



West County Wastewater Clean & Green Upgrading to the Future

Keith Reynolds Jr., PMP Senior Project Manager, West County Wastewater, CA
Guyton Durnin, PE, CCM, Construction Manager, HDR INC

Introductions



Keith Reynolds Jr., PMP
Senior Project Manager



Guyton Durnin, PE, CCM
Construction Manager



Outline

- I. West County Wastewater Clean & Green Project**
- II. Progressive Design Build Contract Considerations**
- III. AWWA D110 Type I Prestressed Concrete Digesters**
- IV. Q&A**



West County Wastewater Clean & Green Project

West County Wastewater



1921

West County Wastewater District formed to serve 15,000 residents in San Pablo and North Richmond. 24-inch outfall to Castro Creek

1955

Constructed a 6 million gallon-per-day (mgd) primary treatment plant

1963

Sludge drying lagoon and other improvements

1972-75

Secondary treatment expansion to 12.5 mgd

Past/Current Operations

- ▶ Old Digesters red tagged; WCW lost the opportunity to create biogas for cogeneration
- ▶ Old DAFT technology



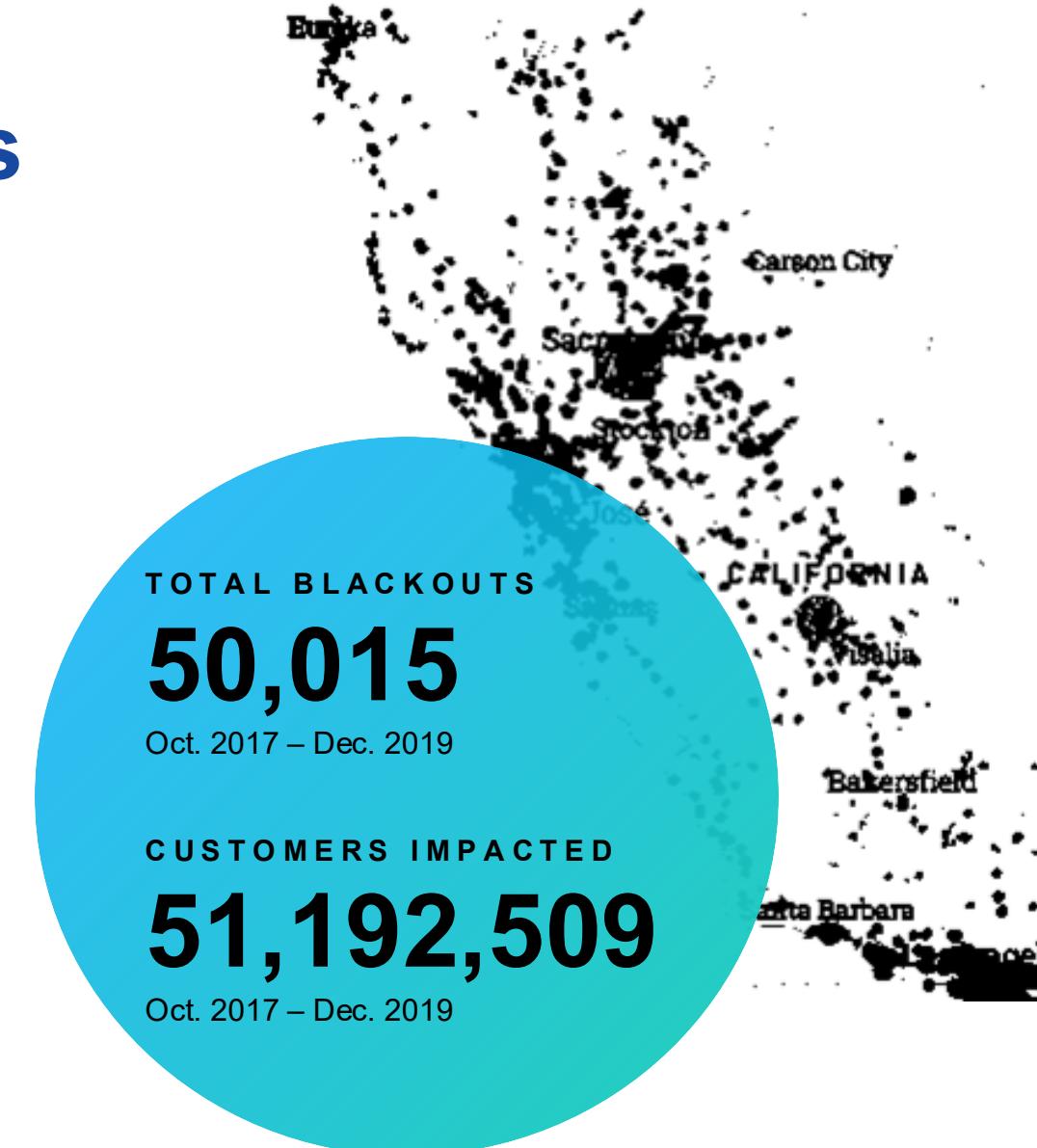
Past/Current Operations

- ▶ \$2-\$6M/year in excess belt press contractor fees & landfill disposal
- ▶ Use of drying beds means methane escapes to atmosphere

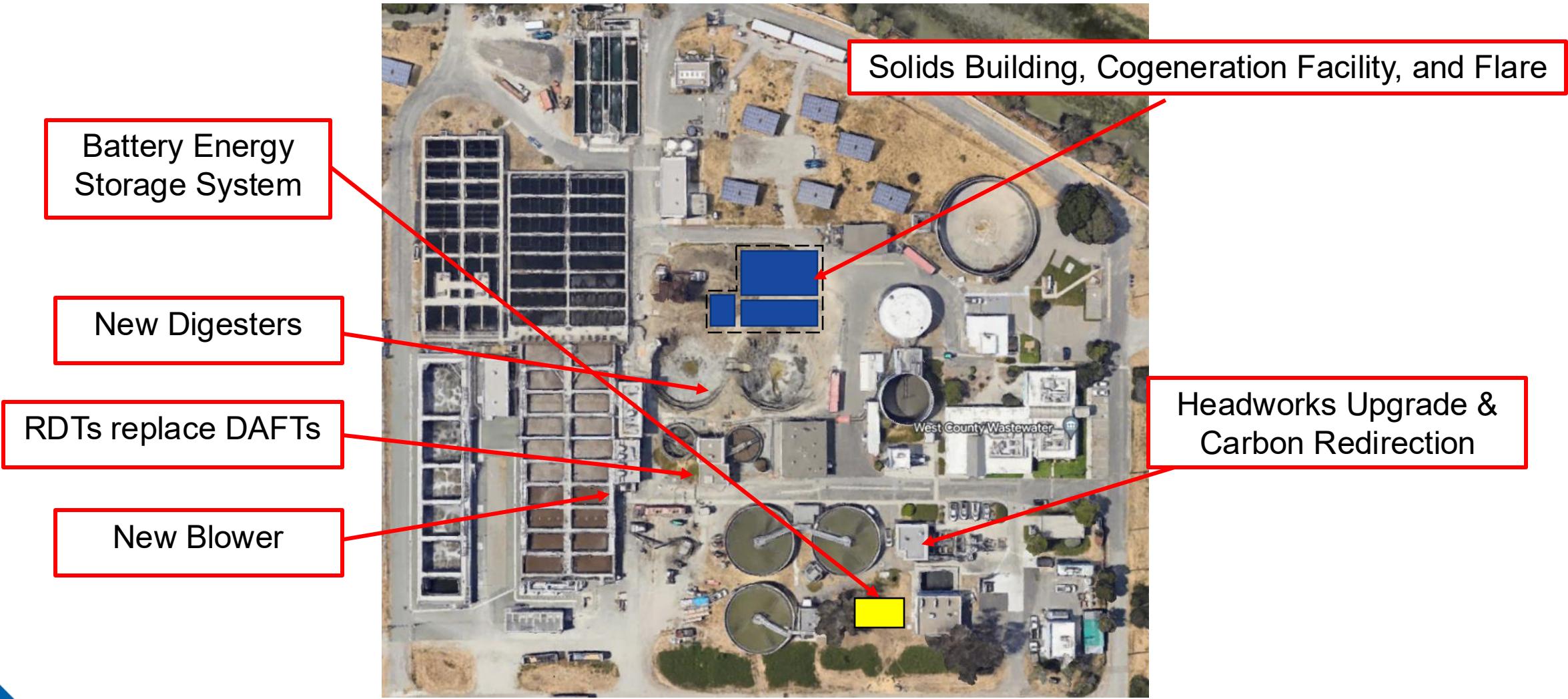


Resiliency and Outages

- ▶ Power Outages are on the rise (From 2018 – 2019):
 - Black out events increased 23%
 - Utility customers impacted by outages increased by 50%
 - Public Safety Power Shutoffs (PSPS) also increased
- ▶ Communities under pressure to adapt
- ▶ Funding for energy resiliency is available
 - Self-Generation Incentive Program (SGIP)
 - Inflation Reduction Act (IRA)



Clean & Green Project



Clean & Green WCW Team



— WEST COUNTY
WASTEWATER

CLEAN & GREEN PROJECT



OPTERRA
ENERGY SERVICES



carollo®
BLYMYER
ENGINEERS



The Process Group



WATER INFRASTRUCTURE ENGINEERS
KENWOOD ENERGY



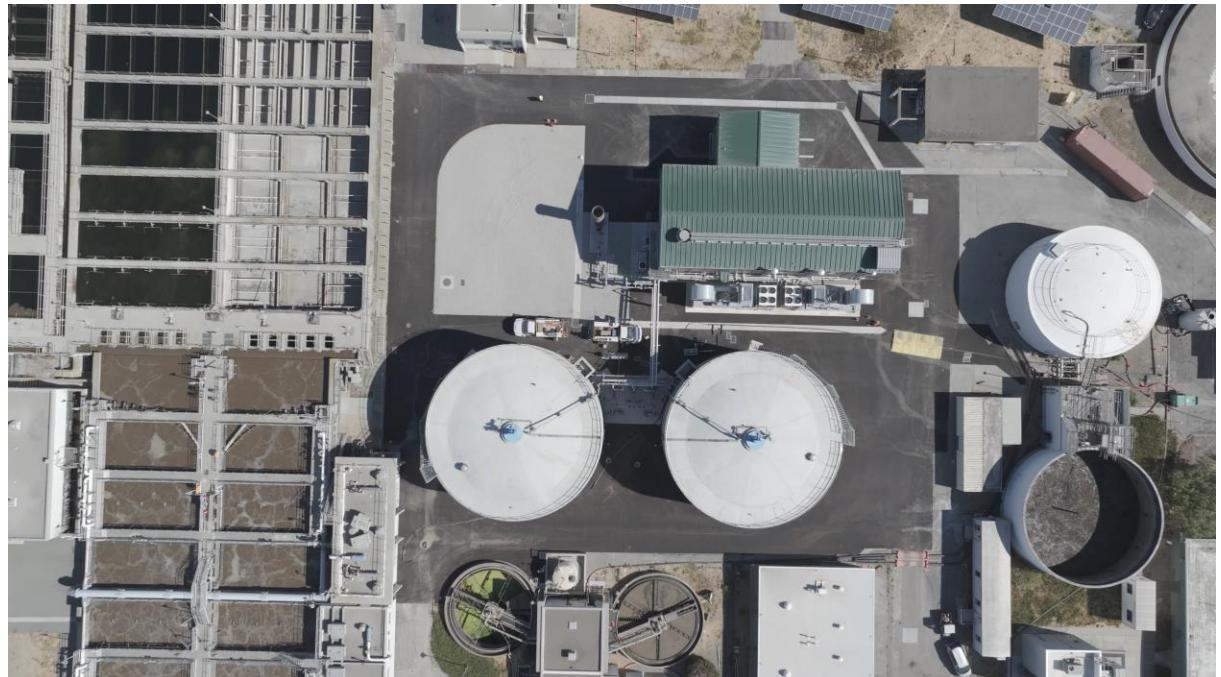
Project Benefits

- ▶ Increased power resiliency and reliability during planned/unplanned utility power outages
 - Uninterrupted plant operations
 - Less disruption for WCW O&M staff
 - Enables cogeneration and solar PV systems to operate during a power outage
- ▶ Reduction in GHG emissions (93% total reduction)
- ▶ Reduction of annual utility power cost (4.2M kWh/yr and \$83M project savings)
 - Battery will be used as energy source during peak PG&E hours to reduce PG&E energy usage/cost
- ▶ Be a community leader for sustainability and resiliency



Why is WCW Doing this?

- ▶ WCW's Comprehensive Climate Resiliency Upgrade Plan
 - Installation of linear sewer pipe to combat I&I the reducing the amount of influent at the WQRRP. (Commitment of 2 miles replaced annually)
 - Construction of the Clean and Green Project (roughly a 80-million-dollar investment into WQRRP Improvements)
 - Design, Collaboration, and Construction of the North Richmond Living Levee Project to protect the investments of WCW and its ratepayers.



New Aeration Blower Successfully Started-Up

- ▶ Increased power resiliency and reliability during planned/unplanned utility power
- ▶ New high-efficiency aeration blower:
 - Installed: 2/21/2023
 - O&M Staff Training Completed: 3/1 and 3/8/2023
 - Beneficial use: 4/19/2023
- ▶ WCW/ENGIE coordinated closely to have seamless operations during shut-downs and start-ups required
- ▶ New blower has reduced aeration energy demand by roughly 75%- \$75k/yr



Starting the blower for the first time

EQ Basin



Nov 17, 2022 at 7:44:58 AM
2123–2243 Garden Tract Rd
Richmond CA 94801
United States

Construction of New EQ Basin started in Oct 2022



Oct 2, 2023 at 1:31:40 PM
2123–2243 Garden Tract Rd
Richmond CA 94801
United States

EQ Basin Completed Oct 2023 due to heavy rains

Digesters and Solids Building



New Digesters and Solids building.



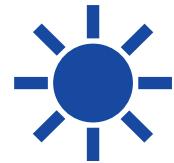
Aerial photo of Digester excavation area.

Planned Resiliency and PV



Planned resiliency facilities include:

Battery Energy Storage System (BESS)
Microgrid controller
Transformer



Proposed facilities would provide backup power to major energy facilities at the WQRRP:

New cogeneration system
New solar photovoltaic (PV)
Existing solar (PV)
Existing diesel generator



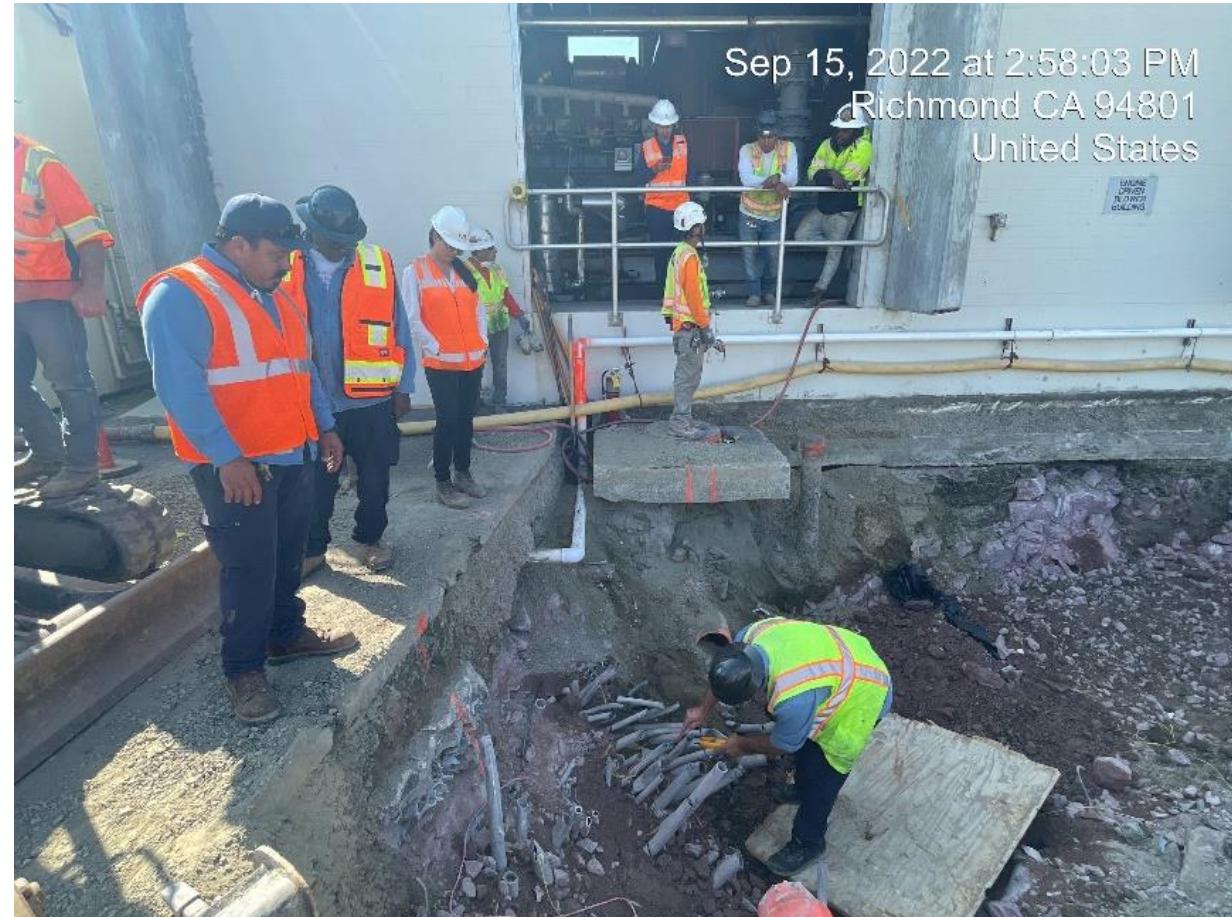
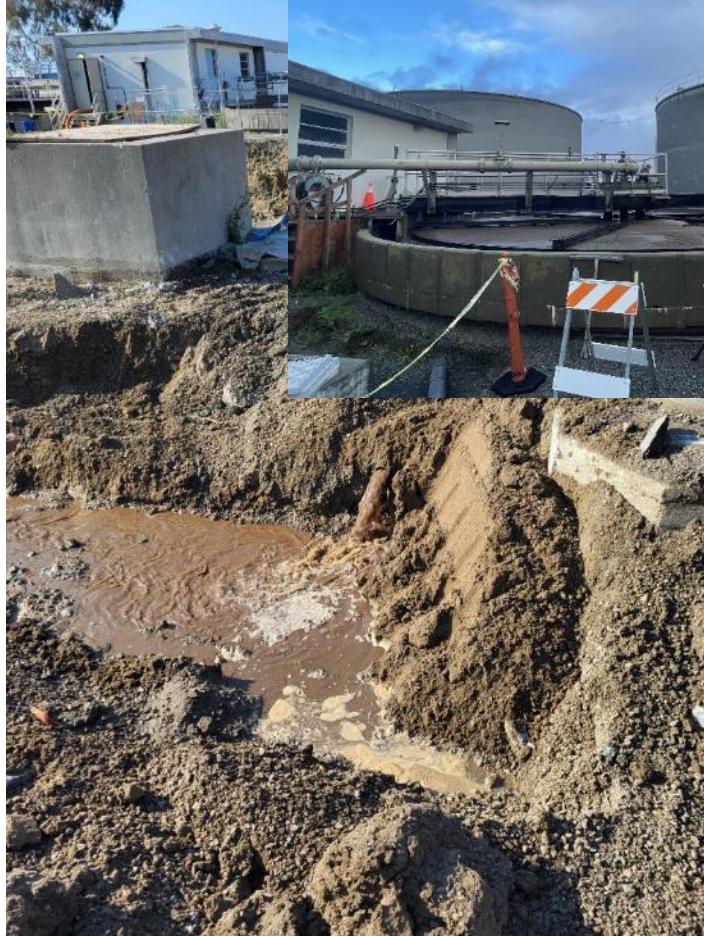
Planned Tesla Battery that will provide backup power to WQRRP facilities.

Progressive Design Build Contract Considerations

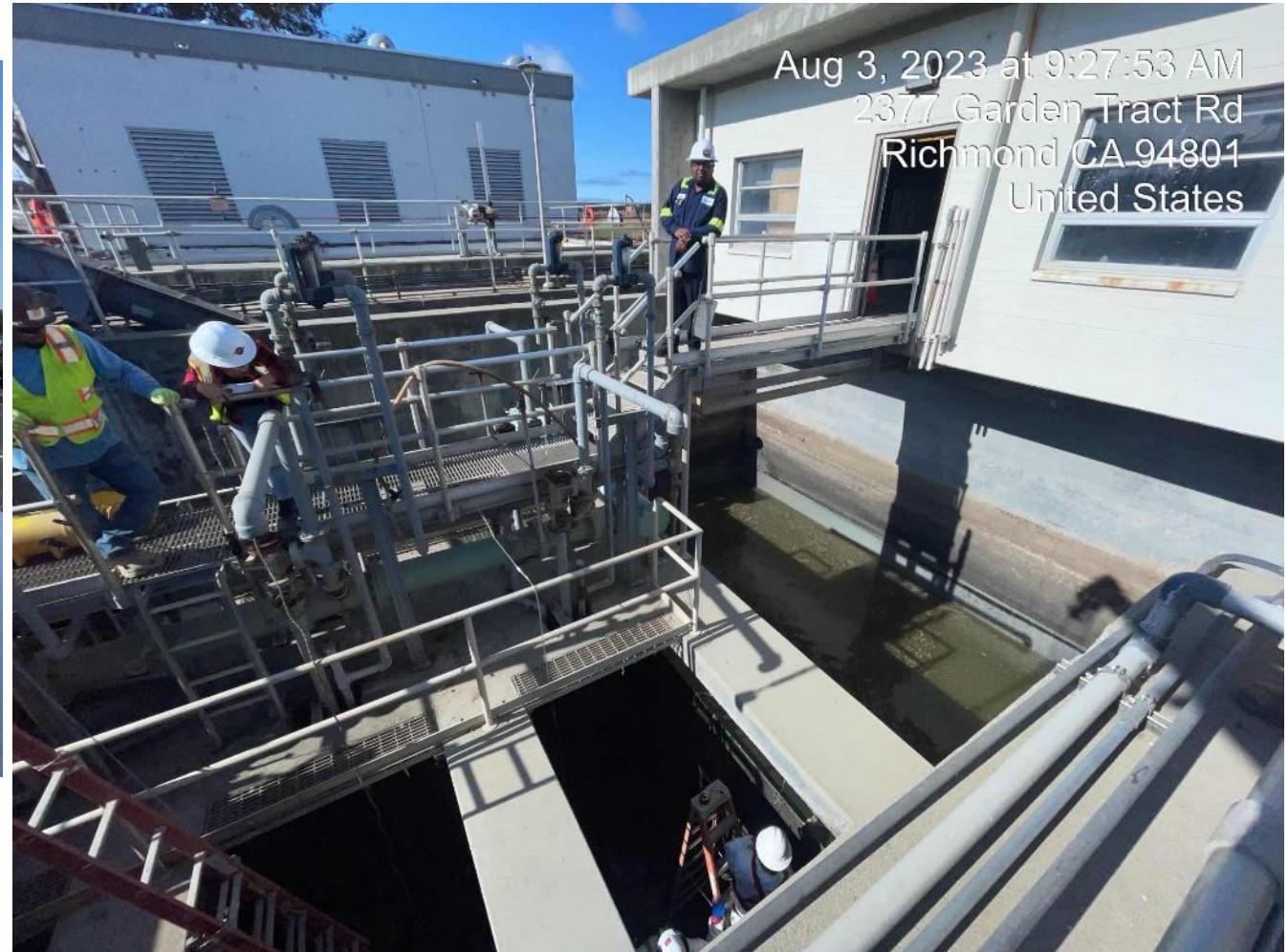
Challenges on Clean and Green Project

- ▶ Design Build with an ESCO – moving quickly
- ▶ Some construction staff have never been at wastewater treatment plant before
- ▶ Facility has many constraints including it must stay operational- maximum 12 hr shutdown coupled with 100+ year storms
- ▶ Facility has had construction for almost 70 years, so many unlabeled, abandoned and still operational pipes in the ground with nothing on the as-builts

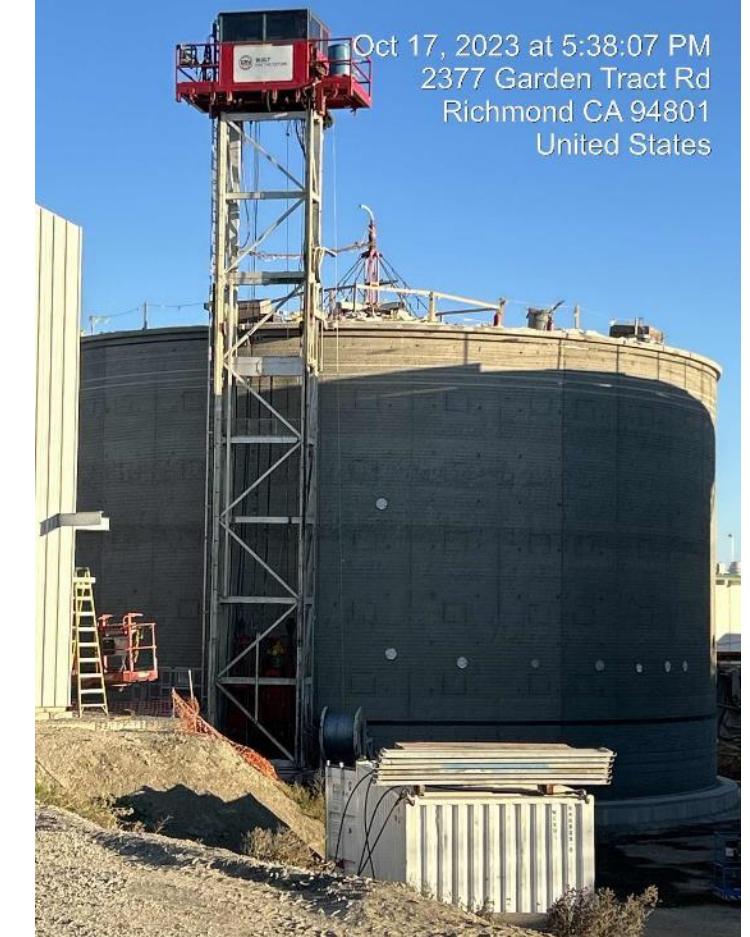
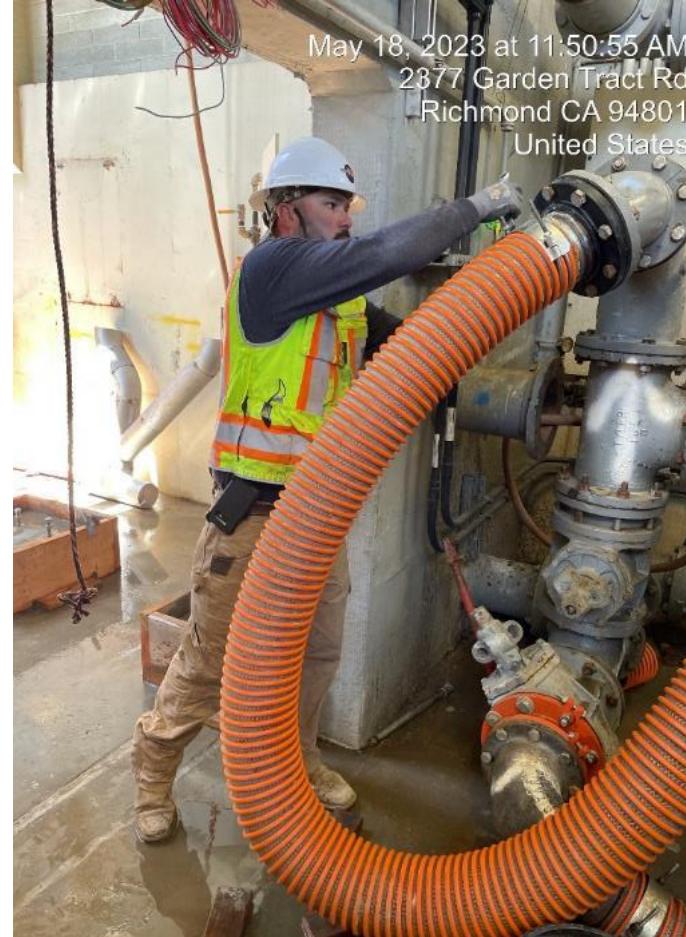
Unexpected Pipelines and Missing As-Builts



Storms and Keeping Plant Operational

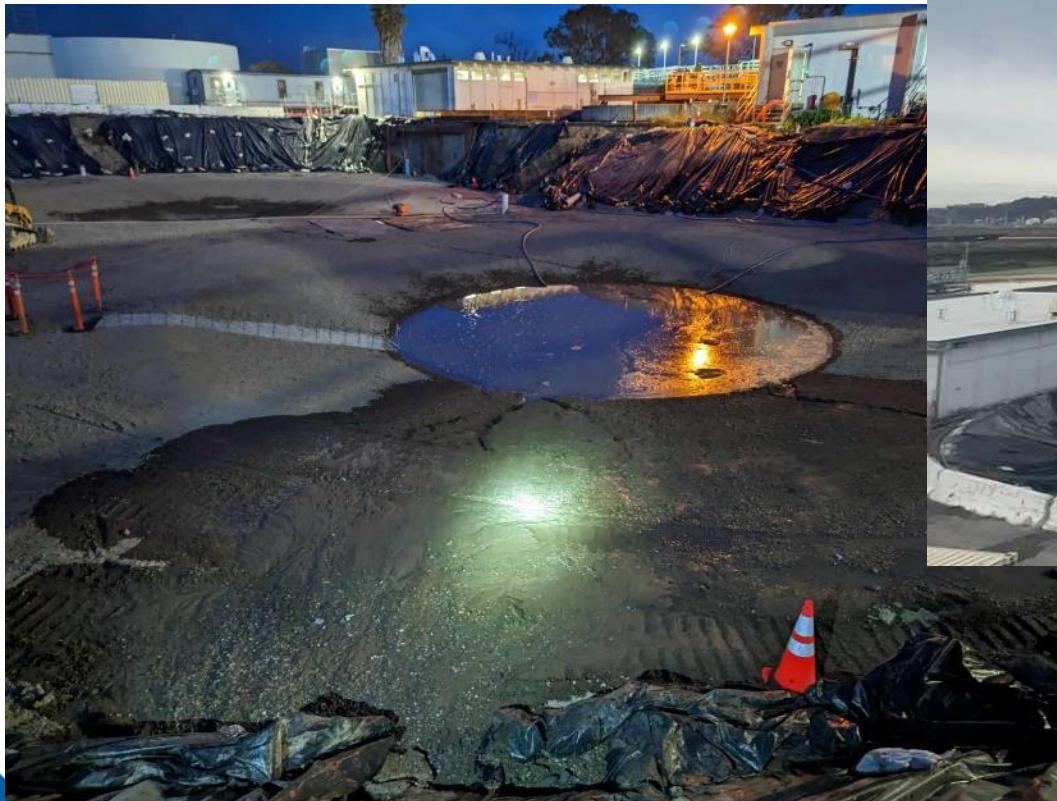


Construction Impacts Plant Operations



Plant Operations Impacts Construction

Jan 12, 2024 at 10:00:45 AM
2377 Garden Tract Rd
Richmond CA 94801
United States



Permit Impacts and Outside Agencies

- ▶ BAAQMD
- ▶ PG&E Interconnects



Communication and Coordination!!



Questions & Answers



Contact:

KReynolds@wcwd.org

Guyton.Durnin@hdrinc.com