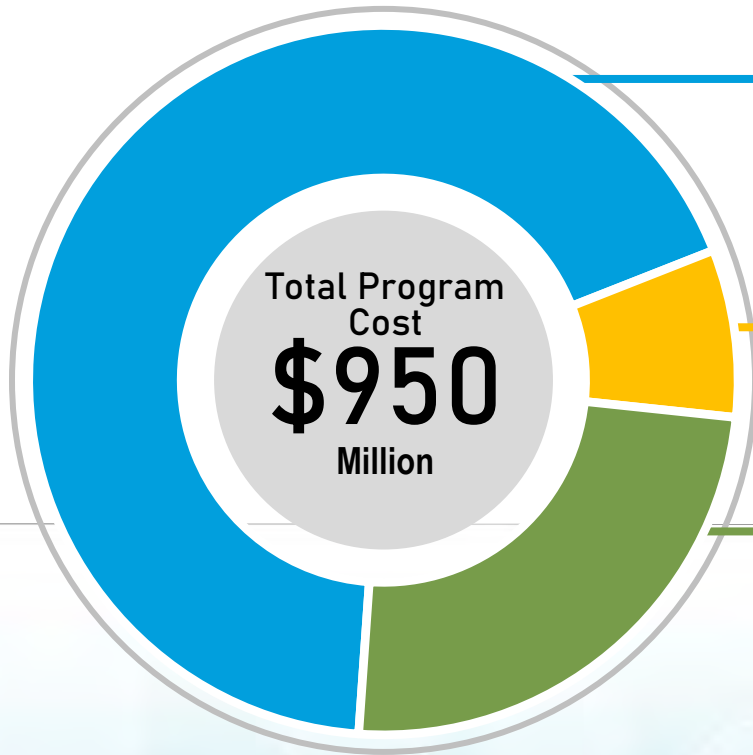


**Provide**  
up to **30%** of  
East County's  
**DRINKING WATER** demand

# GOVERNANCE STRUCTURE



# PROGRAM COST UP TO COMMERCIAL OPERATIONS



**\$644 M**

- Design & Construction



**\$72 M**

- Financing & Reserves

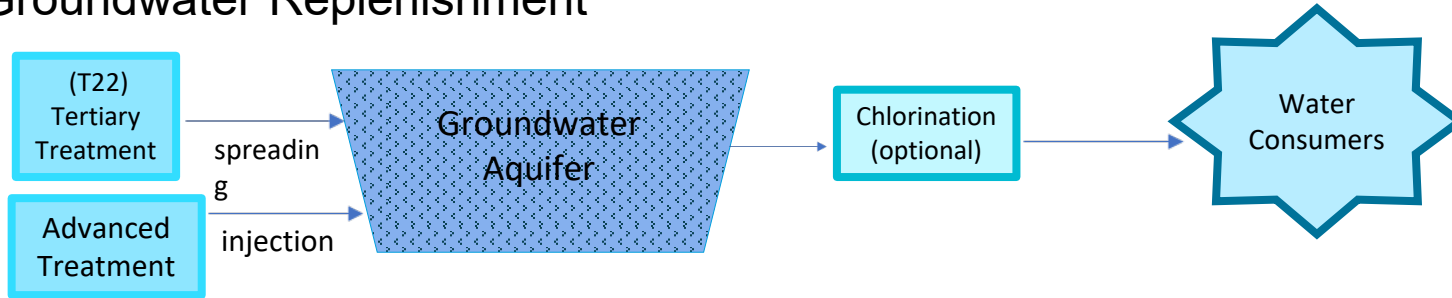


**\$234 M**

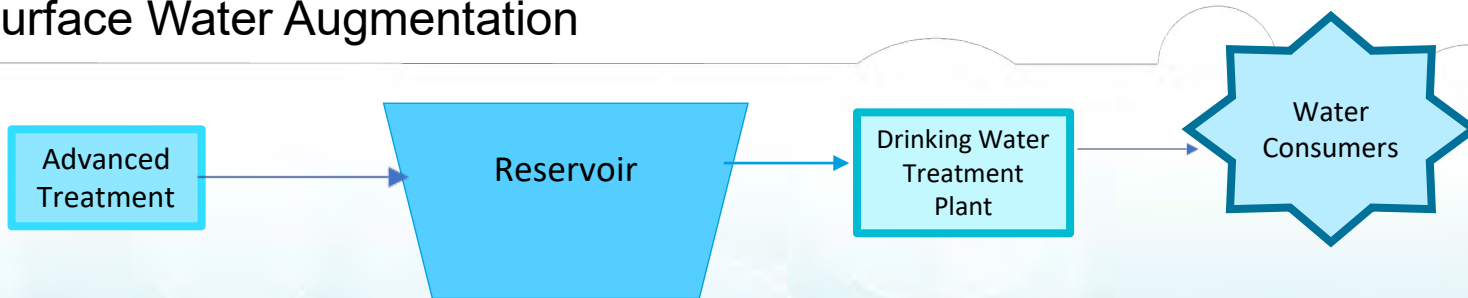
- Owner-Furnished Materials & Equipment
- JPA Administration & Professional Support Services
- Startup & Commissioning
- Program Contingency

# INDIRECT POTABLE REUSE

## Groundwater Replenishment



## Surface Water Augmentation

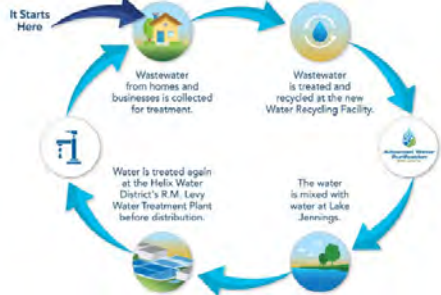
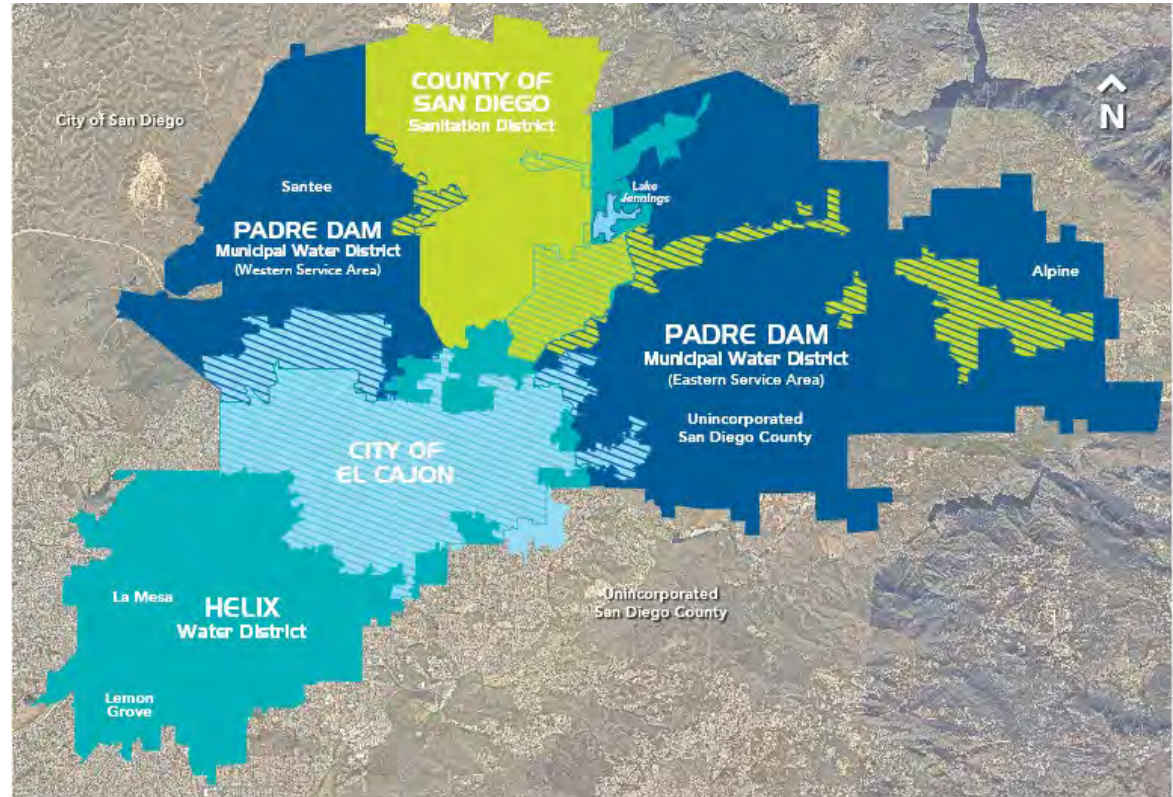




# PROGRAM SERVICE AREA

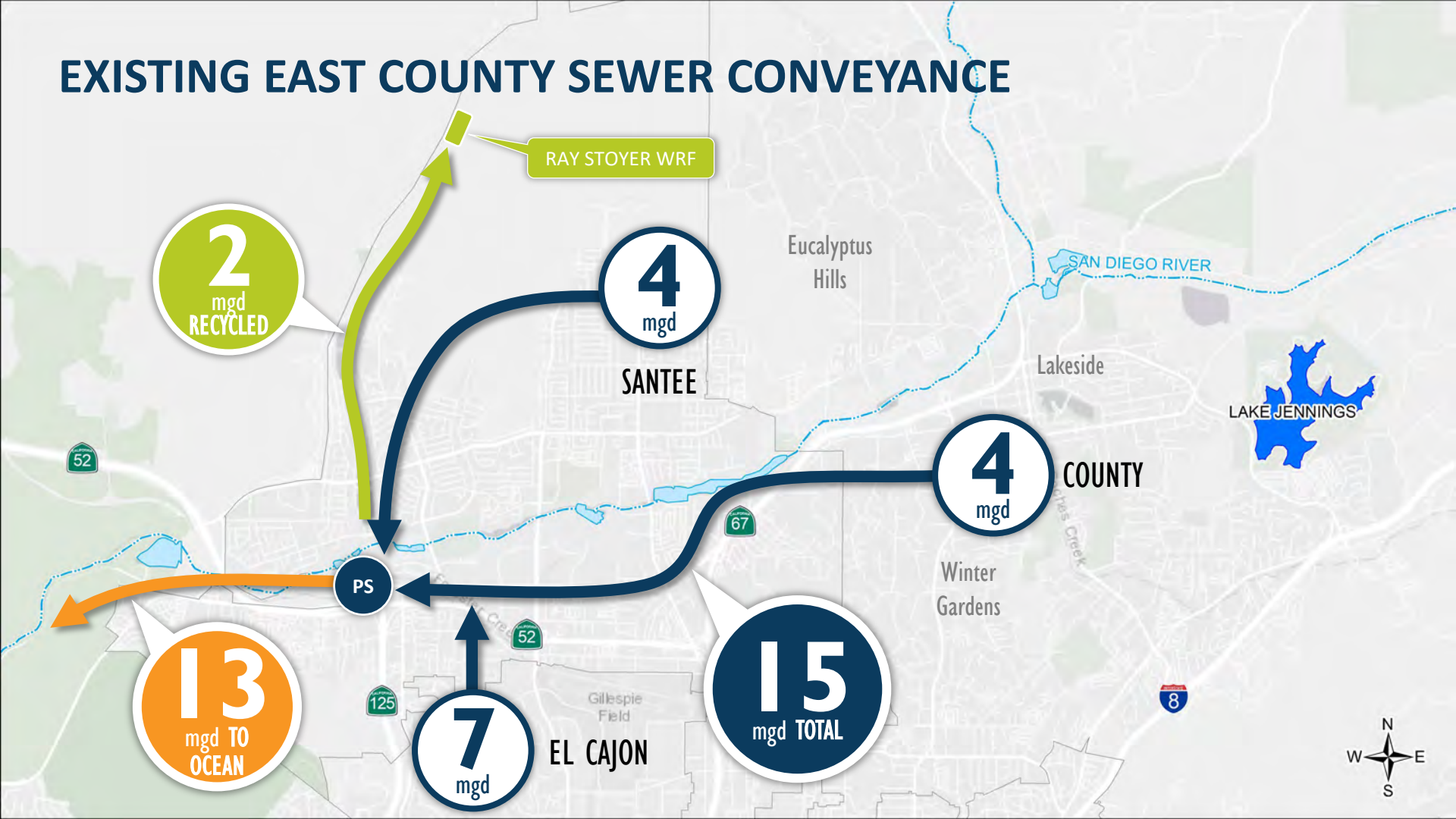
Purified water from this project will also be delivered to customers in the **Otay** and **Lakeside Water Districts**.

Additionally, **all of San Diego County** will benefit through increased water reliability for the region.





# EXISTING EAST COUNTY SEWER CONVEYANCE



RAY STOYER WRF

**2**  
mgd  
RECYCLED

**4**  
mgd

Santee

**4**  
mgd

County

PS

**13**  
mgd TO  
OCEAN

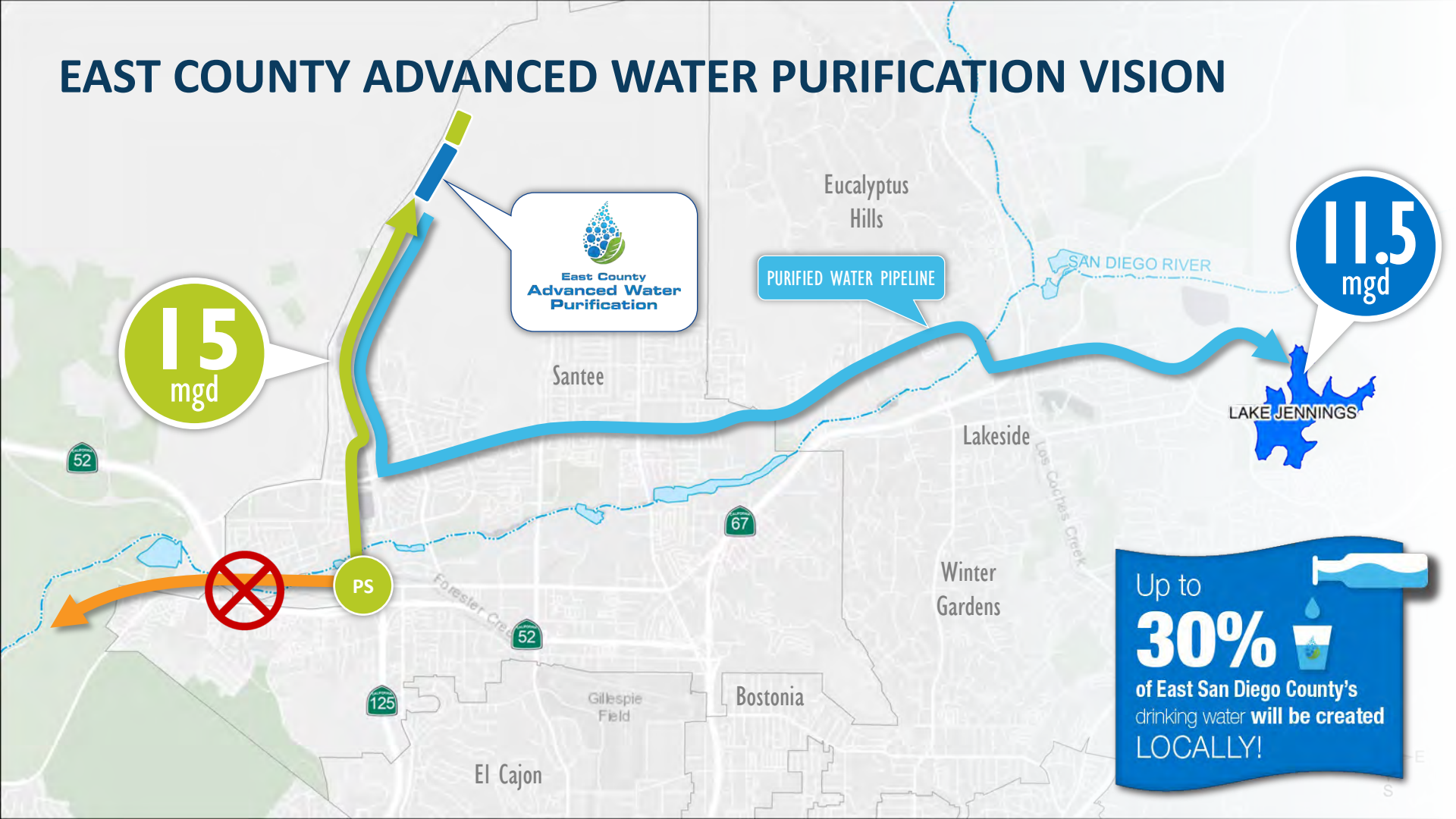
**7**  
mgd

El Cajon

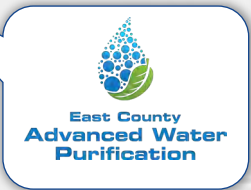
**15**  
mgd TOTAL



# EAST COUNTY ADVANCED WATER PURIFICATION VISION



15  
mgd



PURIFIED WATER PIPELINE

11.5  
mgd

Up to  
**30%**  
of East San Diego County's  
drinking water will be created  
**LOCALLY!**

# EAST COUNTY AWP PROJECT



## PACKAGE 3

Retrofit and Expansion of IPS, East Mission Gorge Pump Station, 3.5-Mile Force Main, 3-Mile Residuals Bypass Pipeline, and 1.7 mgd Lift Station

15 mgd

## PACKAGE 5

Energy Recovery



## PACKAGE 1

16 mgd WRF, 11.5 mgd AWP Facility, Solids Handling, Product Water Pump Station, Visitor's Center



11.5 mgd

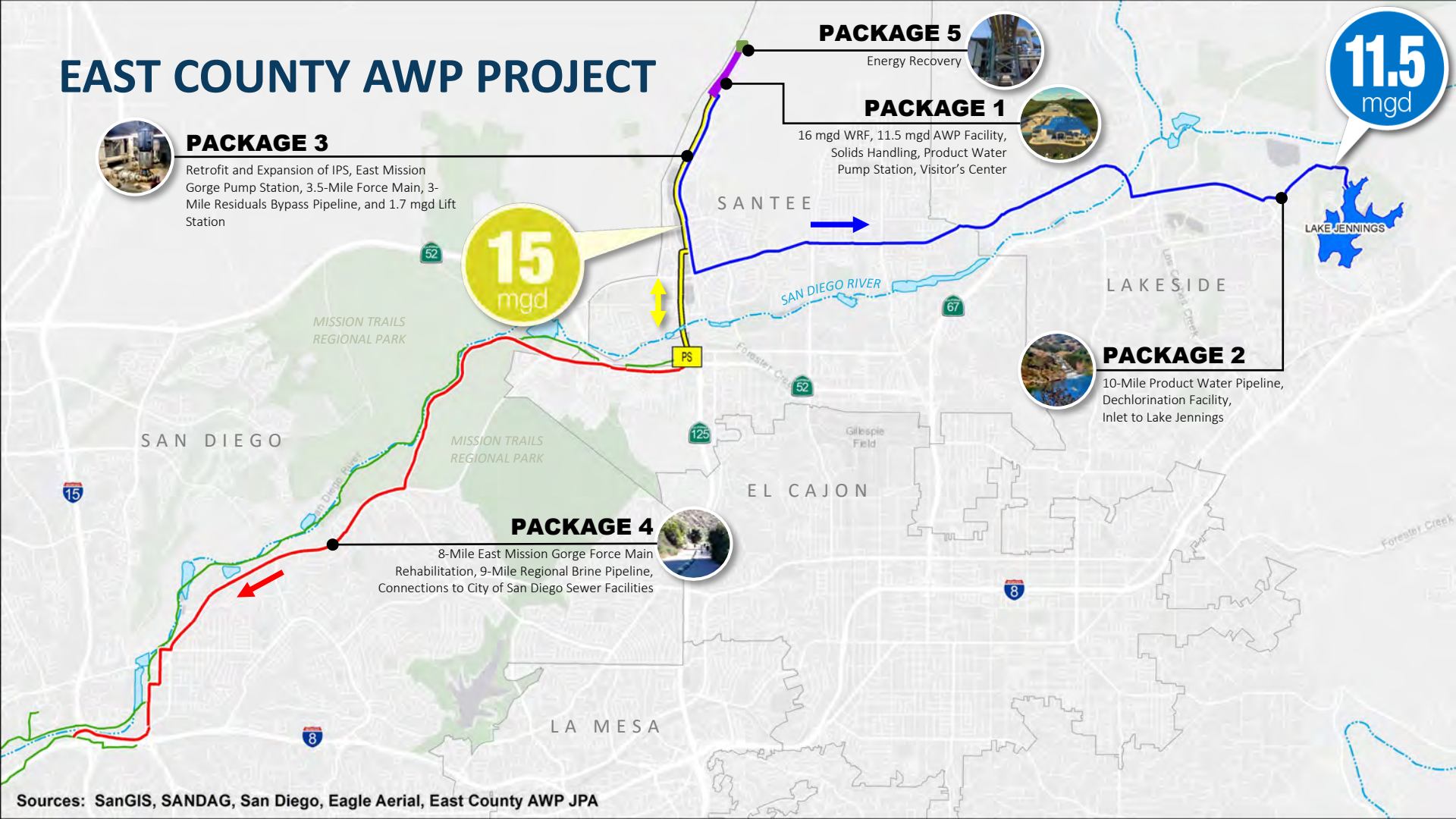
## PACKAGE 2

10-Mile Product Water Pipeline, Dechlorination Facility, Inlet to Lake Jennings



## PACKAGE 4

8-Mile East Mission Gorge Force Main Rehabilitation, 9-Mile Regional Brine Pipeline, Connections to City of San Diego Sewer Facilities





# CONSTRUCTION STATUS PACKAGE 1

**AECOM**

W.M. LYLES CO.

CONTRACTOR

Since 1945

*Progress Through Performance®*

- Mass grading completed
- Early design work packages completed to support construction
- Working towards final design documents
- Started structural concrete work with digesters, aeration basins, secondary clarifiers
- Major equipment procurement in progress





# CONSTRUCTION STATUS PACKAGE 2



- Final Pipeline design completed March 2023
- Pipeline construction began April 4, 2023.
- Over 5,000 feet of 24-inch CML&C Steel pipe has been fabricated and delivered to the site
- Final permit applications have been submitted and are being reviewed – County of San Diego, City of Santee, Caltrans and San Diego County Water Authority





# CONSTRUCTION STATUS PACKAGE 3

**AECOM**

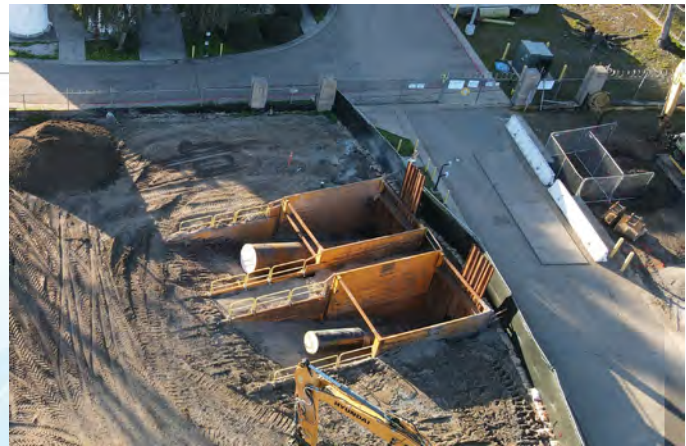
W.M. LYLES CO.

CONTRACTOR

Since 1945

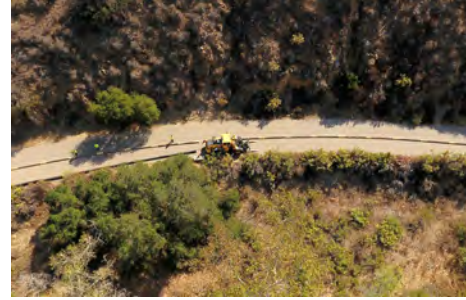
*Progress Through Performance®*

- Caltrans Encroachment Permit Obtained
- SDG&E Consent Agreements for HDD Obtained
- Early Work Package 2 Design Complete
- HDD Pilot Bore in Progress
- City of Santee Encroachment Permit for Open Cut in Progress
- Pump Station Major Equipment Procurement in Progress



# PROJECT STATUS

## PACKAGE 4 & 5



### PACKAGE 4:

- CEQA document completed
- Condition assessment of the East Mission Gorge Force Main
- In Design Phase

### PACKAGE 5:

- Contract awarded to Anaergia Technologies
- In initial stages of Environmental Phase





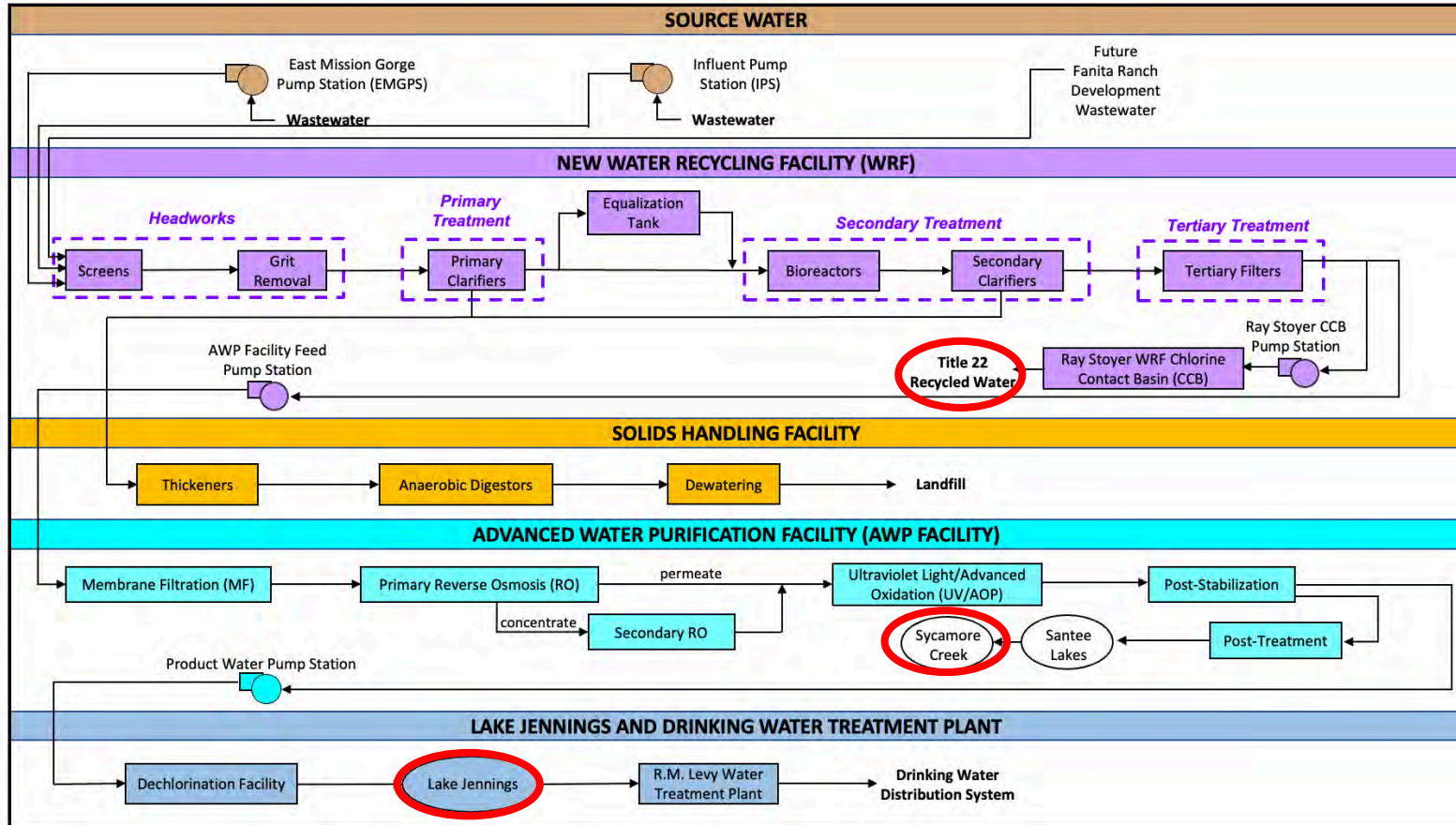
# Regulatory Permitting & Operational Readiness

**Seval Sen, P.E.**

*AWP Engineering Manager*



# USES OF PRODUCT WATER



# REUSE PERMITS INVOLVED

- DDW requirements
  - Pathogen removal credits
  - Lake modeling
  - Residence time
- RWQCB requirements
  - Basin Plan
  - CA Toxic Rule
  - Monitoring and Reporting Plan
  - Report of Waste Discharge

NPDES Permit for  
Lake Jennings



- RWQCB requirements
  - Renewal of existing permit with different source water
  - Flow and nutrient loading limitations
  - Report of Waste Discharge

NPDES Permit for  
Sycamore Creek



- RWQCB requirements
  - Renewal of existing permit with different source water
  - Title 22 Engineering Report
  - Report of Waste Discharge

Non-Potable  
Reuse Permit





# REGULATORY PERMITTING ASPECTS OF THE PROJECT



# AWP DEMO PLANT OPERATION



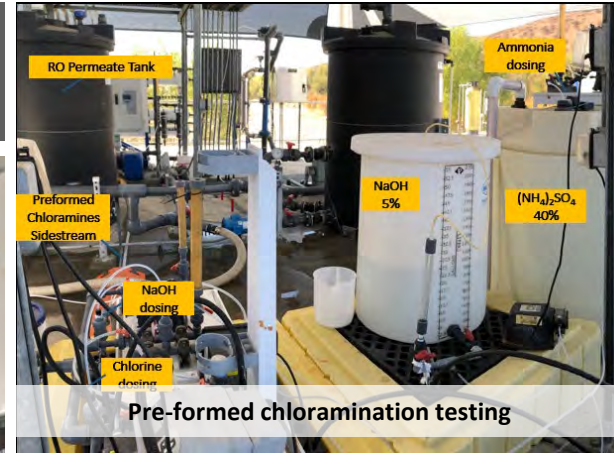
Free chlorine pathogen credits testing



RO pathogen removal testing



Desalitech as brine minimization technology



Pre-formed chloramination testing



Online strontium analyzer

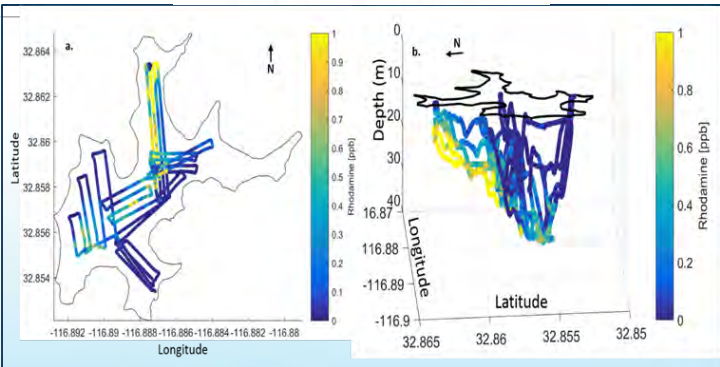
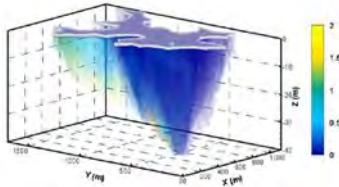
From Parts



# LAKE JENNINGS TRACER STUDY

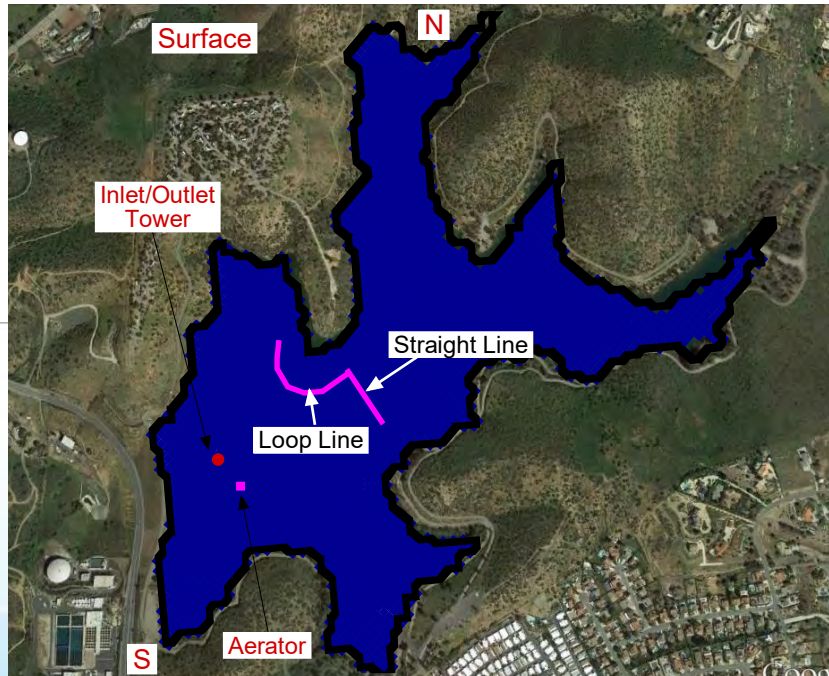
- Rhodamine WT Dye used
- Performed by Scripps Institution of Oceanography
- Measured online using fluorometer

Simulation

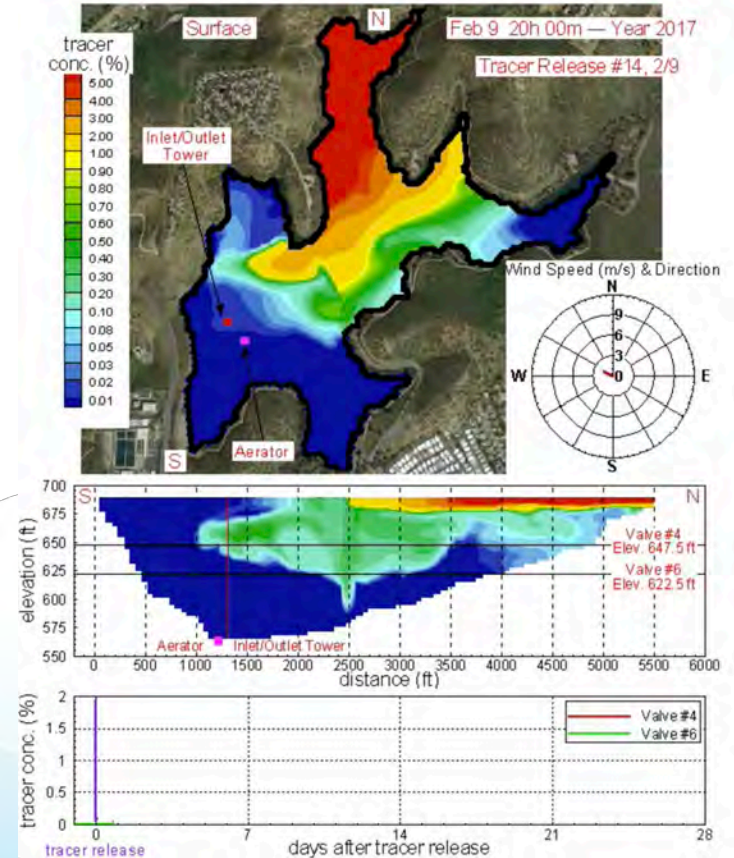


# LAKE JENNINGS TRACER STUDY

- 35+ lake modeling completed
- Providing engineered mixing to assure dilution requirements all times



Lake Jennings Hydrodynamics Modeling - AWP Water Tracer  
Scenario: Run#12 (12.5 MGD AWP Water, WSEL = 690 ft)





# PATHOGENIC MICROORGANISM CONTROL



Pathogen	MF	RO	UV/AOP	Pipeline Cl <sub>2</sub>	Required Prior to Discharge to Lake Jennings	Total Prior to Discharge to Lake Jennings	Redundancy
Virus	0	3	6	6	8	15	7
<i>Giardia</i>	4	3	6	1	7	14	8
<i>Crypto</i>	4	3	6	0	8	13	7

- Turbidity
- Strontium
- UVT, UVI
- Chlorine Residual
- Pressure Decay Test
- TOC
- UV Dose
- Flow Rate
- Conductivity
- Flow Rate
- Temp, pH

Continuous or Daily monitoring to confirm pathogen reduction



# OPERATIONS INTEGRATION

Padre Dam's operators have been involved in the project from **concept to construction** and will be **hands on** during startup, testing, and commissioning.

💧 Pilot Plant

✓ Regulatory Permitting

↔ SCADA

🏗️ Design

🏠 Construction

🎓 Training & Certification





# OPERATIONAL READINESS



AWP Demonstration Facility

✓ Gained 6 yrs of operational experience



AWTO Certification

✓ Currently have two AWTO Grade 5 certified operators and growing!



Partnering with other Agencies

✓ Creating opportunities for hands on training for new hires



Training

✓ Focus training classes by vendors and consultants



Staffing/Hiring Plan

✓ Growing from 9 operations staff to 34 staff at 8-12 hr shifts



Ready for Commissioning

✓ Decommission Ray Stoyer WRF earlier to allow staff to get trained ahead

THANK YOU



# Pure Water San Diego

Jeff Pasek, Pure Water Project Manager

# Pure Water San Diego Program Update

WaterReuse, San Diego Chapter

May 17, 2023

- North City Project (Phase 1)
  - Construction
    - *Progress*
    - *Challenges*
  - Financing
  - Outreach
  - Operational Readiness
- Status of Central Area Project (Phase 2)





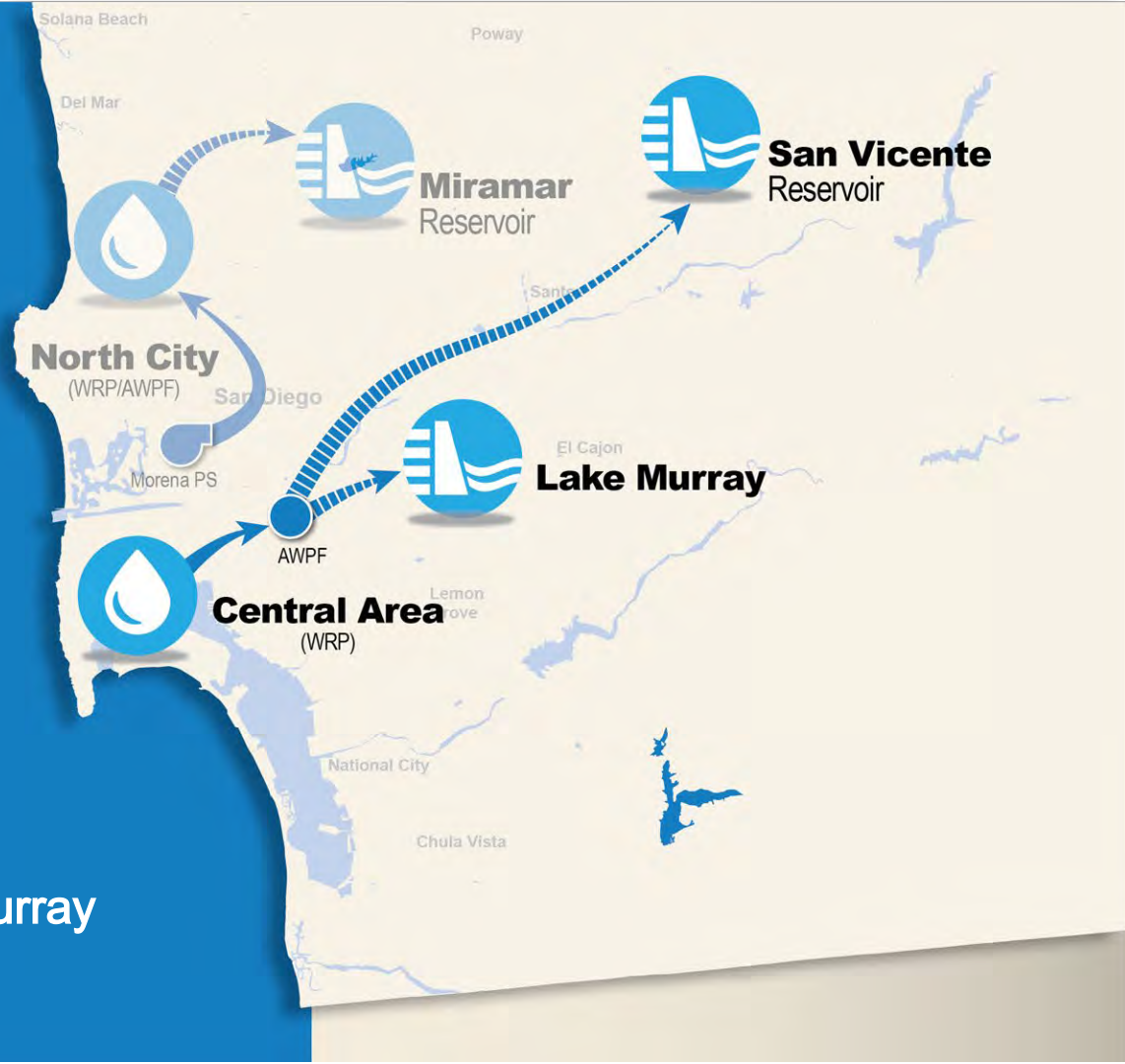
**Pure Water**  
will produce

**1/2**

of San Diego's water  
**locally**

**Phase 2**  
**Central Area Project**

- 2035 Completion
- 53 mgd
- Central Area PWF to San Vicente or Lake Murray



# Point Loma Wastewater Treatment Plant

- Regional treatment and ocean discharge
- Enhanced primary treatment
- Secondary treatment is the national standard
- Requires waivers
- A very challenging location





# Components of the North City Project



**PHASE 1** | 30 mgd by 2025 | North City

- MBC** | Metropolitan Biosolids Center
- NCWRP** | North City Water Reclamation Plant & Flow Equalization Basin
- NCPWF** | North City Pure Water Facility & Pump Station
- NCPWP** | North City Pure Water Pipeline, Dechlorination Facility and Subaqueous Pipeline



**PUMP  
STATION**



**WATER  
FACILITY**



**BIOSOLIDS**





# Construction Contracts



## Miramar Water Treatment Plant

Construction Contract	Bid Award	Contractor
Morena Pump Station	\$110.4M	Flatiron
Morena Southern/Middle Alignment	\$129.7M	Sukut
Morena Northern Alignment	\$95.2M	OHL
Penasquitos Pump Station Oxygenation System	\$4.4 M	Blue Pacific Engineering
Water Reclamation Plant Expansion	\$255.1M	Kiewit
Water Reclamation Plant Equalization Basin	\$11.9M	Kiewit
Metro Biosolids Center Improvements	\$40.1M	PCL
NCWRP/NCPWF Early Sitework	\$16.4M	AECOM/ Shimmick
Pure Water Facility and Pump Station	\$356.7M	Shimmick
Pure Water Pipeline	\$123.5M	W.A. Rasic
Miramar Reservoir Water Quality Monitoring System	\$1M	Soundnine, Inc.
Miramar Reservoir PS	\$12.7M	Shimmick
<b>Total</b>	<b>\$1,157.1 M</b>	<b>Authorized: \$1,212.2M</b>



- 10 major contracts
- Several lesser contracts
- One system for producing pure water
- Scope
  - *Pipeline: ~30 miles*
  - *Pumping capacity: nearly 100 million gallons per day (mgd)*
  - *New Treatment capacity: 55 mgd*
- Total Amount Awarded, \$1.16 billion
- Thru December 31, 2022:
  - *Total Expenditures, \$274.46 million*
  - *Pooled Contingency Use, \$13.5 million*
- Estimated completion, 1/3

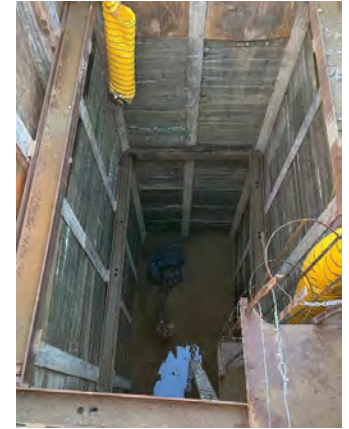




- North City Pure Water Facility and Pump Station
  - *Majority of subsurface work completed*
  - *Process and Operations & Maintenance buildings in progress*
  - *Equipment for the pump station is being delivered and installed*
- North City Water Reclamation Plant Expansion
  - *"Mega" trench complete*
  - *All areas of the plant have active construction*

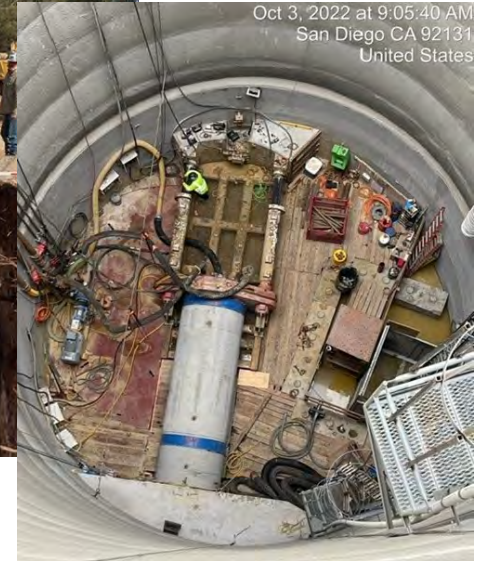
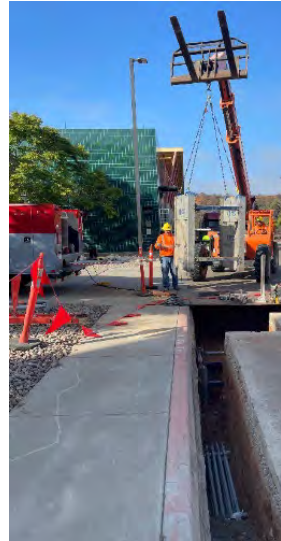


- **Morena Northern Pipelines and Tunnels**
  - *Interstate 805 tunnel – Installation started this month, 10% complete*
  - *Pipe installation on Genesee Avenue and Executive Drive is underway*
- **Morena Pump Station**
  - *Junction chamber excavation complete*
    - Rebar and concrete forms installed
  - *Secant wall under construction*





- North City Pure Water Pipeline
  - *Pipe installation on Miramar Road underway*
  - *Tunnel from Scripps Ranch Business Park to Evans Pond – complete*
  - *Shaft for tunnel into Miramar Reservoir - complete*
- Metro Biosolids Center Improvements
  - *Specialty equipment completed factory testing, scheduled for delivery*





- Industry-wide
  - *COVID and War in Ukraine*
    - Supply chain disruptions
    - Limited skilled labor pool
- Pure Water-specific
  - *Pipeline installation*
    - 9 tunnels to cross freeways, railroads, sensitive habitat
    - Deepest tunneling shaft: 100 feet deep
    - 1-mile subaqueous pipeline at bottom of Miramar Reservoir
    - 11 miles requires 14-foot-wide trench
  - *SDGE conflicts*
  - *North City Water Reclamation Plant – must maintain plant operation during construction*
  - *Complexity of Systemwide Start-up*



# SD Morena Pump Station Update

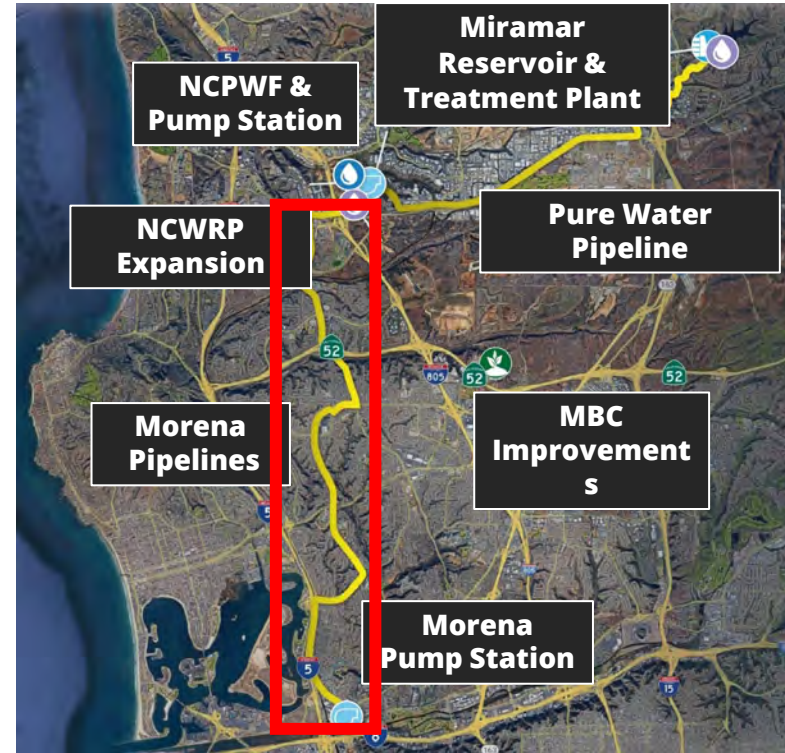


- New 37-mgd pump station
- Contractor – Flatiron, Inc., began construction in April, 2021
- Contract Amount - \$110 Million
- Site Dewatering Changed Condition
  - *Council-authorized not-to-exceed amount (August 2022) - \$20 million*
  - *Secant wall construction cost - \$12.5 million*
  - *Contractor time impact analysis under review*



# SD Revised Commissioning Strategy

- Wastewater flow to North City is greater than recycled water demand
- Leverage surplus wastewater to start producing Pure Water prior to Morena Pump Station completion
- Increase Pure Water production to 30 mgd after Morena Pump Station is online
- "Partial" Phase 1 Commissioning to begin when all non-Morena projects are completed
  - *Isolates Morena Pump Station, minimizes program impacts*





- Low-Interest USEPA and State Revolving Fund (SRF) Loans
  - *USEPA WIFIA Program - \$733.5 million total*
    - \$614 million @ 1.29%
    - \$119.5 million loan @ 1.82%
    - Reimbursements as of December 31, 2022: \$134.5
  - *SRF - \$664 million total*
    - Interest rates range from 0.8% to 1.1%
    - Reimbursements as of December 31, 2022 : \$9.9 million
- Grants
  - *The City has received \$81.5 million in grants*
  - *This equates to a direct savings to ratepayers*



WIFIA  
PROGRAM



CALIFORNIA  
Water Boards  
STATE WATER RESOURCES CONTROL BOARD  
REGIONAL WATER QUALITY CONTROL BOARDS



- New Phase 1 North City interactive traffic closure map
- Monthly Pure Water Community Working Group Updates
- Community events near project alignments
- Construction-related inquiries via community phone lines
- Distributed project and schedule info through door hangers, fliers, social media, email blasts





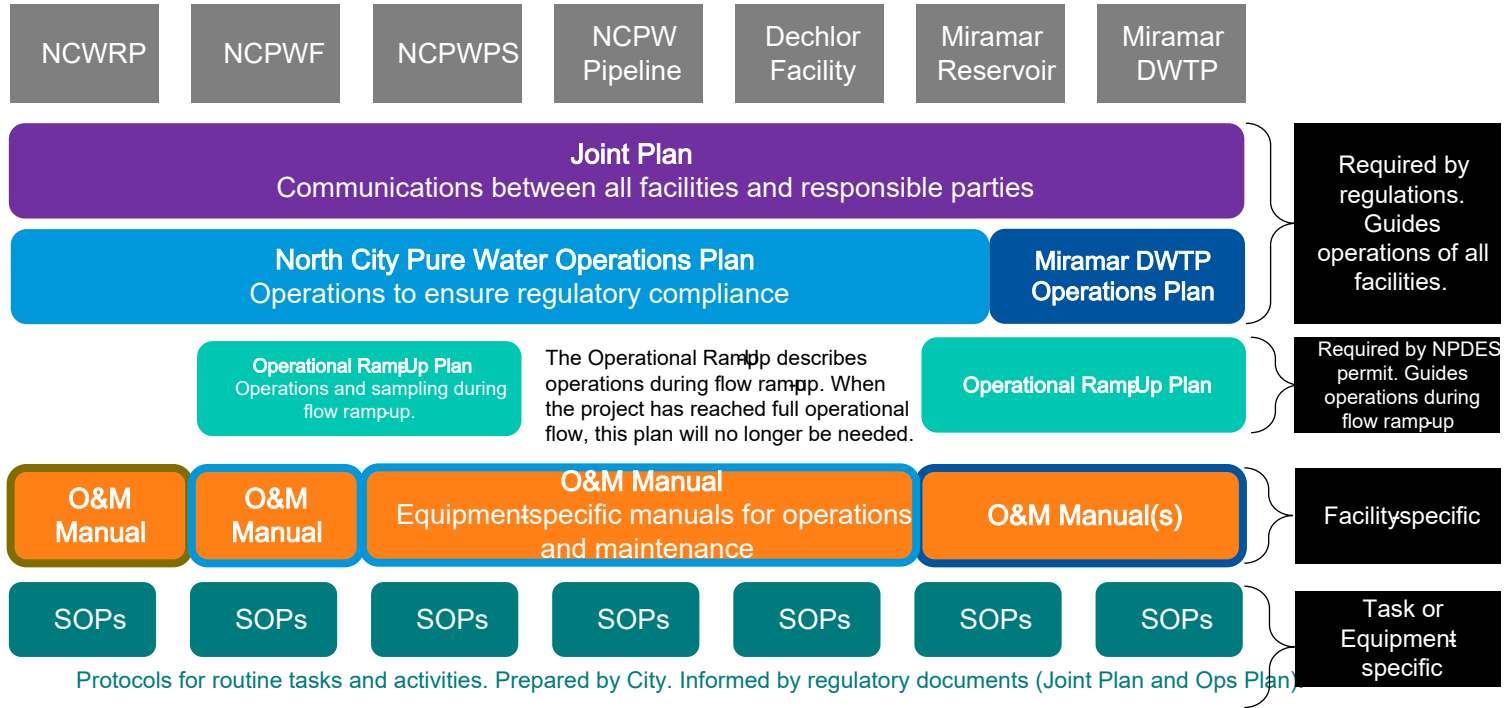
# Improvements at Water Treatment Plant and Reservoir

- Treatment Residuals Handling
  - *Reroute from reservoir to sewer*
  - *Total project cost estimate: \$29 million*
- New Caustic Soda Chemical System
  - *Increases operational flexibility and reliability*
  - *Anticipated requirement in updated Miramar Water Treatment Plant permit*
  - *Total project cost estimate: \$1.6 million*
- Boat Dock and Launch Ramp
  - *Raise these features above future reservoir level*
  - *Total project cost estimate: \$2 million*





# Operations Plans



- Staffing plan
  - *Maintenance personnel*
  - *Operators*
  - *Instrumentation & Control technicians*
  - *Laboratory staff*
- Hiring progress
- Operator Certification Training
  - *Pure Water San Diego recognized as a "founding agency" of the State's certification program*
- Staff engaged during construction





# Status of Central Area Project (Phase 2)

## Central Area Small Scale Facility, Demonstration Testing

- Contract Award: May 2023
- Construction Complete: Early 2025
- Operations: 2025 - 2026

## Program Management Consultant Procurement

- Interviews: January 2023
- Finalize negotiations: May 2023
- Request approval to award: July/Sept 2023
- Initial task: validate Phase 2 basis of design and facility plans





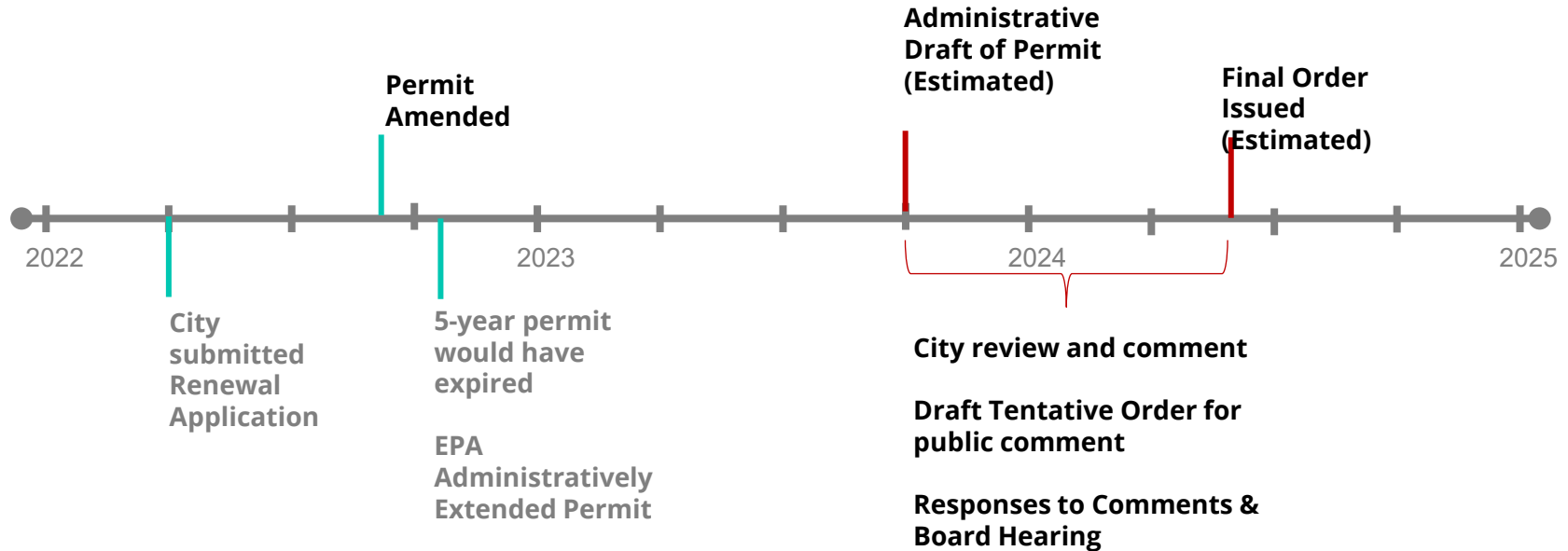


- Direct Potable Reuse Regulations must be adopted December 31, 2023
- San Diego submitted a detailed Phase 2 Concept Proposal as a “real world” example of how draft regulations could be applied
- Phase 2 Concept Proposal identified several areas where the regulations could be improved
- Division of Drinking Water modifying regulations





# Update – Point Loma Discharge Permit



# Tour of AWPf Construction Site

