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# Pilot Operations: Foundations, Adaptations During On-Site Operations, and Lessons Learned



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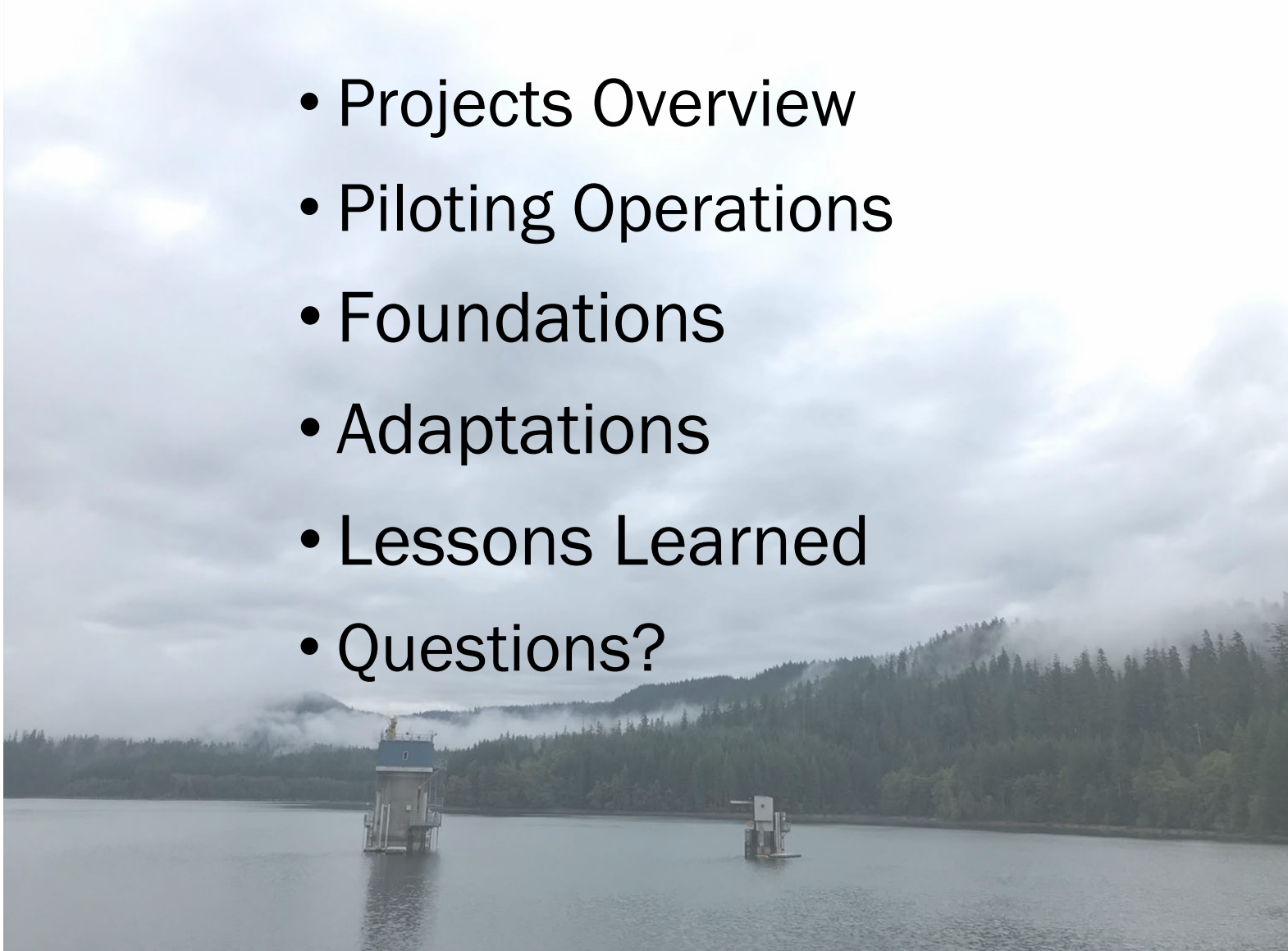
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# Agenda

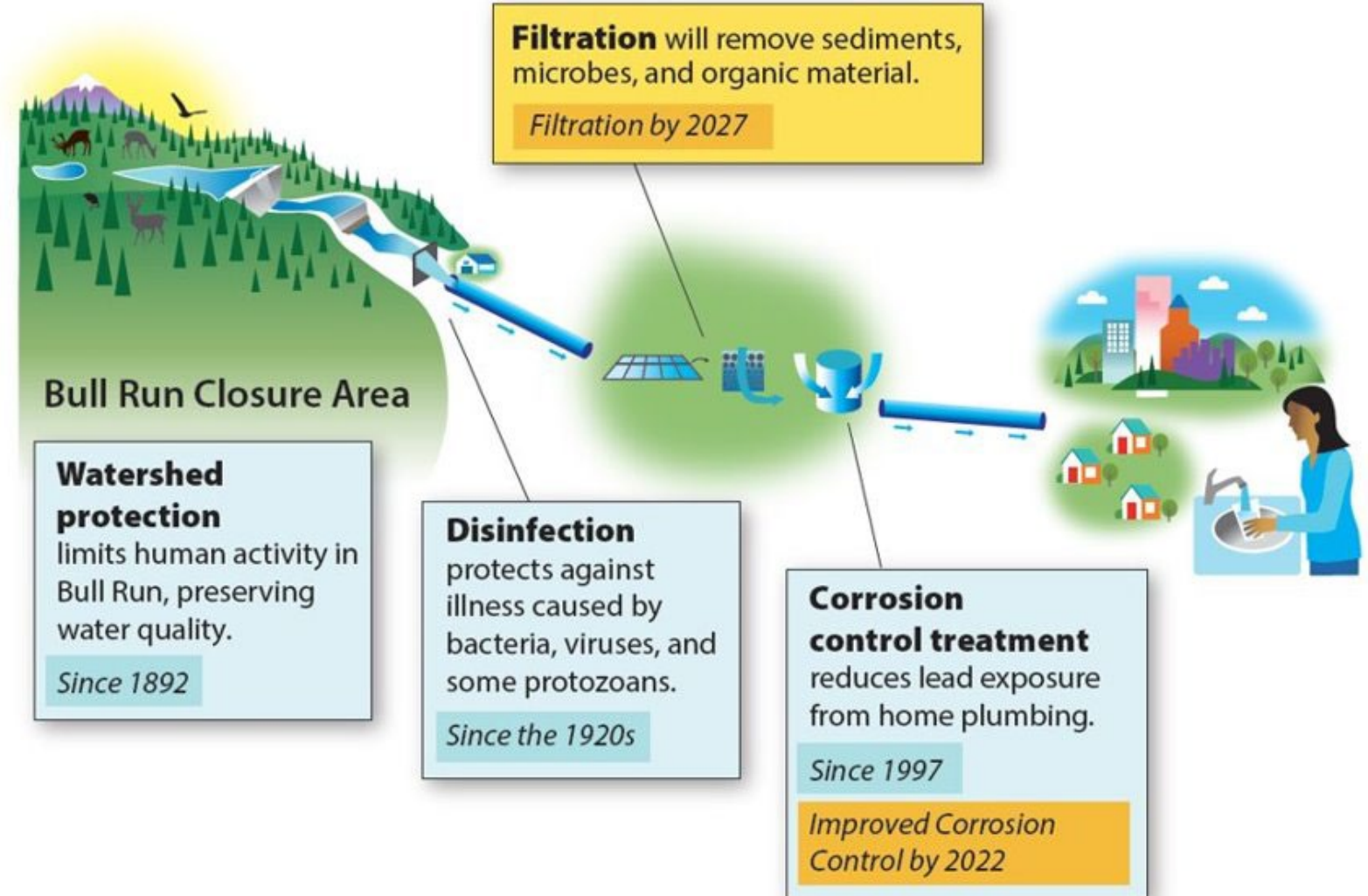
- Projects Overview
- Piloting Operations
- Foundations
- Adaptations
- Lessons Learned
- Questions?



# Projects Overview

# Bull Run Treatment Projects Overview

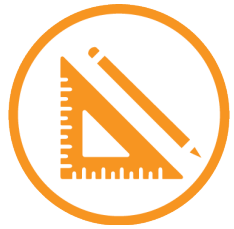
Improvements to Portland Water Bureau's system are needed to meet national drinking water standards



# Bull Run Treatment Projects Overview



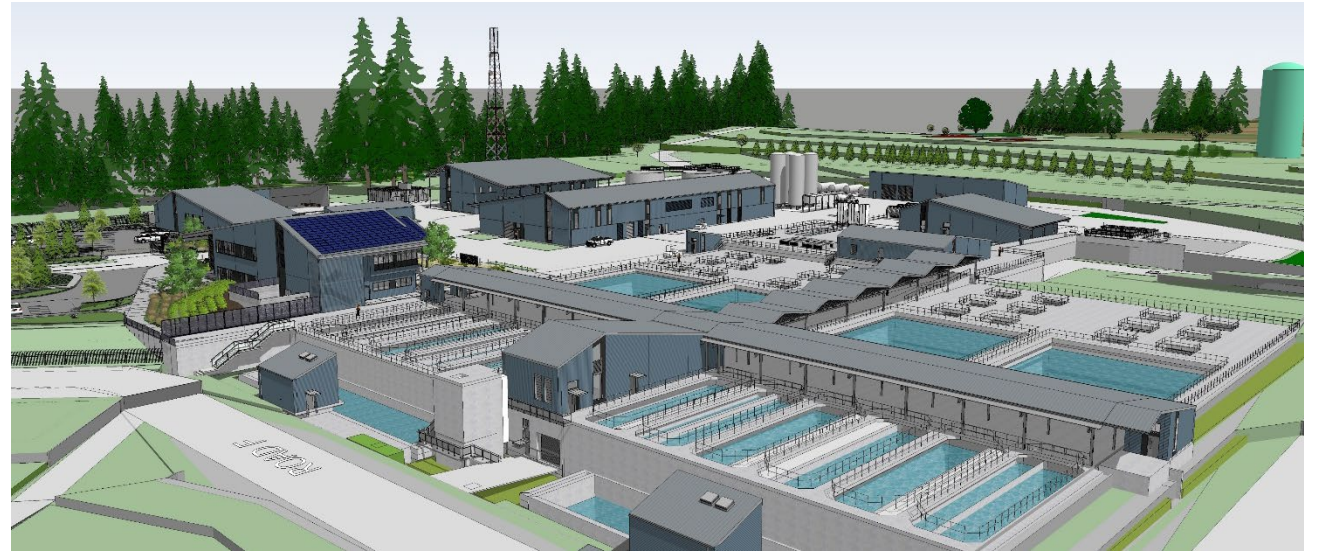
Planning Completed  
**2018-2020**



Design Underway  
**2020-2022**

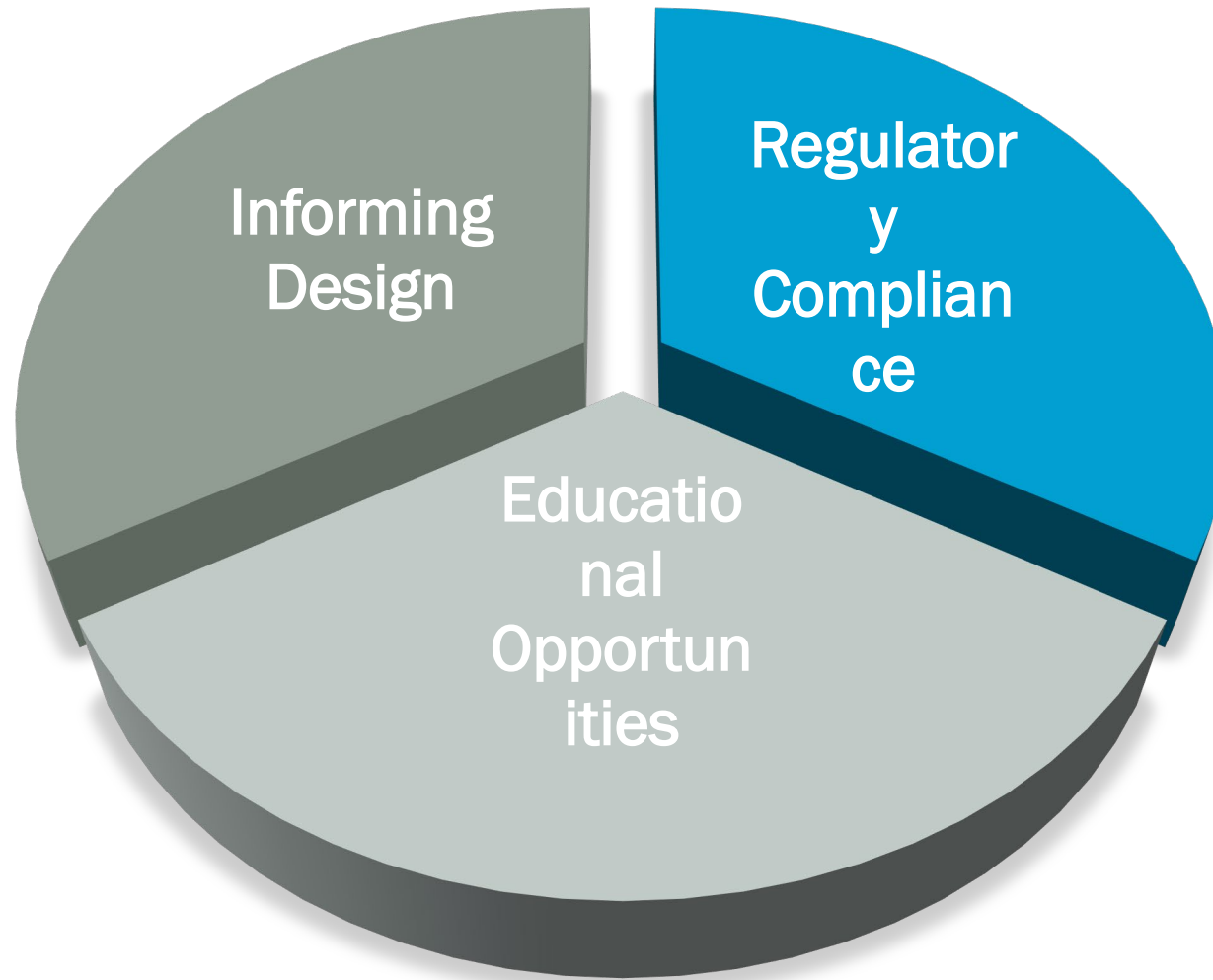


Construction Expected  
**2023-2027**





# Piloting Objectives



# Piloting Operations

# The Team

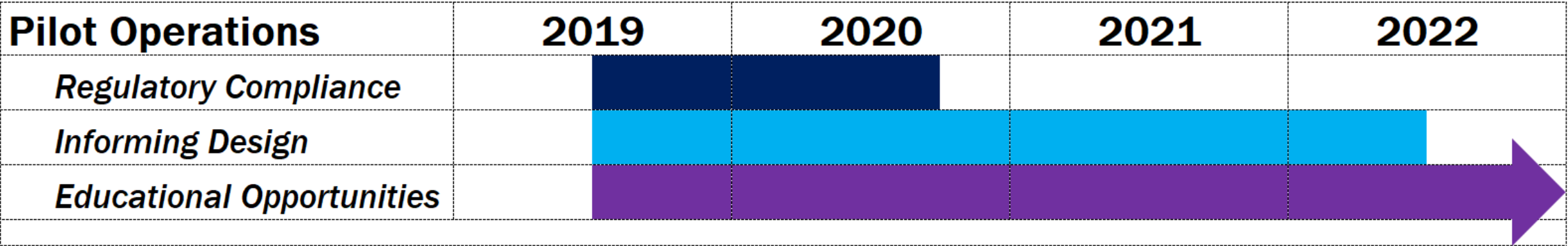




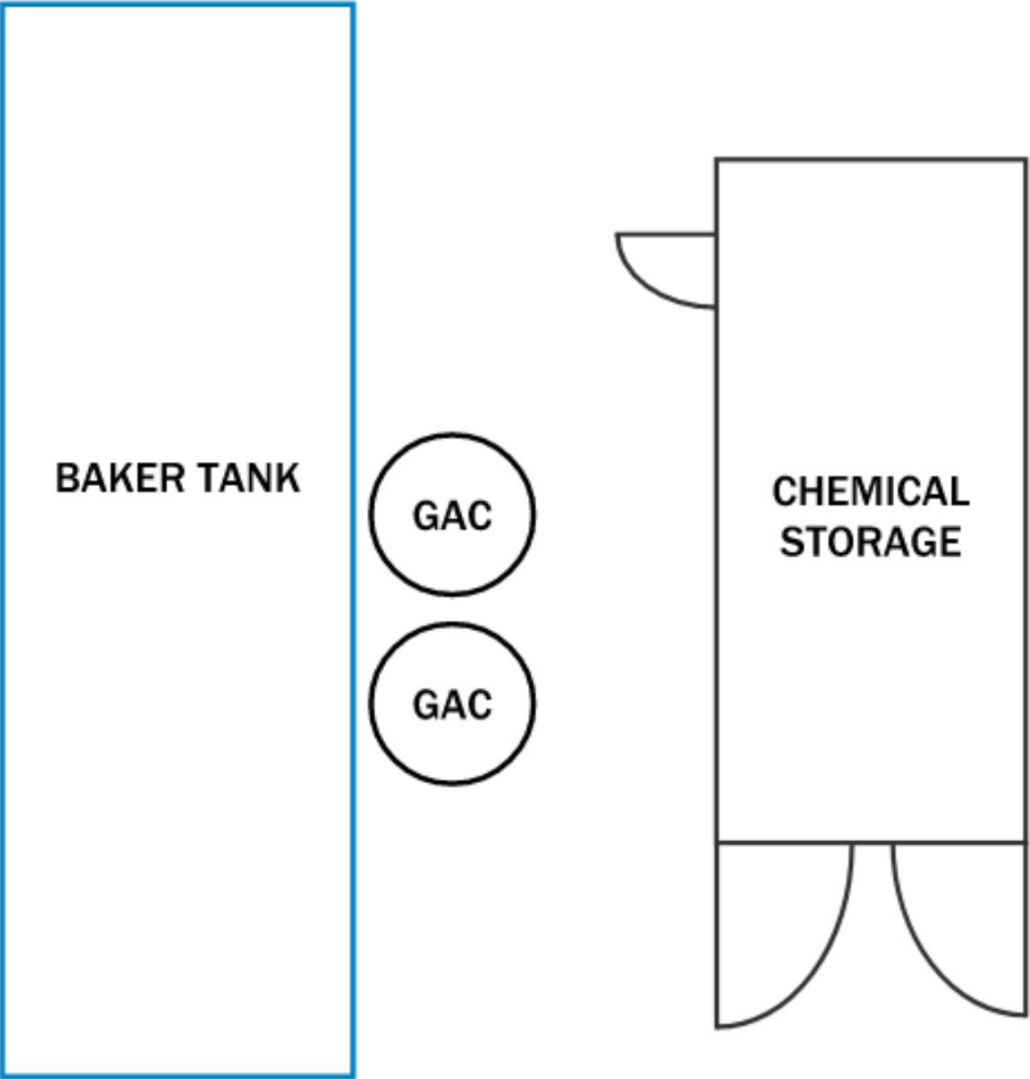
# Piloting



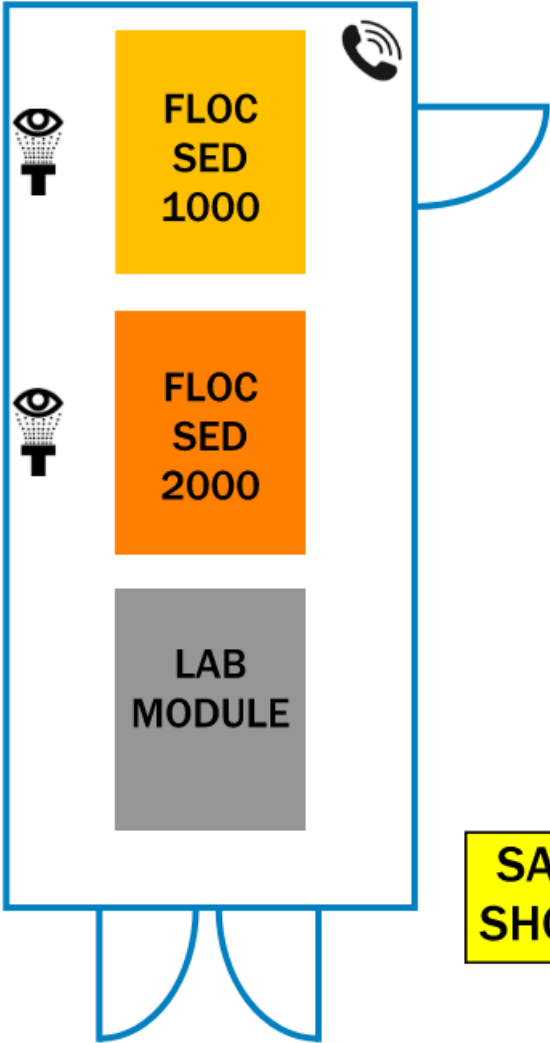
# Approaching Three Years of Continuous Operations



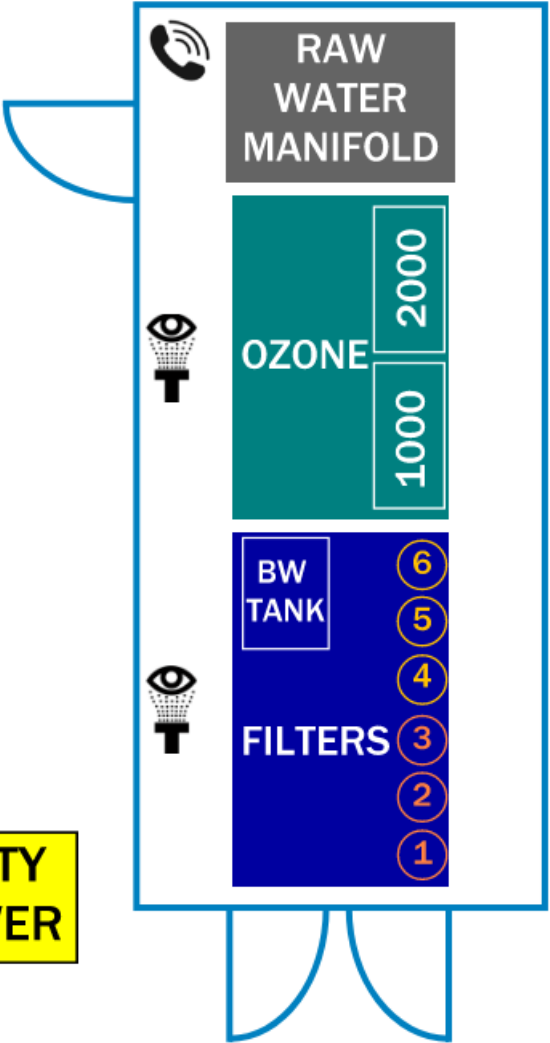
# Site Layout



Enclosure 2000

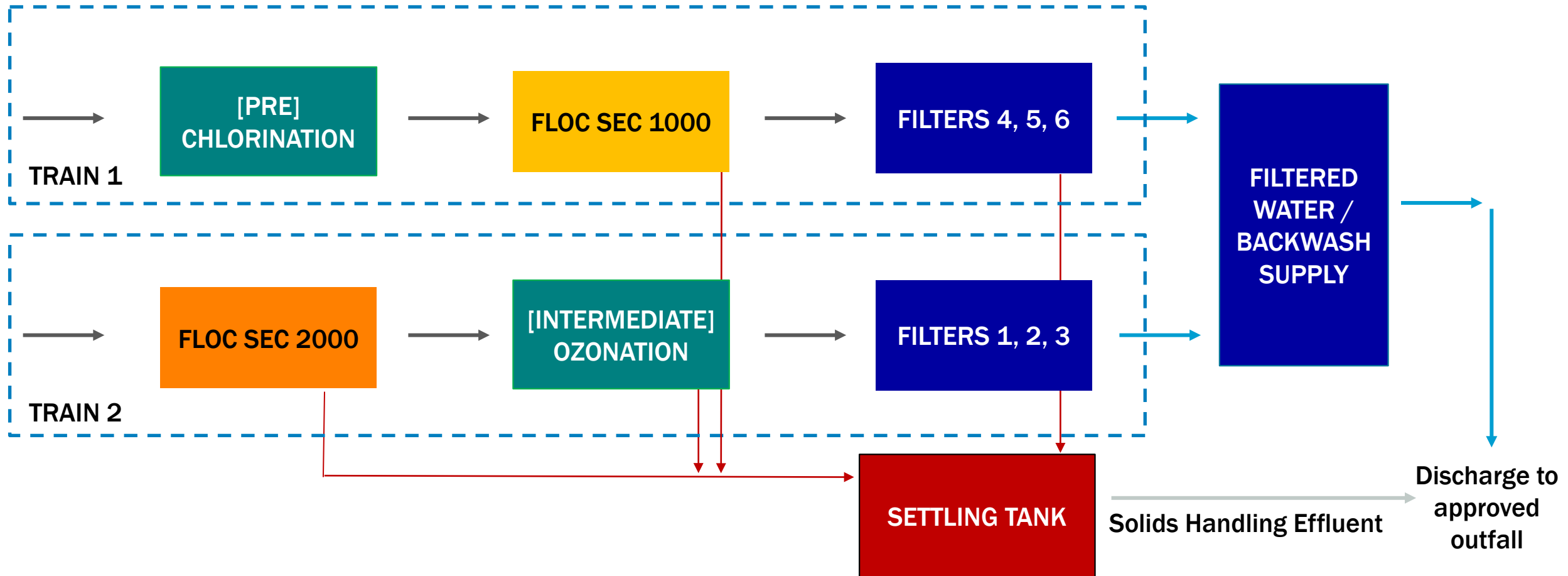


Enclosure 1000



SAFETY  
SHOWER

# Process Overview





# Train 2 Process Units

**RAW WATER  
MANIFOLD**



**FLOC SEC 2000**



**[INTERMEDIATE]  
OZONE 2000**



**FILTERS 1, 2, 3**



# Discharge



# Water Quality Sampling



# Foundations Put in Place



# Foundations Put in Place



Documentation Templates



Communication Protocols



Instrumentation and Equipment Procedures



Safety Plan



Task and Maintenance Timeline

# Laying the Foundation



# Adaptations

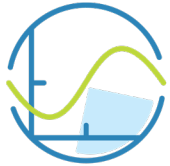
# Adaptations During Operations



Water Quality Sampling



On-site Documentation



Instrumentation



Staffing

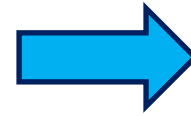


# Water Quality Sampling



## On-Site Analysis Frequency

5 days / week



3 day / week

## Lab Sampling Frequency

3 day / week



1 day / week

## Record Keeping

Paper



Electronic

# On-site Documentation



## Upload Frequency

Weekly



Daily

## Record Keeping

Paper



Electronic

# Instrumentation





# Staffing



# Lessons Learned



# Lessons Learned



- Verify Often
- Take Photos and Videos
- Make Changes
- Communicate Often



Thank you.  
**Questions?**

