

From Lab to Tap: How Advanced Tech is Solving Local Water Challenges

EBMUD Orinda WTP Disinfection Improvements Project

Chris Cleveland, P.E.

May 7, 2026



Photo Credit: East Bay Municipal Utility District
Claremont Tunnel Inspection, November 2016



Agenda

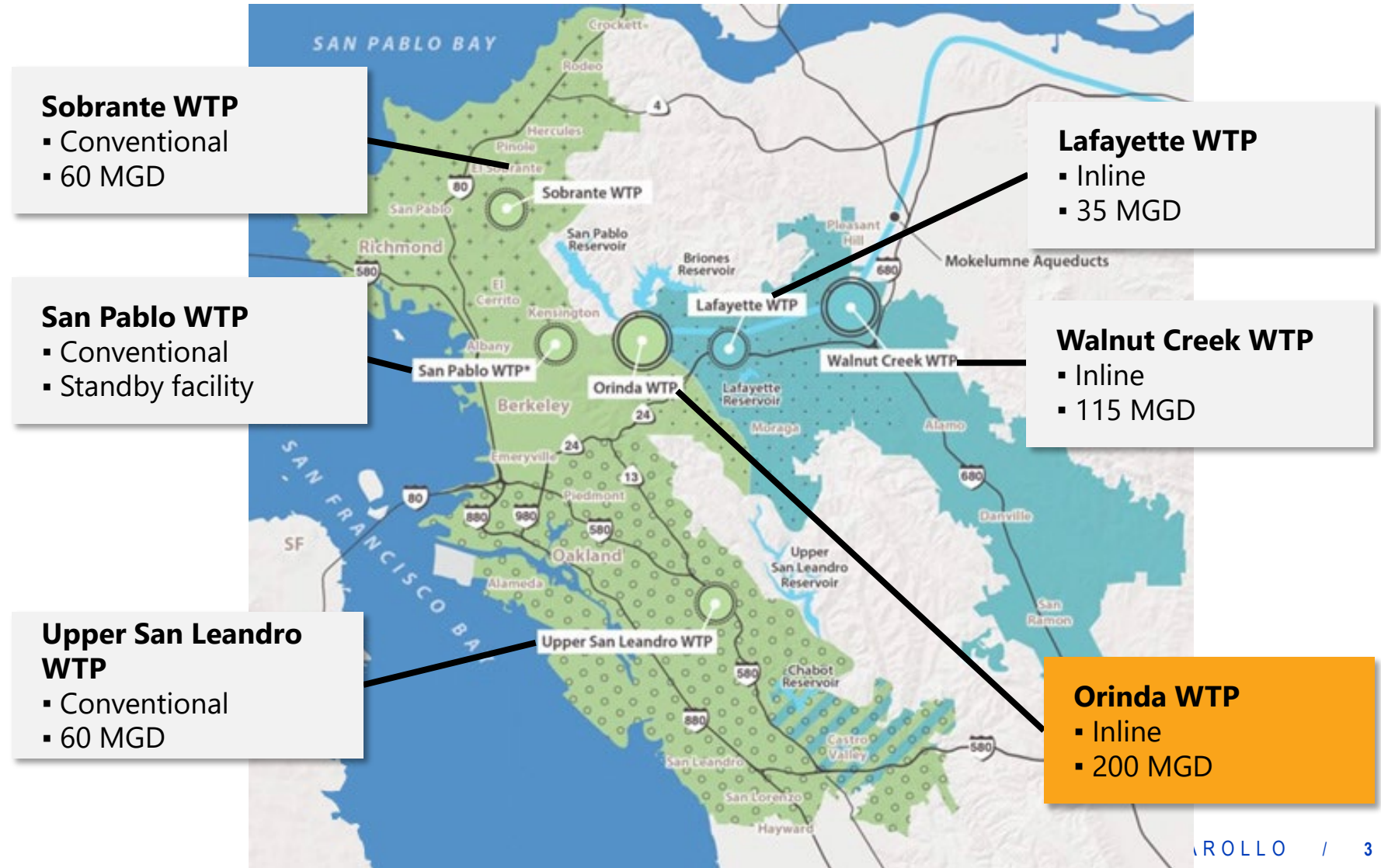
1. Background and Project Drivers
2. Alternatives Development, Evaluation, & Selection
3. Innovative Project Features
4. Innovative Design Process
5. Current Project Status

East Bay Municipal Utility District

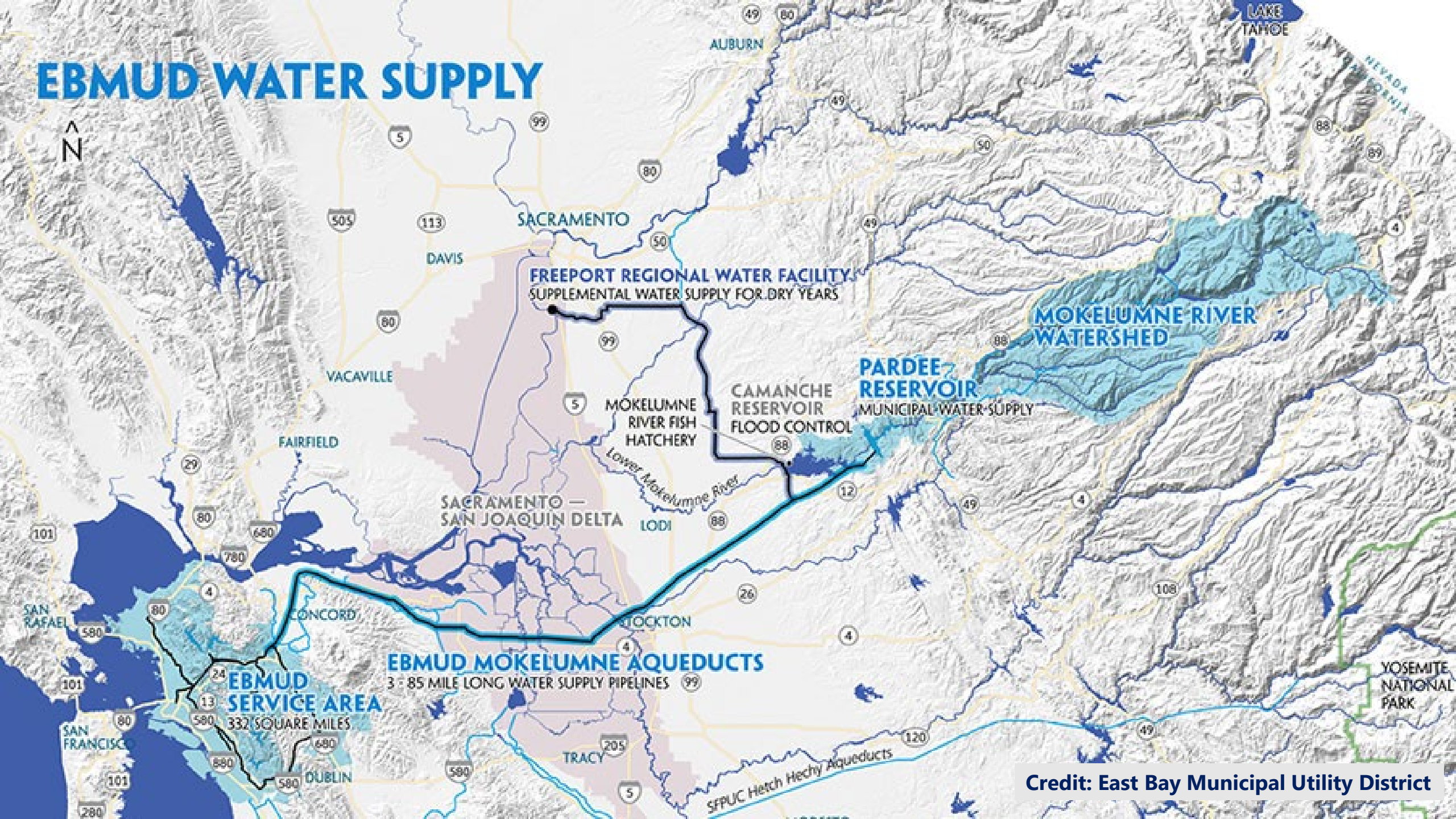


District Service Area:

- 1.4 million customers
- 330 square mile service area
- 20 cities including Oakland



EBMUD WATER SUPPLY



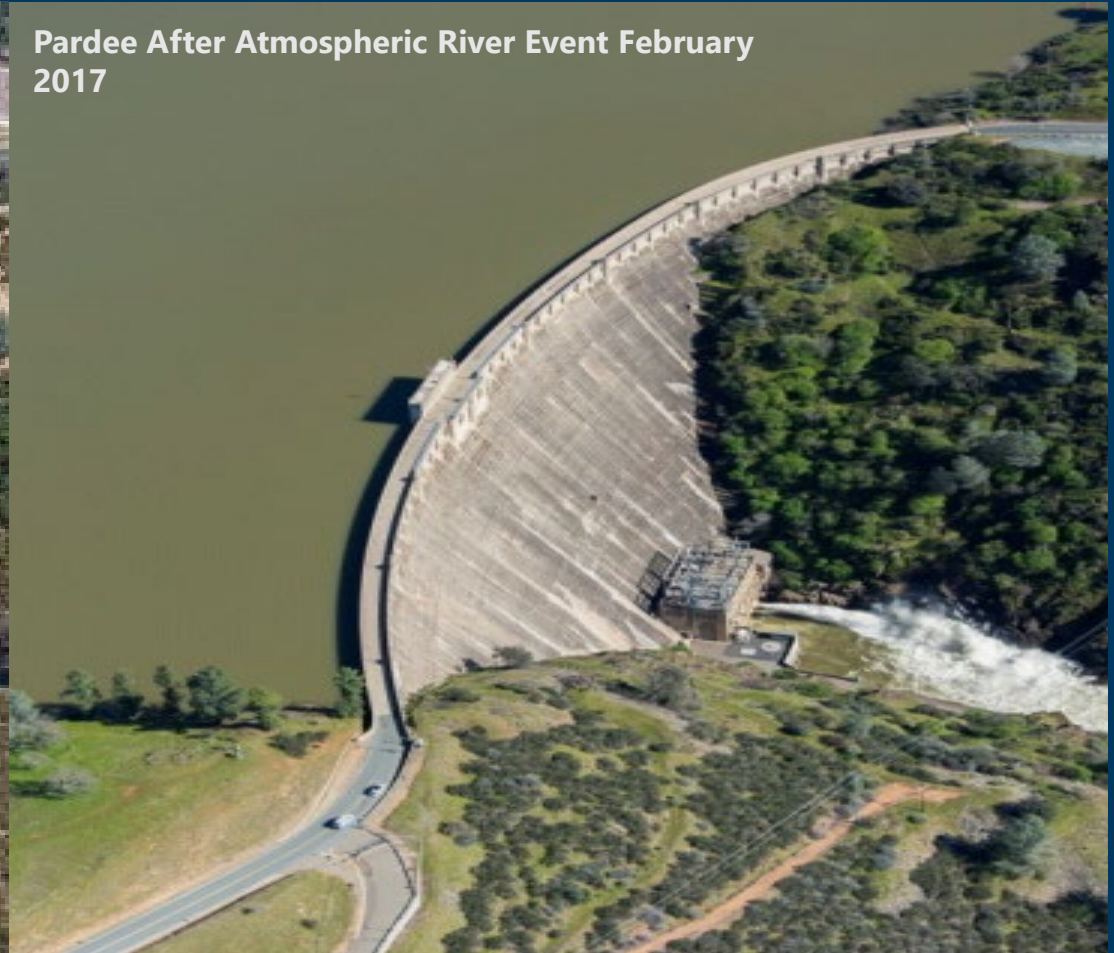
Credit: East Bay Municipal Utility District

Initial Immediate Project Driver: Trihalomethanes

Pardee Reservoir
Typical Conditions



Pardee After Atmospheric River Event February
2017



Existing Facility Overview

San Pablo Creek

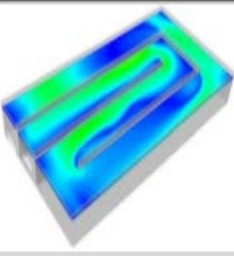
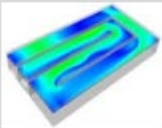
Goal:

- Reduce DBPs by eliminating prechlorination requirement

Challenges:

- Site Constrained
- Hydraulics
- Sensitive Location
- Critical Water Producer
- Constructability
- Flood Prone

Alternatives Evaluation

Alternatives			
1	2	3	4
<u>200 MGD UV & 1.5 MG CCB</u>	<u>12 MG CCB</u>	<u>6 MG CCB</u>	<u>Ozon 1.5M</u>
			

Challenges:

- Site Constraints
- Hydraulics
- Sensitive Location
- Critical Water Producer
- Constructability
- Flood Prone

Disinfection Strategy

- UV Disinfection - Giardia
- Chlorine Contact Basin (CCB) - Viruses
- i.e Use each for what they're best at

Disinfection Improvements Project Concept

New Below-Grade UV
Disinfection Facility

New Below-Grade 1.4 MG
Chlorine Contact Basin

New 108" Claremont
Tunnel Connection

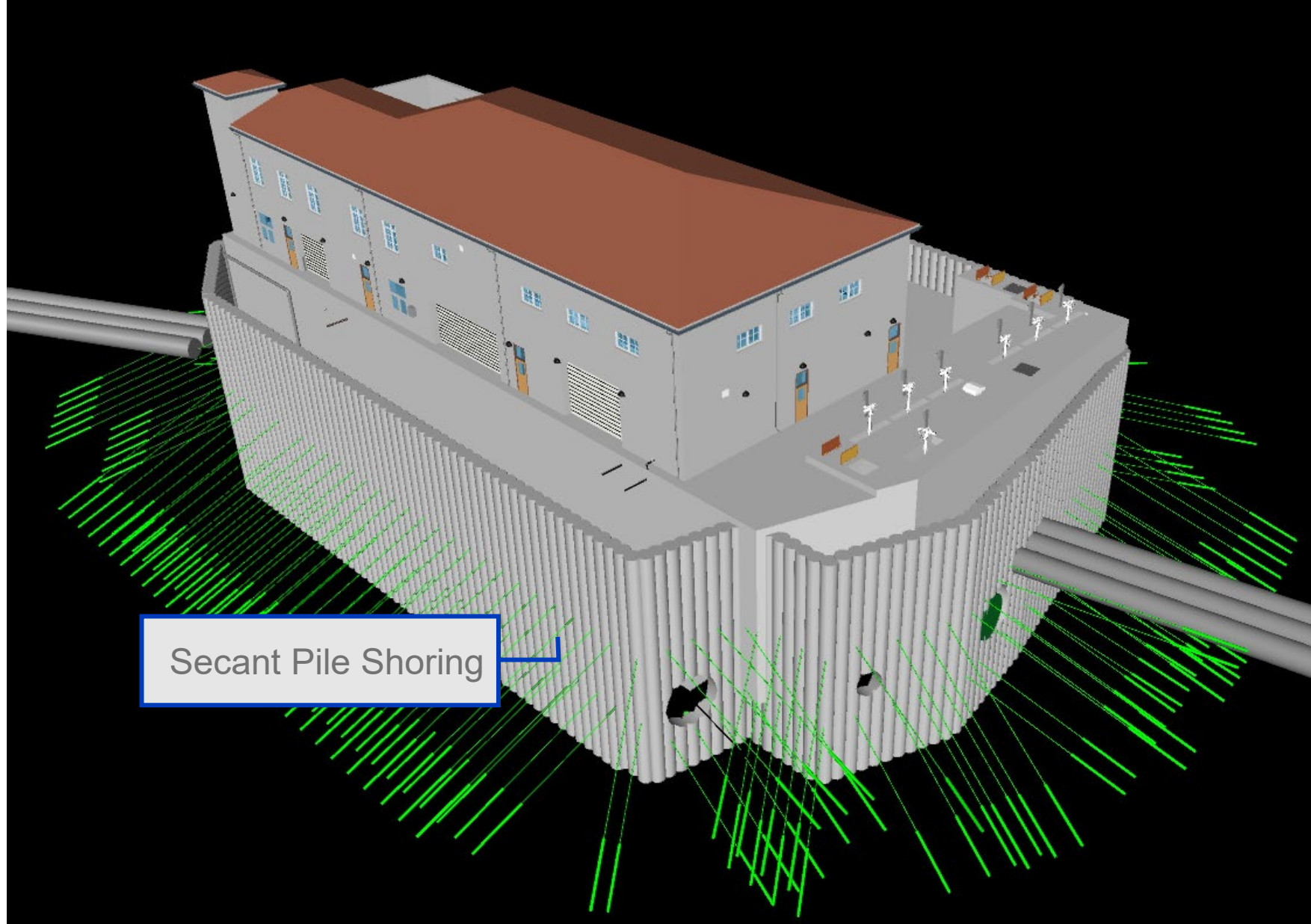
Demo & Large Excavations with
Secant Pile Shoring System

New 108" CFE Tunnel

New 78" Effluent
2 Tunnel



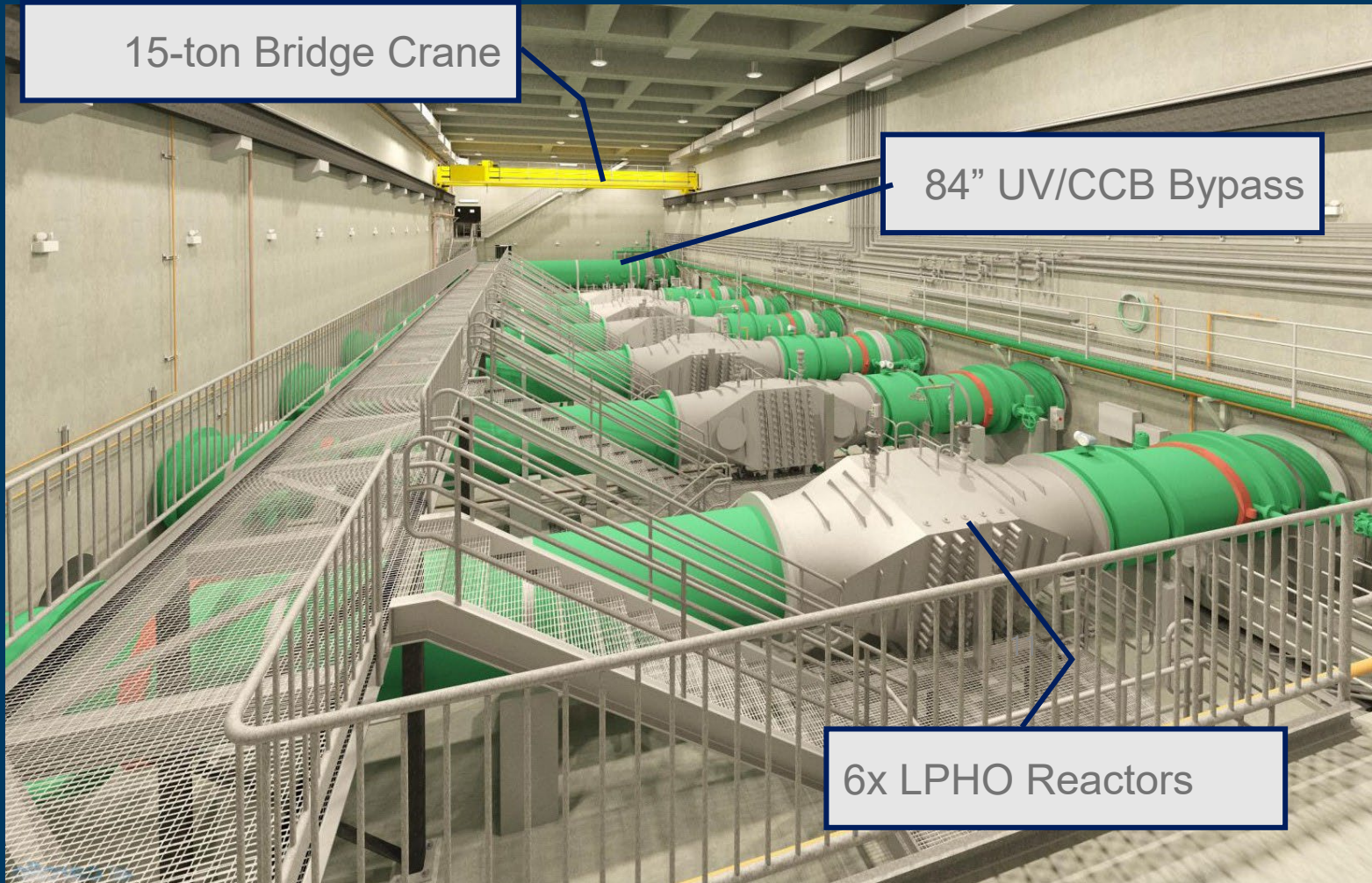
The Maintenance and UV Electrical Facility (MAUVE)



Secant Pile and Excavation Construction



Innovative Deep UV Disinfection



Description	Criteria
Design Flow	200 mgd
Min. Giardia Credit	1 Log
Min. UV Dose	2.1 mJ/cm ²
% Off-spec Water	0

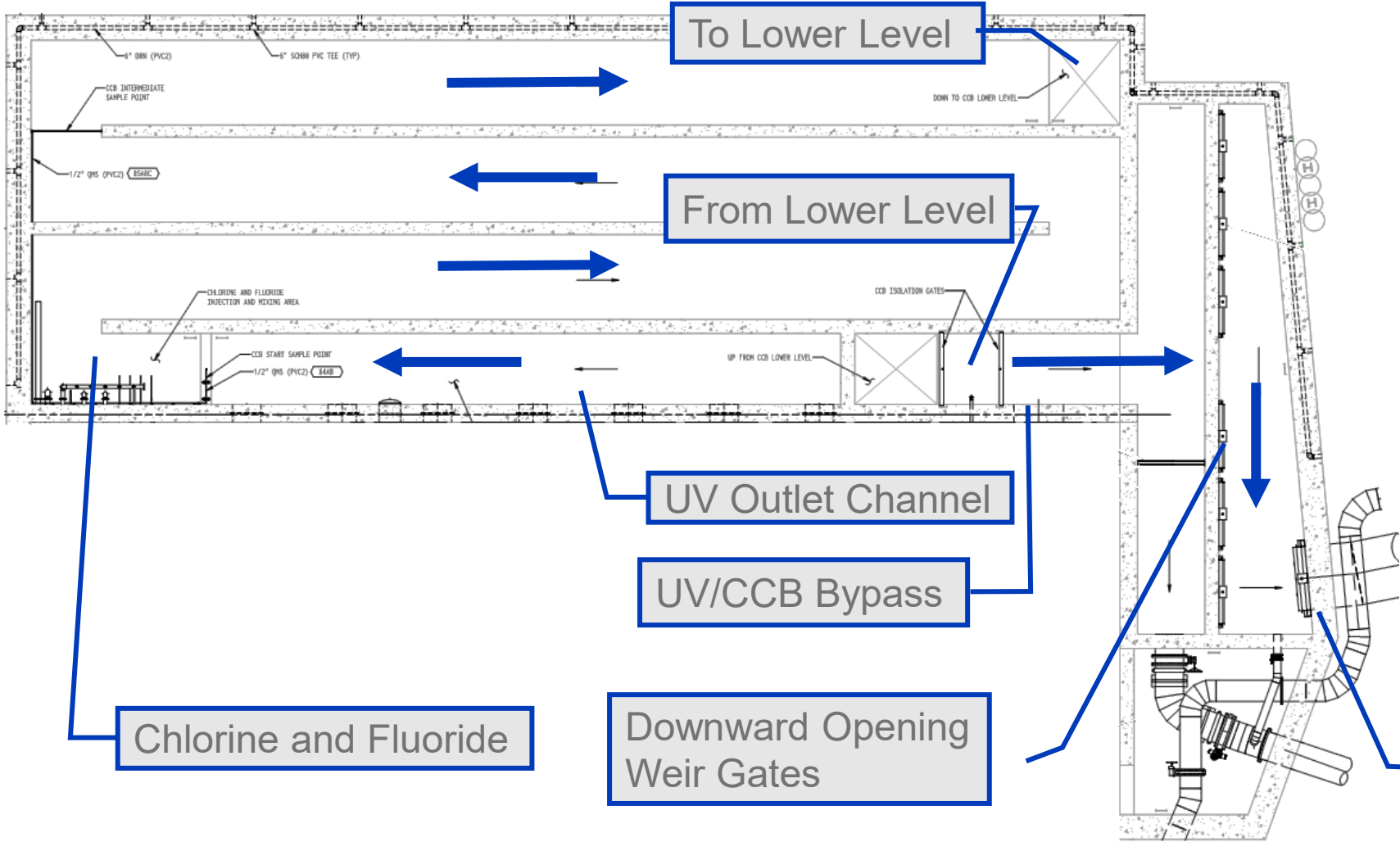
Features:

- Deep to meet hydraulic grade line
- Passive flow split
- Optimized UV dose for low power usage

UV Disinfection Room Construction

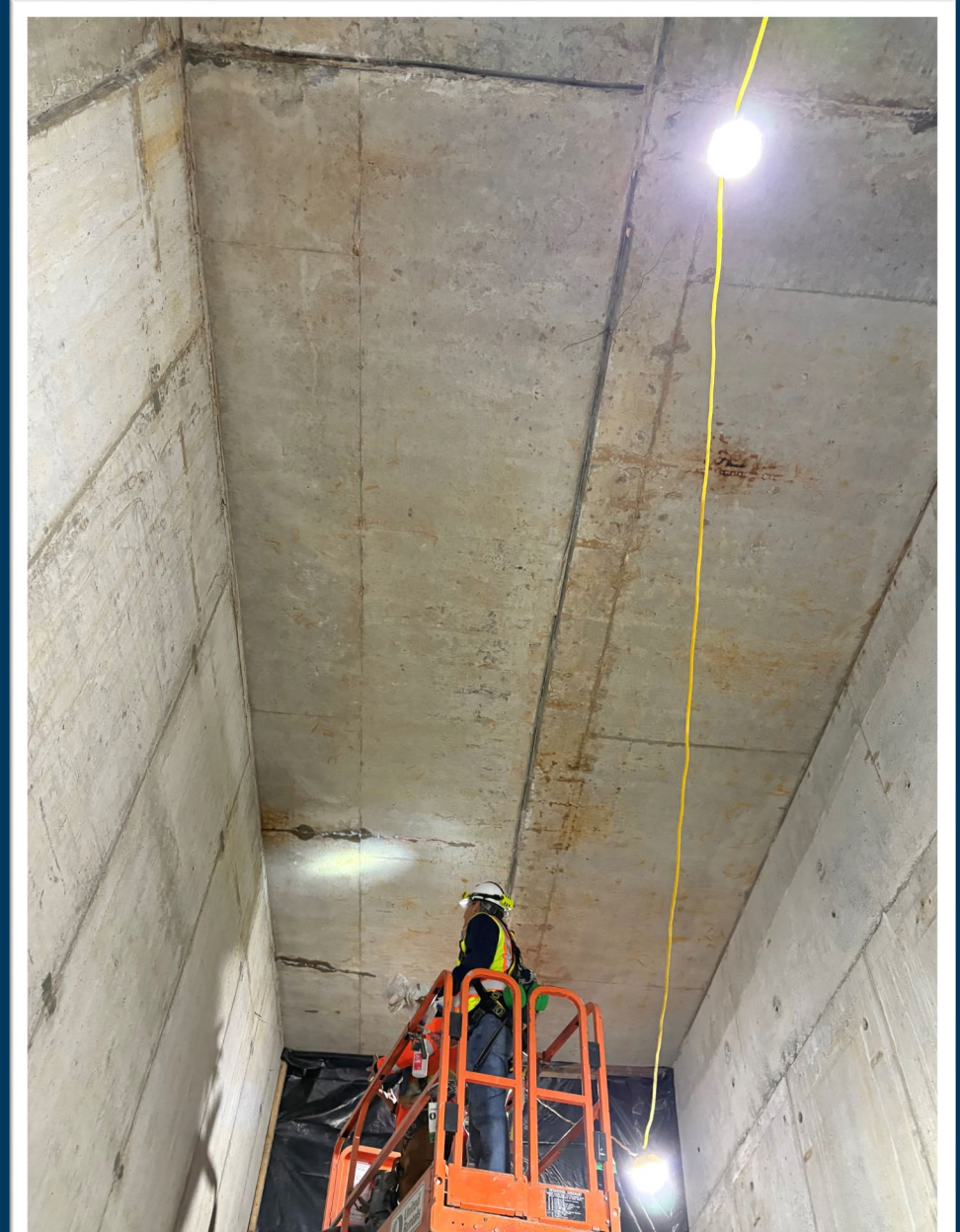


Double Decker Chlorine Contact Basin



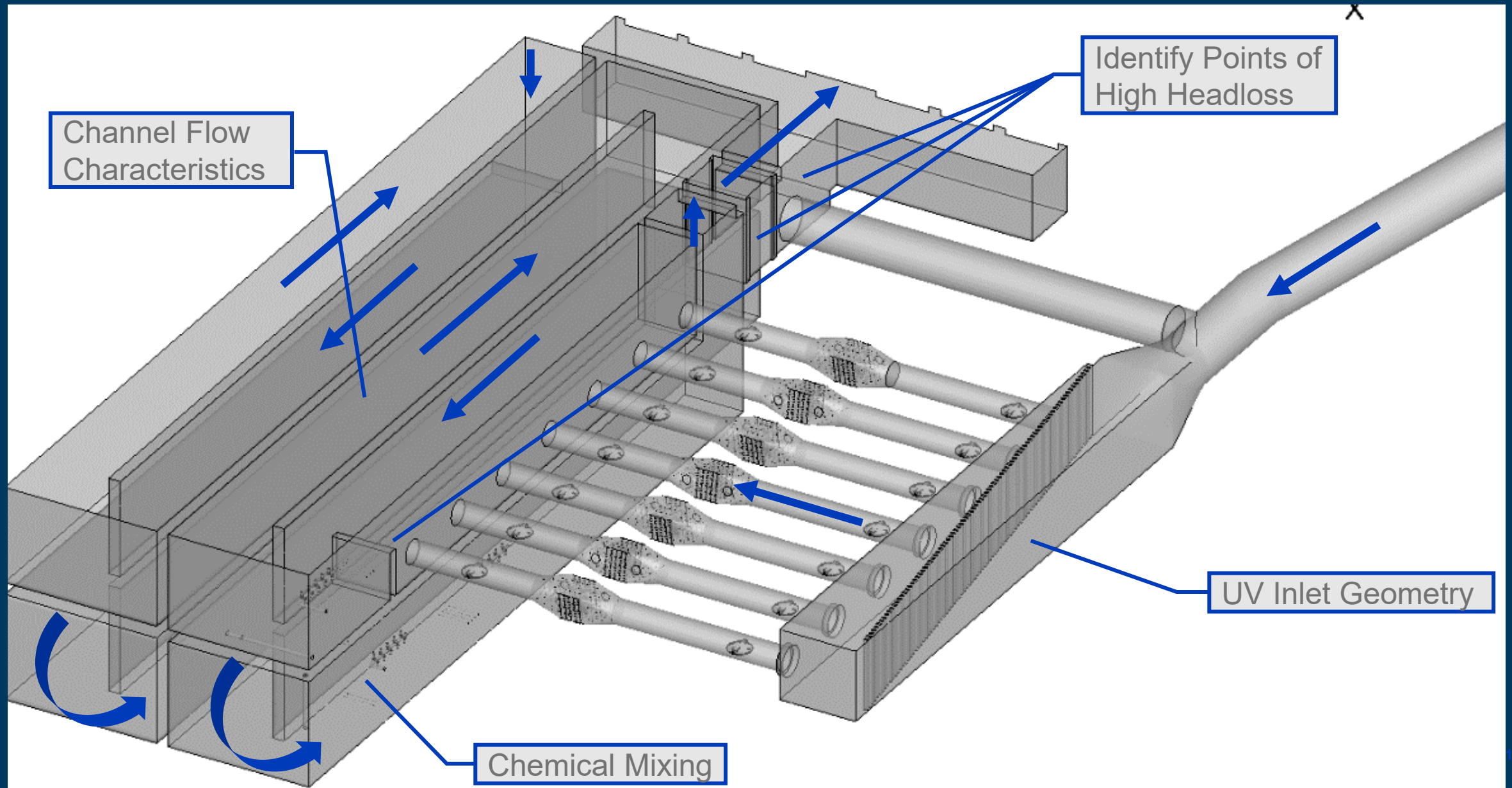
Description	Criteria
Design Flow	200 mgd
Effective Volume	1.4 MG
Min. Contact Time	10 min
Design Baffling Factor	0.5
Min. Cl ₂ Residual	2 mg/L
Design Virus Credit	7.5 log
% Off-spec Water	0

Chlorine Contact Basin Construction

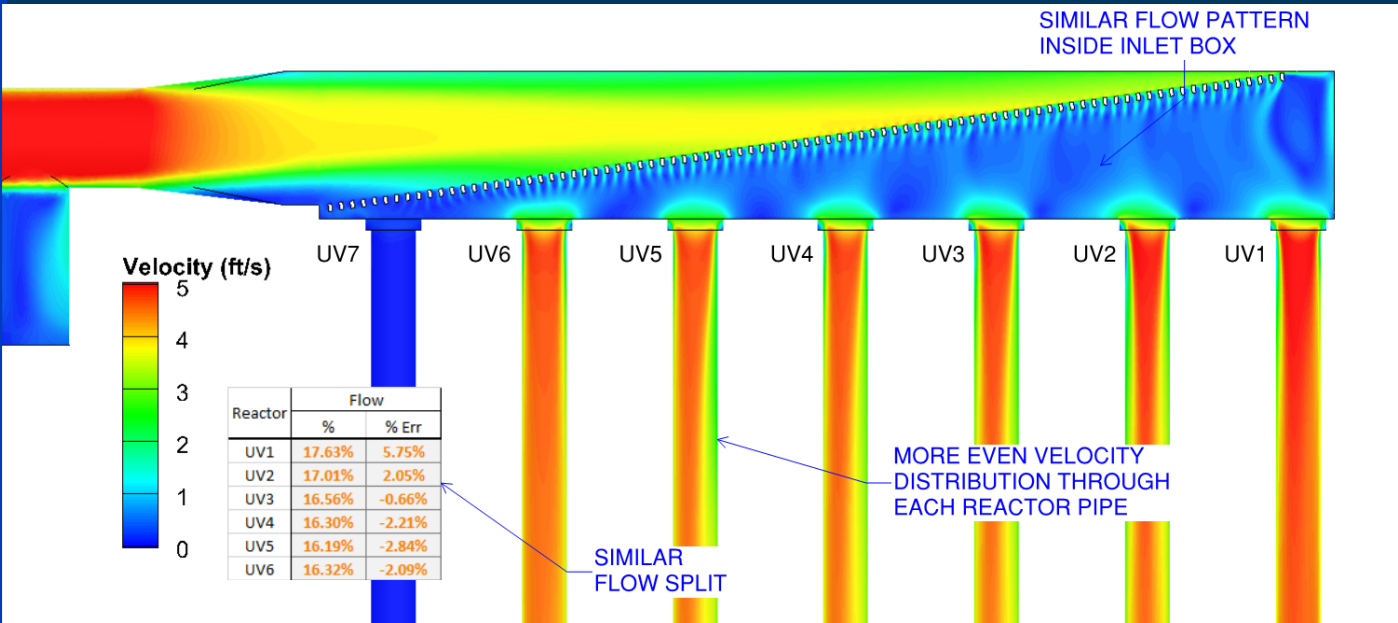
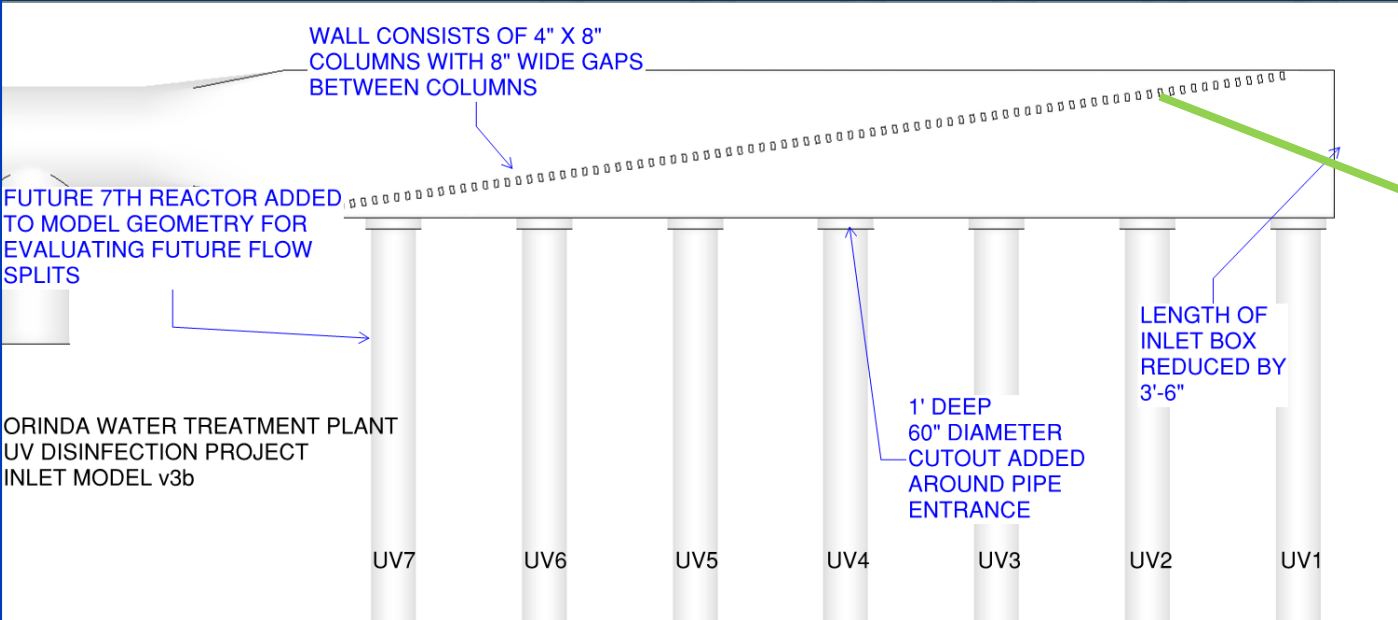


63 feet

Minimal Available Head for New Treatment Processes



UV Inlet Optimized for Flow Split and Low Losses



New processes fit within 4-feet of created available head

Visualizing a First Ever Facility for Design Phase Input



Construction Status

MAUVE Second Floor

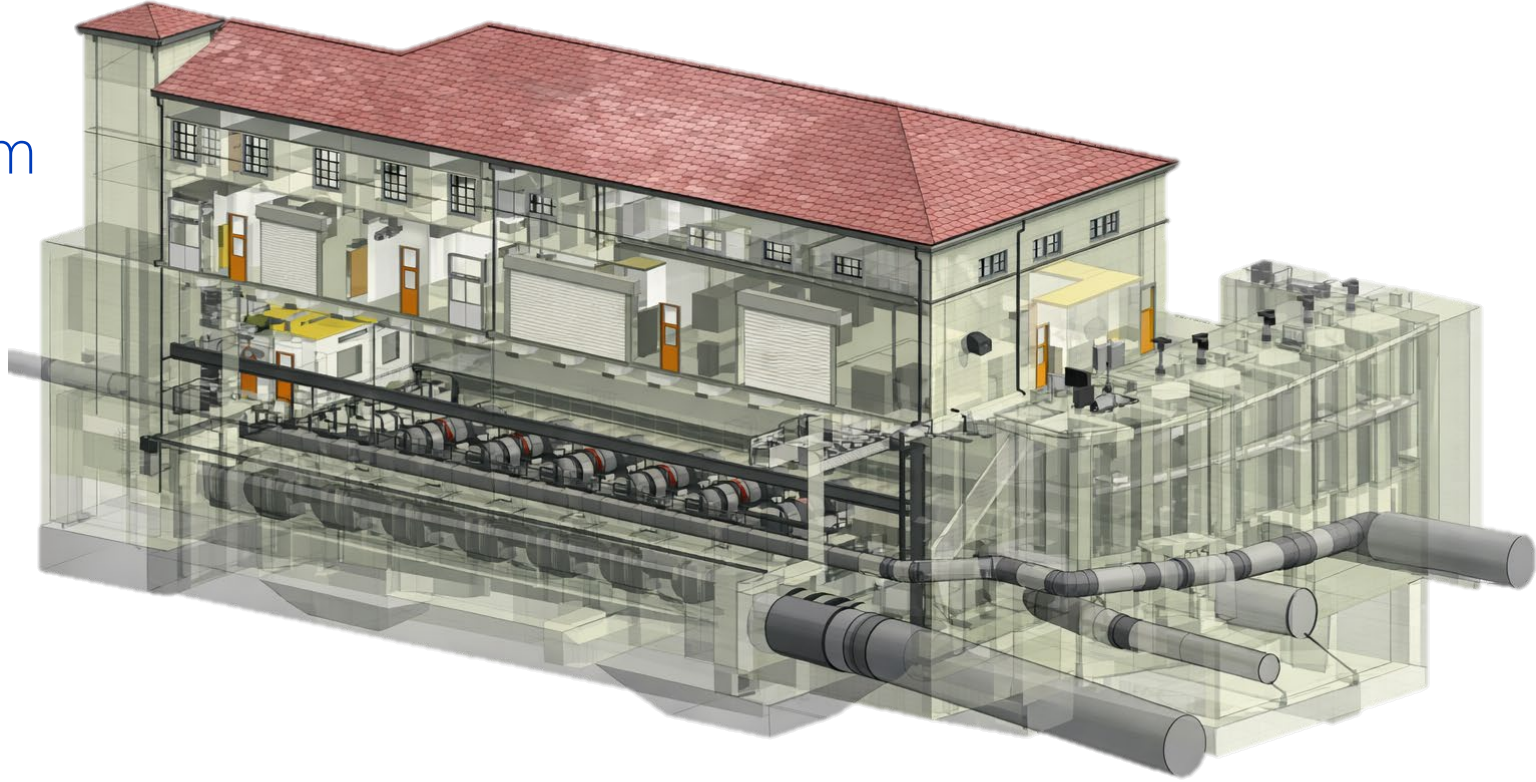
Burying CCB

Chlor

Treated Water
Gate Structure

Acknowledgements

- EBMUD Executive Leadership Team
- Jeff Bandy, Michael Hartlaub
 - EBMUD Design Division
- Tim Karlstrand & CM Team
 - EBMUD CM Division
- Flatiron Team
- Carollo Engineers Design and ESDC Team



From Lab to Tap: How Advanced Tech is Solving Local Water Challenges

EBMUD Orinda WTP Disinfection Improvements Project

Chris Cleveland, P.E.

May 7, 2026



Questions