



Project Updates: Booster Station & Risk Resiliency

December 8, 2020

Presentation Overview

- Review Booster Chlorination Station Project
 - Background
 - Project Components
 - Construction Timeframe
- Introduction to Risk & Resiliency project
 - Background
 - Review Project





Booster Chlorination Station

Background

- DOH required long-term Action Plan to reduce the risk of future contamination
- City needs to maintain chlorine levels that are higher than SPU purveyor systems
- Three main strategies avoid future contamination in the distribution system
 1. Maintain positive pressure at all times
 2. Maintain adequate disinfectant residuals
 3. Prevent cross connections
- City pursued design and construction of permanent system
 - Utility Board & Council Presentations
 - Project included in 2019-2020 CIP Budget



Figure 1. City of Mercer Island – Coliform Response Action Plan

(updated February, 2018)

Disinfectant Residual Increase and Maintenance

- ✓ Booster Disinfection
 - ✓ Meeting inactivation goals
 - ✓ Mixers not needed at reservoirs
 - ✓ Design for permanent system 60% complete
- Construction in 2018
- ✓ Flushing to Reduce Water Age
 - ✓ Adequate residual maintained Island-wide
- ✓ Evaluate Chlorine Demand
 - ✓ Primarily pipe walls
- Main Cleaning
 - ✓ Initial UDF trials completed
 - Additional training & UDF Q1-Q2 2018
 - ✓ Desk-top comparison of technologies
 - Ice pigging Q1 2018

Reduce Contamination Risks

- Retrofit Vaults
 - 100% of Combined PRV Vaults
 - ✓ Work completed Q2 2015
- Stand Alone Vaults
 - ✓ Inspections
 - ✓ Twice during wet season
 - ✓ All active/known vaults
 - Retrofits on-going
- ✓ Cross Connection Control Program
 - ✓ Ordinance adopted 6/15/15
 - ✓ Developed policies and procedures for program operation
 - ✓ One FTE Water Quality Tech
 - ✓ On-line test report submittal system
 - ✓ Updated and modified educational materials
 - ✓ Certification letters/surveys sent to homeowners

Operating Procedures and Documentation

- ✓ Pressure Control
 - ✓ Purchased and tested 2 high-speed data loggers
 - ✓ Tested bypass valve
 - ✓ Tested of other locations
 - ✓ Good pressure control verified
 - ✓ Verified SCADA capabilities
- ✓ Development of written SOPs
 - ✓ Joined SOP Clearinghouse and obtained templates
 - ✓ Water Quality Monitoring SOP'S
 - ✓ Water Service Assessments SOP'S
 - ✓ UDF Flushing SOP
 - ✓ Water Main Shutdown SOP'S
 - ✓ On-going: Living documents

Water Quality Monitoring

- ✓ Event Response and Transition Monitoring
 - ✓ > 2900 samples met goal
 - ✓ > 350 negative coliform samples
 - ✓ Complete Q2 2015
- ✓ Chlorine Surveys
 - ✓ Adequate residual at hydrants and dead-end locations
- ✓ Permanent TCR Plan
 - ✓ Plan approved by DOH 7/12/16
 - ✓ Sample stands installed
 - ✓ Began Q3 2015
 - ✓ Chlorine Residual Plan (Q1 2016)
- ✓ Surveillance Monitoring
 - ✓ Equipment purchase and training
 - ✓ Began June 2015
 - ✓ On-going
- ✓ On-line analyzer upgrades Q4 2015
- ✓ Installed on-line analyzer at entrance of distribution system
- ✓ Monthly CL₂ reporting to DOH

- ✓ = Complete
- = Underway

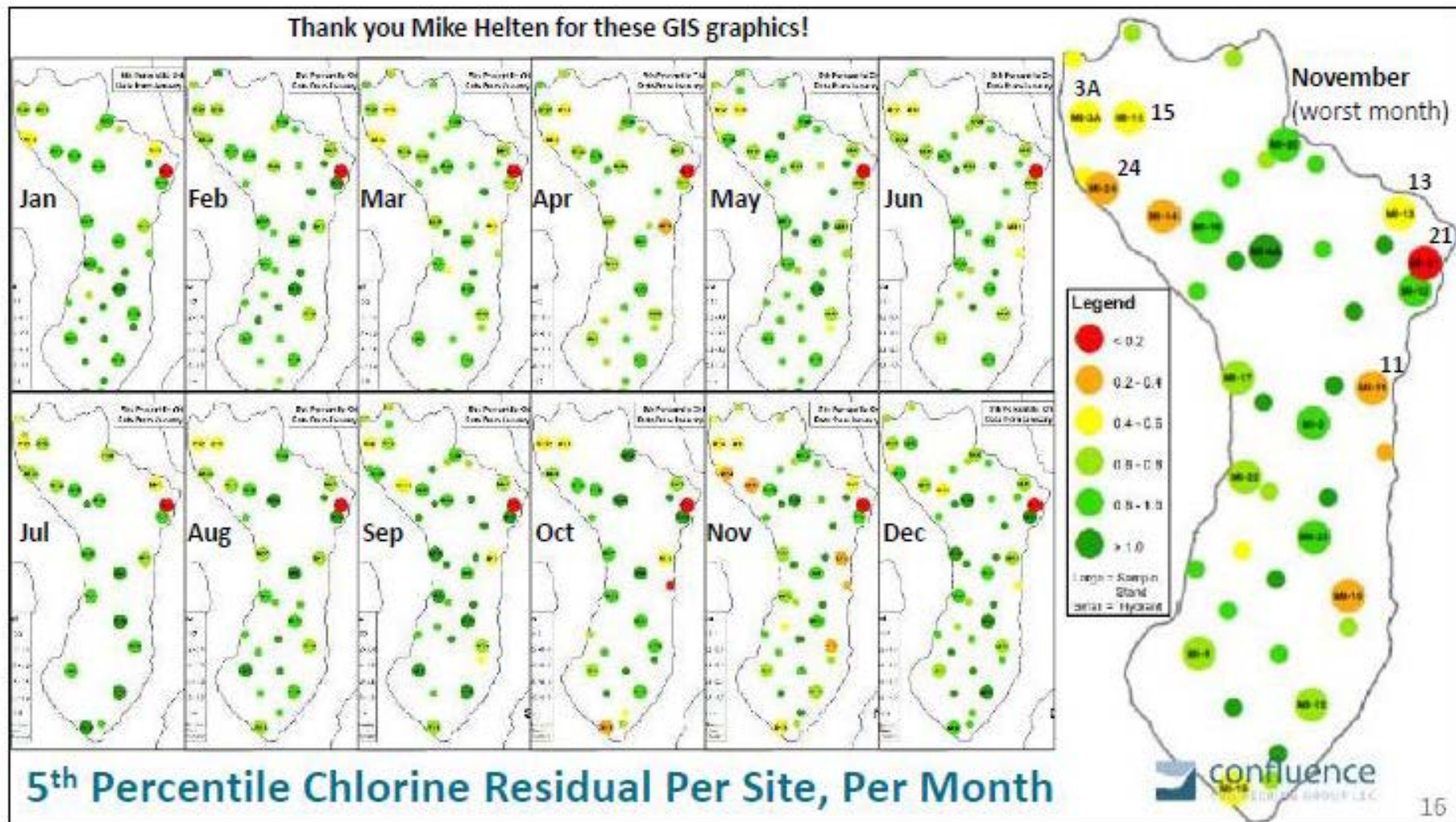


Booster CL2 Design

- In 2016, City consulted with HDR Engineering to design the new Booster Chlorination Station
- Draft Completed in December 2018
- Distribution System Complexity
 - City's chlorine residual goal is to achieve ≥ 0.6 mg/L in 95 percent of samples collected
 - City's sampling nearly tripled post Advisory Event
 - HDR's model would not provide adequate chlorine levels to the entire City



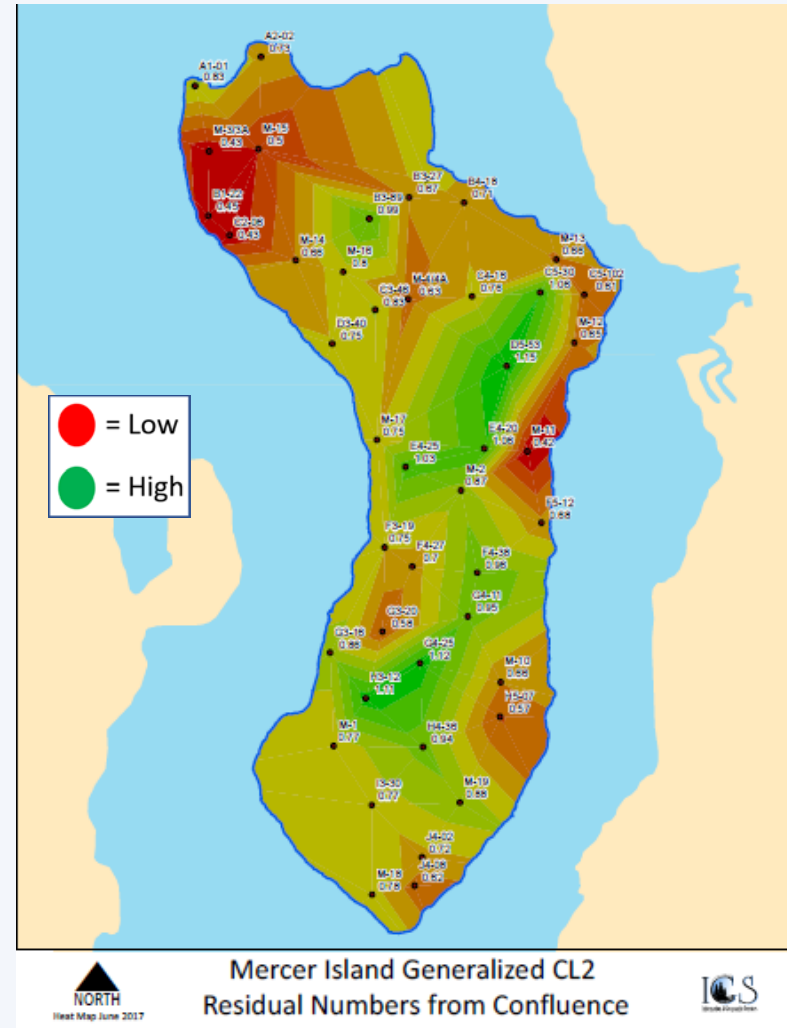
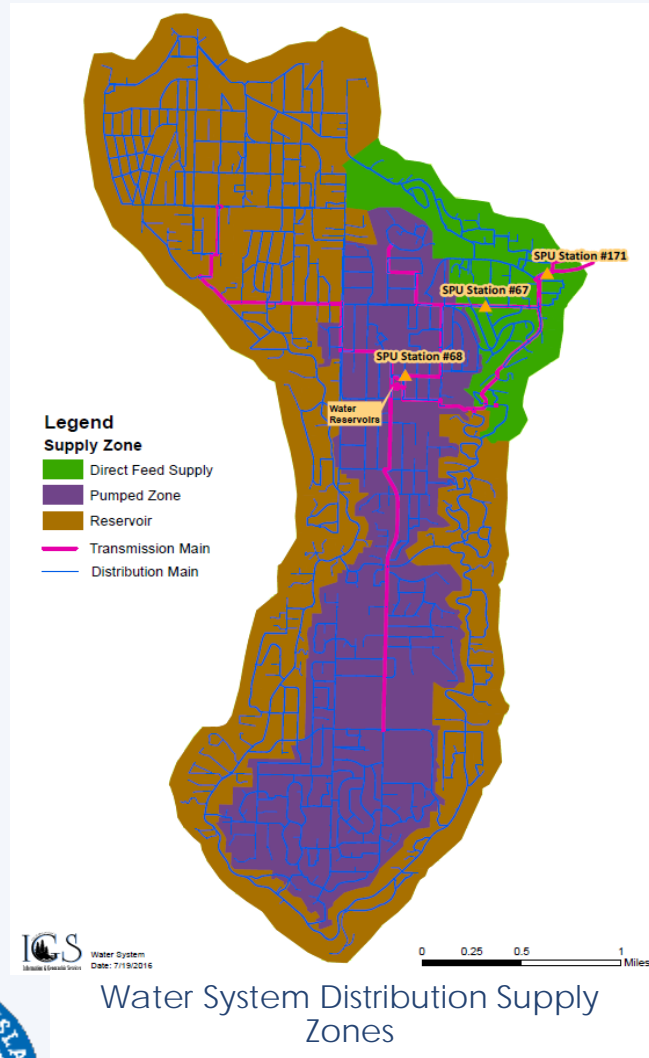
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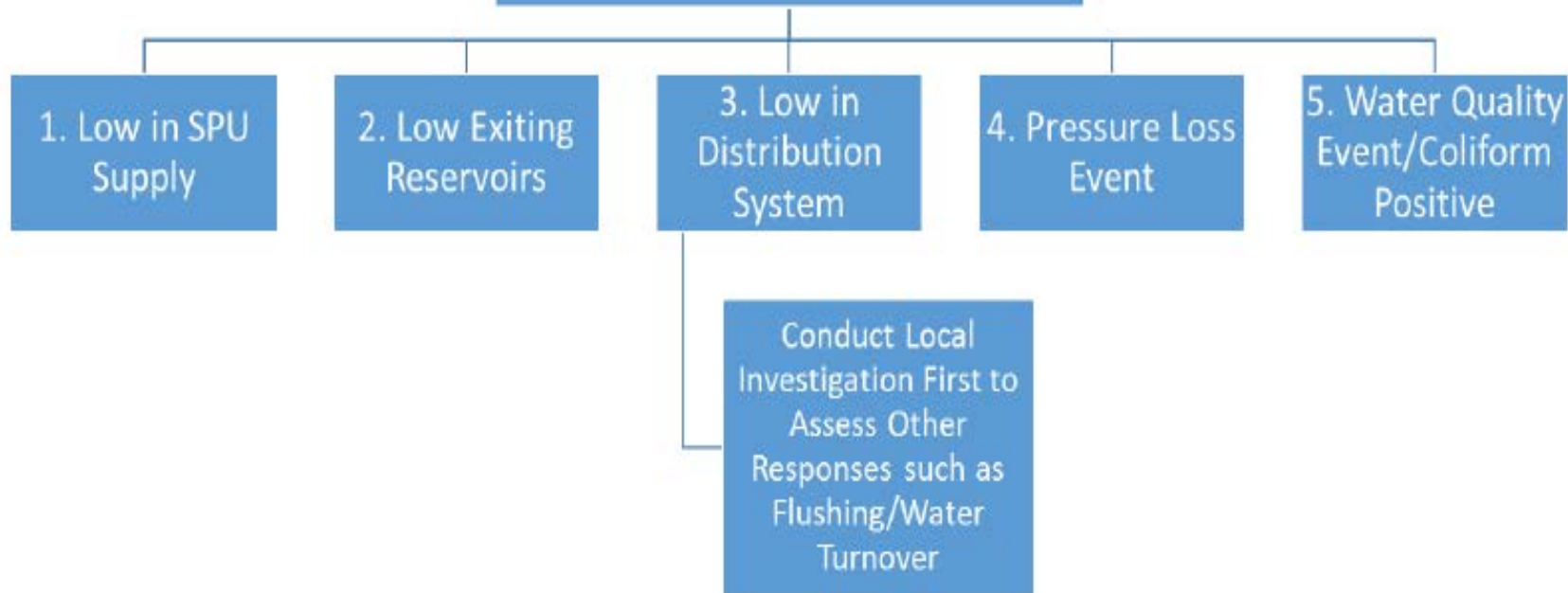
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Data Driven Decisions



Booster Disinfection Usage Scenarios



Value Engineering

- City partnered with Carollo Engineers in 2019
- Reviewed and analyzed design/operations of the proposed system from HDR
 - Recommend revised design
- Project will continue into June 2021
 - Finalize hydraulic analysis for injection and flow scenarios
 - Complete final report & design



Updated Design

- Finalizes design of a permanent booster disinfection system at City's Reservoir and Main Pump Station
- Additional tasks:
 - Modifications at SPU Meter 68
 - Decommissioning aging supply main
 - Adjust pipes to direct all flow through reservoirs
 - Add mixers at reservoirs to thoroughly mix reservoir tanks
 - Install Cl2 dosing at reservoirs



Updated Timeframe

- Project included in 2021-2022 CIP Budget
- Finished 50% design
- Final design: March 2021
- Bid project: Spring 2021
- Construction begins: Summer 2021

Questions?





Risk and Resilience Assessment & Emergency Response Plan

Background

- On October 23, 2018, Congress signed the America's Water Infrastructure Act (AWIA)
 - Builds on 2002 Safe Drinking Water Act
- Requires City to conduct a Risk and Resilience Assessment (RRA) of community's water system and prepare a corresponding Emergency Response Plan (ERP)
 - Upon completing each task, City needs to self-certify with the EPA informing that it complies with AWIA
- City will need to update the RRA every 5 years



Project Requirements

City solicited RFQ Summer 2020

1. Risk & Resiliency Assessment

Assess City's water system infrastructure and overall system operations, including hazards

Deadline for RRA: June 30, 2021

2. Emergency Response Plan

Develop strategies, recommendations, and other actions the City can implement to improve water system resiliency, reduce risks, and mitigate impacts from hazards

Deadline for ERP: December 31, 2021



Scope

RRA

- Characterize assets and threats
- Analyze consequences, vulnerability, threats, and risk/resilience
- Manage risk and resilience

ERP

- Review existing ERP from 2002 act
- Incorporate new hazard and risk updates
- Mitigation activities
- Update response procedures
- Train staff on ERP





Questions?