



PORTLAND WATER BUREAU: Water Quality Update

Portland City Council Work Session
October 11, 2016

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Presentation Outline

- Introduction
- System Overview
- Why Now?
- Portland's Compliance History
- Lead Hazard Reduction Program
- Our Work with Community Partners
- Water Quality Corrosion Study
- Next Steps

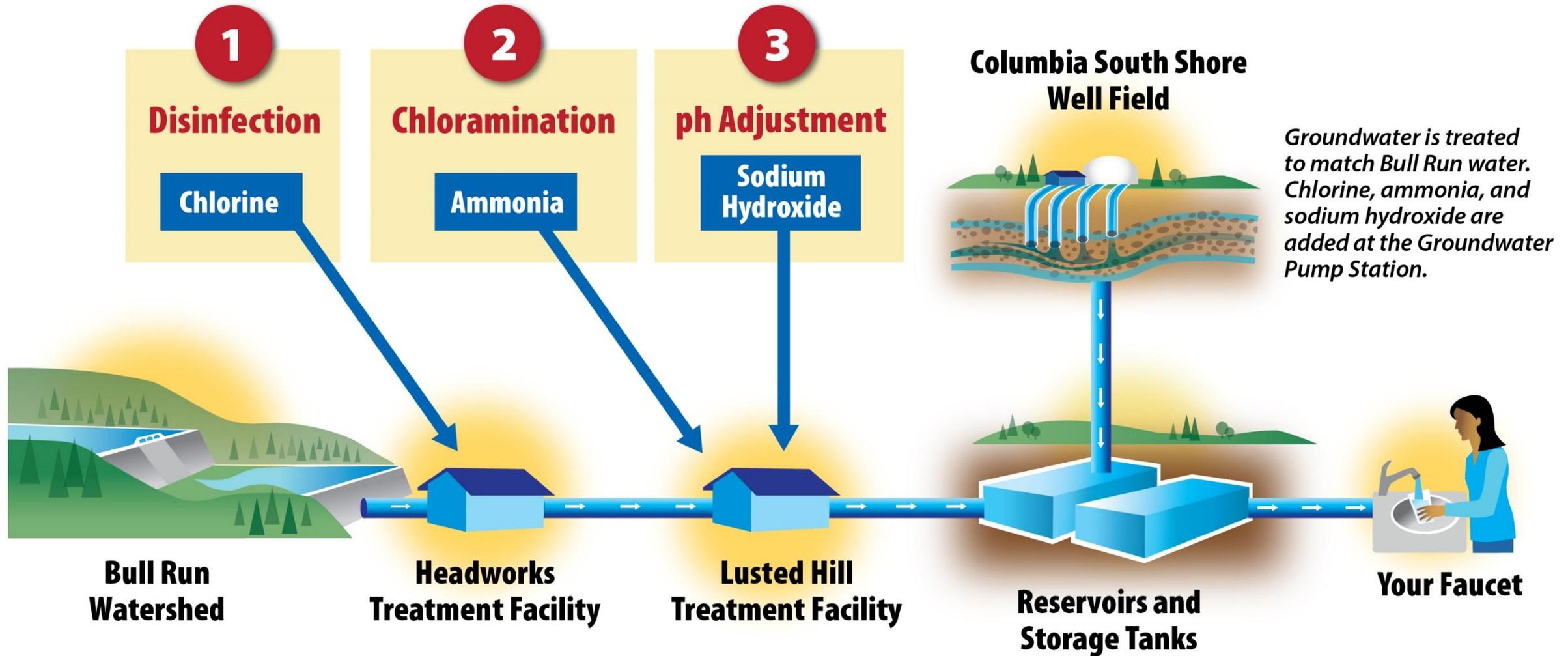
Service Area and Water Sources



- | | | | |
|--|--------------------------|---|---|
|  | Water Storage Facility |  | Portland Water System Distribution Area |
|  | Water Supply Pipes |  | Water Source |
|  | Water Treatment Facility |  | Protected Area |
|  | Dam | | |

- 588,000 retail customers
- 370,400 wholesale customers
- 19 wholesale water districts
- 101 million gallons per day average

Supply System Overview



Water Quality Report

- Monitor for more than 200 regulated and unregulated contaminants in drinking water
- Collect and analyze over 11,000 samples each year
- Annual Report contains information about our water



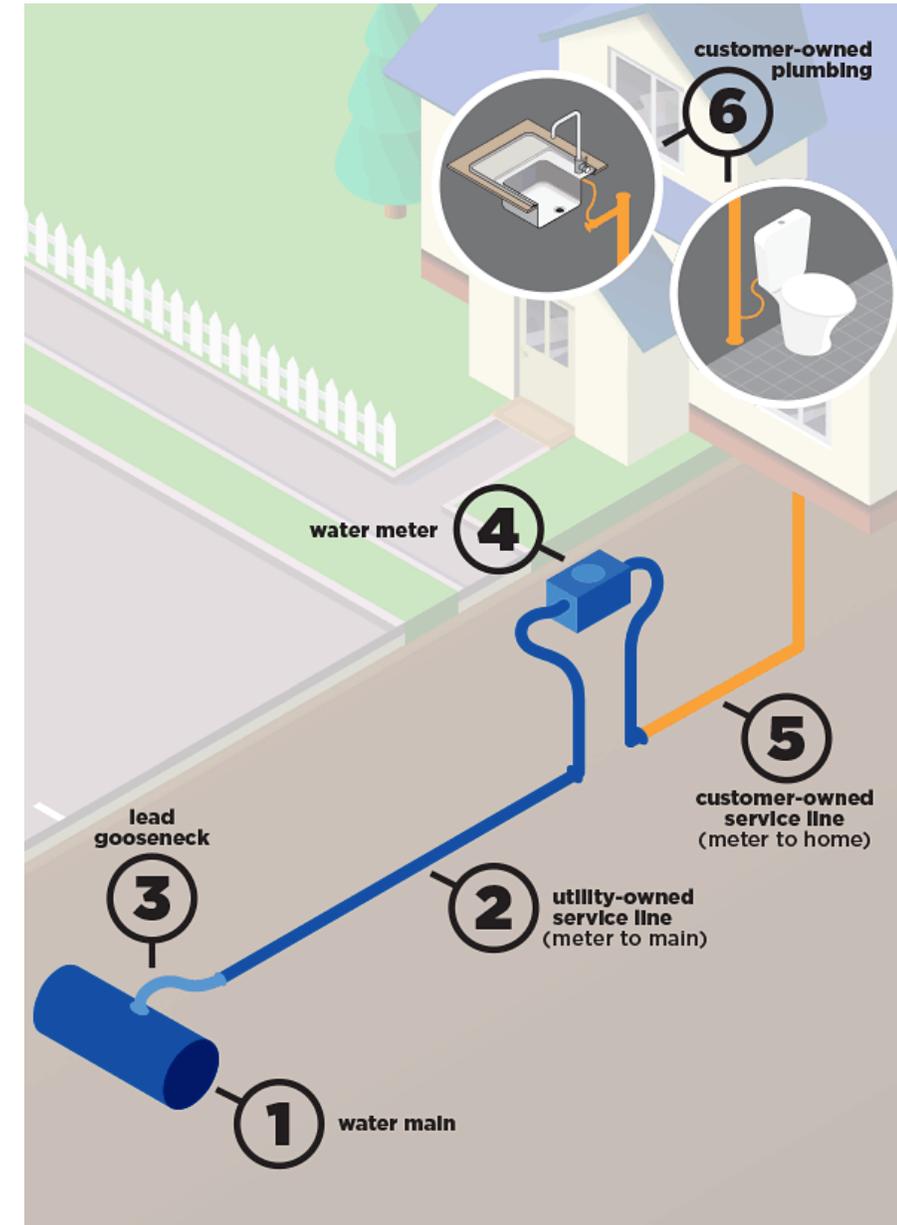
PORTLAND WATER BUREAU

2016 Drinking Water
Quality Report



Water Quality Overview

- In compliance with all state and federal regulations, including the Lead and Copper Rule
- Portland has never used lead service lines and does not have lead pipes in our distribution system
- Removed all known lead pigtails/goosenecks



Environmental Exposure

- Copper pipes and lead solder - most common in homes plumbed or built from 1970 – 1985 (banned by Oregon in 1985)
- Home plumbing fixtures installed prior to 1985 can also contribute to lead in water (limited by Oregon in 1985, reduced significantly by Congress in 2014)
- In Portland lead paint is the greatest source of exposure to lead (banned by Congress in 1978)



Water System Improvements

- Solder
 - Worked with Oregon to ban lead-based solder in water systems in 1985
- Pigtails
 - Removed all known lead pigtails (>10,000) in the distribution system by 1998
- Meters
 - Replaced 364 large lead-component meters serving schools, hospitals, childcare facilities, community centers, public housing, and large apartment buildings from 2001-2008.



Compliance History

- EPA enacts Lead and Copper Rule, requires corrosion control in public water systems (1992)
- City develops a comprehensive approach; State approves program as optimized treatment (1997)
- Technical Advisory Committee recommends long-term water chemistry changes (2002)
- Water Bureau begins Water Quality Corrosion Study (2014)

Lead Hazard Reduction Program

- State Approved Compliance Program (1997)
- 4-part program meets federal regulatory requirements

Water Treatment & Monitoring



Education & Testing



Public Education & Community Outreach

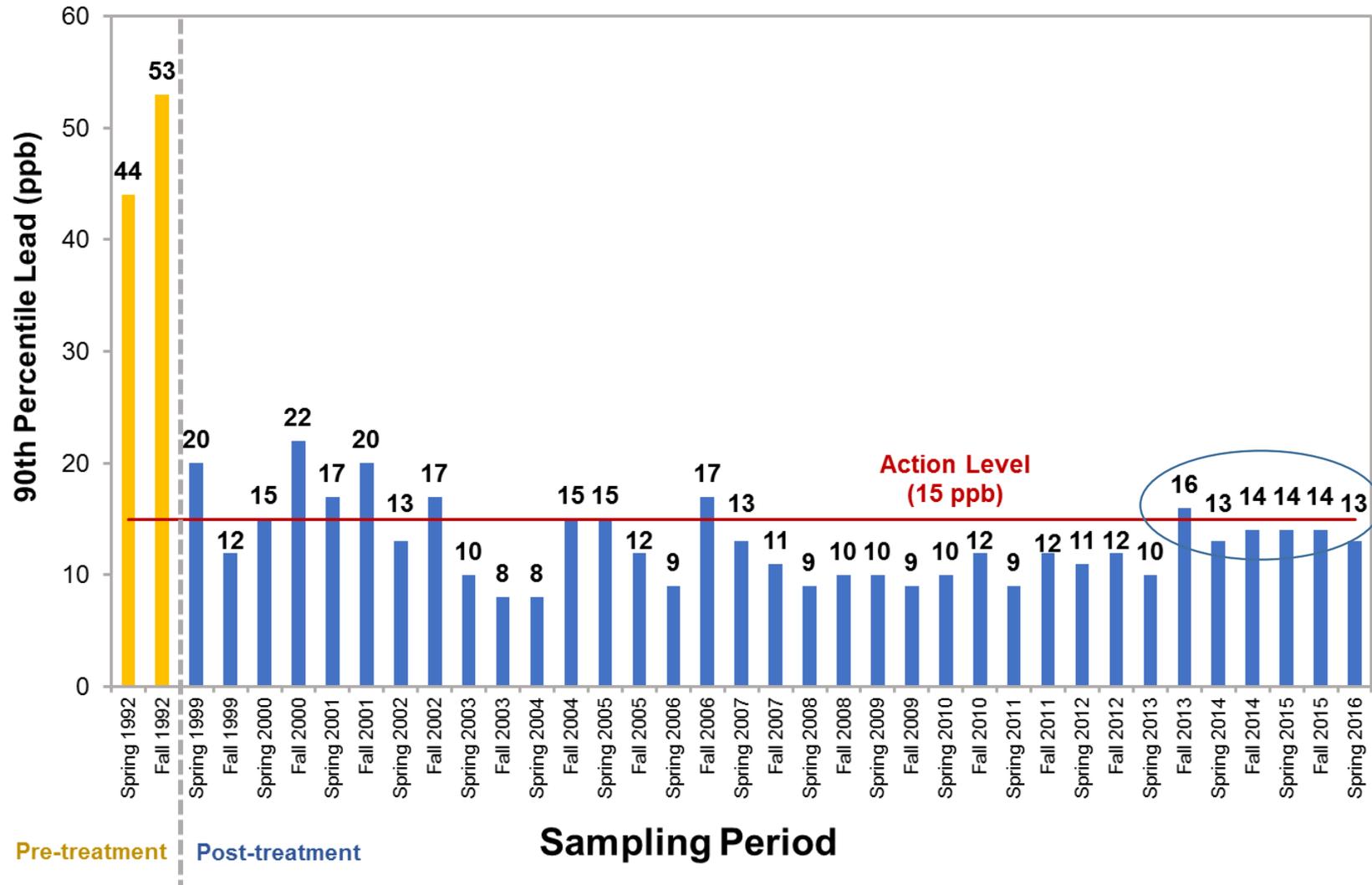


Lead Paint Removal Grants



Sampling History

Portland Joint Monitoring 90th Percentile Lead Levels

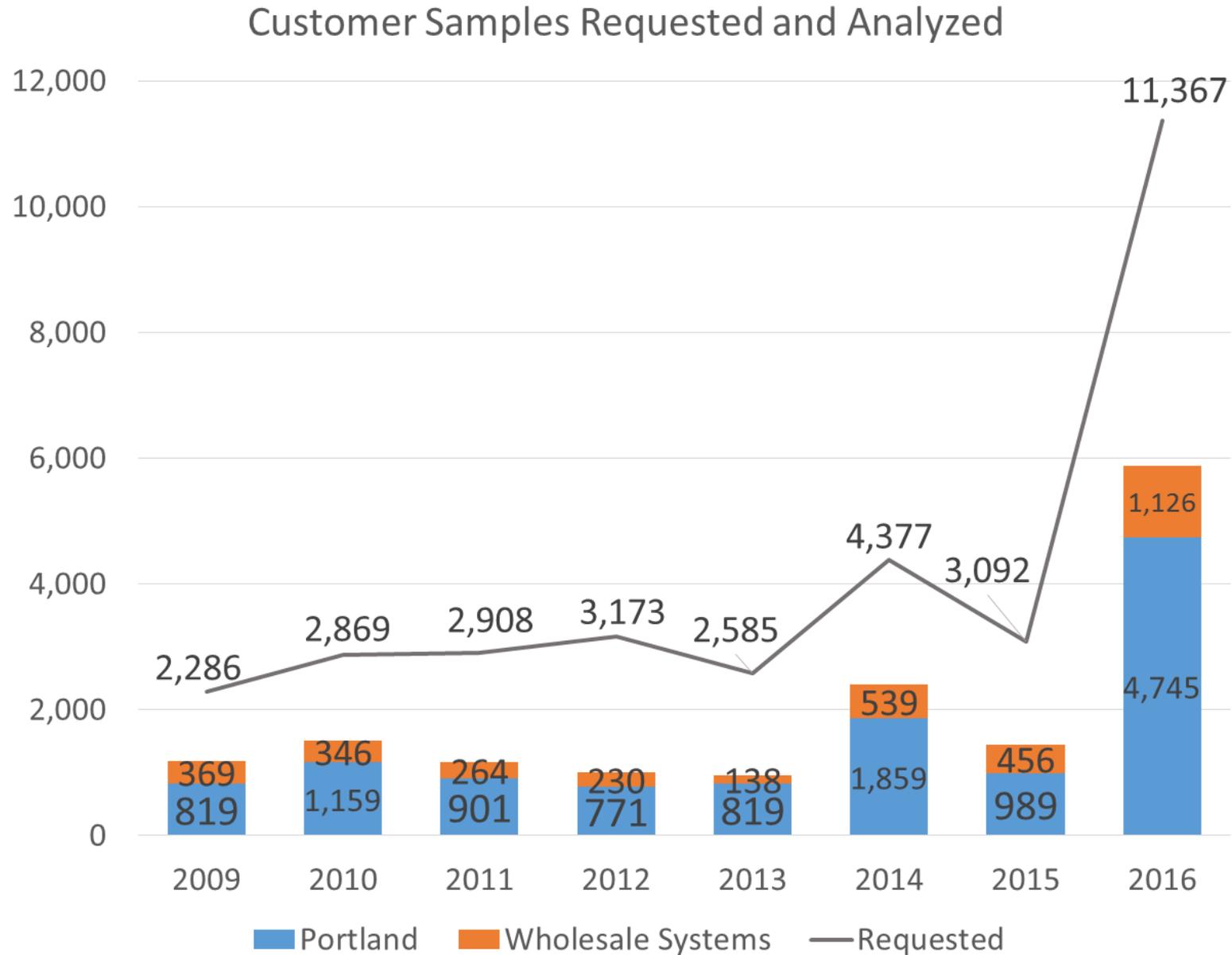


What is an Action Level Exceedance?

- Action level is measurement of treatment effectiveness
 - not a violation
- Actions to take with an exceedance (within 60 days):
 - Notify public
 - Notify sensitive populations
 - Test source water



Education & Testing



Community Partners: Schools

Portland Public Schools (PPS)

- Provided analysis of 1,814 samples from PPS
- Offering assistance in follow-up testing

Other Schools

- Offered technical assistance and free sample analysis to all public and private schools in PWB service area



Community Partners: Daycares

In-home daycares

- 612 emails and letters sent
- Offered free lead-in-water test kit

Daycare centers

- 261 emails and letters sent
- Offered analysis and technical assistance in sampling per EPA's guidance



Community Partners: City Facilities

Prioritized sites based on:

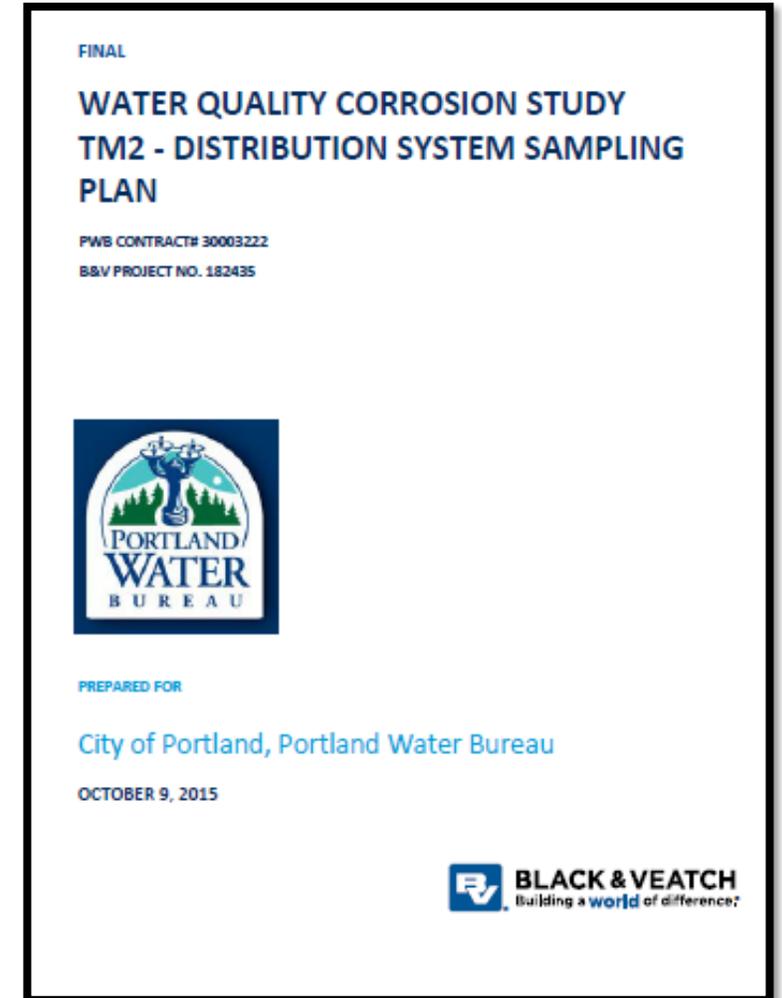
1. Primarily serve infants, children, pregnant women
2. Primarily serve the public
3. Built or plumbed before 1985
4. All other

More than 750 facilities, requiring up to 2 years to test



Water Quality Corrosion Study

- Authorized by Council in 2014
- Data gathering over entire year to see seasonal variations (Nov. 2015 – Jan. 2017)
- Goal is to better understand the role of water quality on release of metals
- Panel of utility, consultant, and academic experts are assisting
- This is not a treatment study
 - Any significant changes to treatment would require pilot testing and Council approval



Corrosion Study: What are we testing?

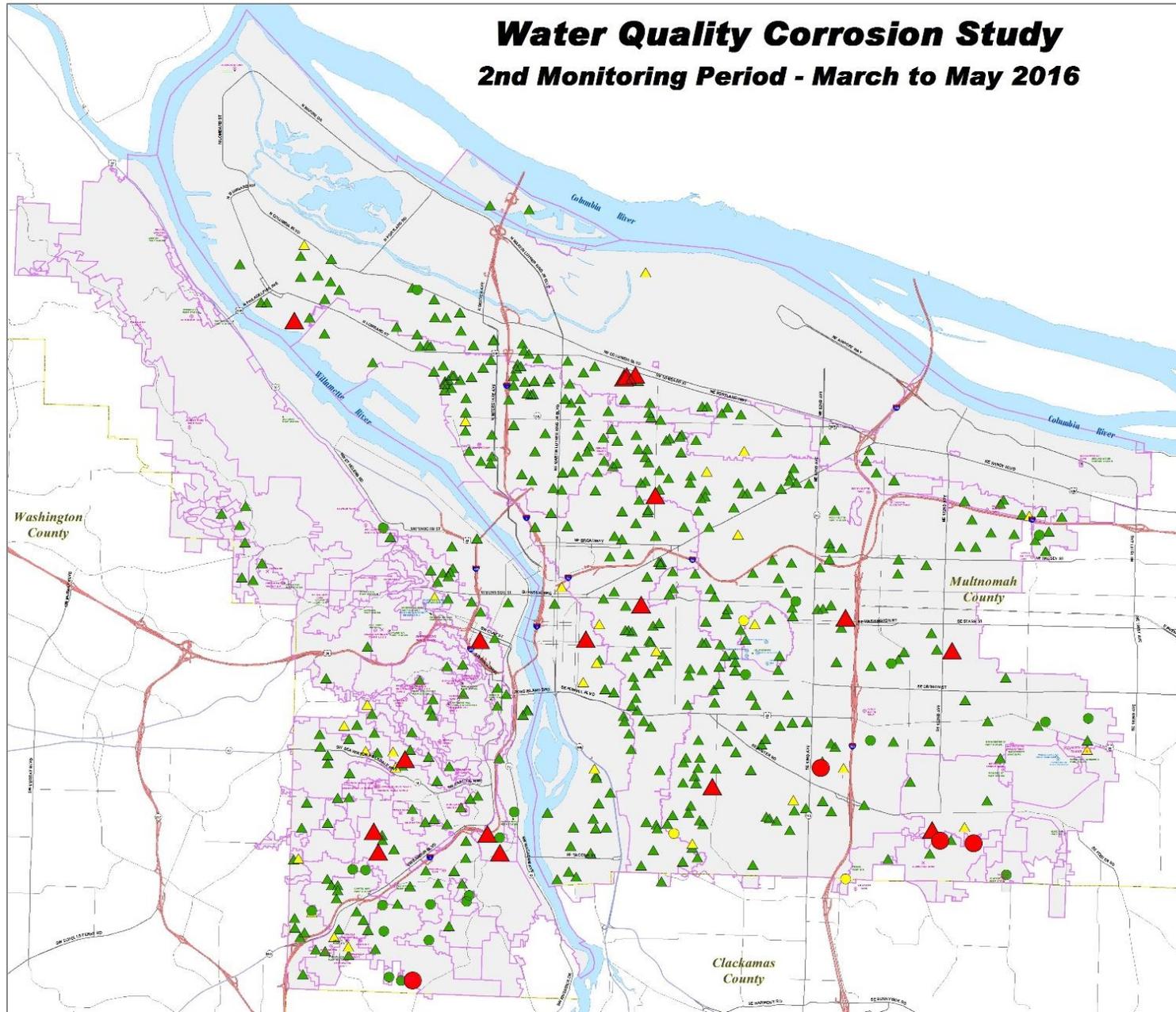
Field

- pH
- Temperature
- ORP
- Chlorine residual
- Monochloramine
- Free ammonia
- Turbidity
- Conductivity
- ATP

Lab

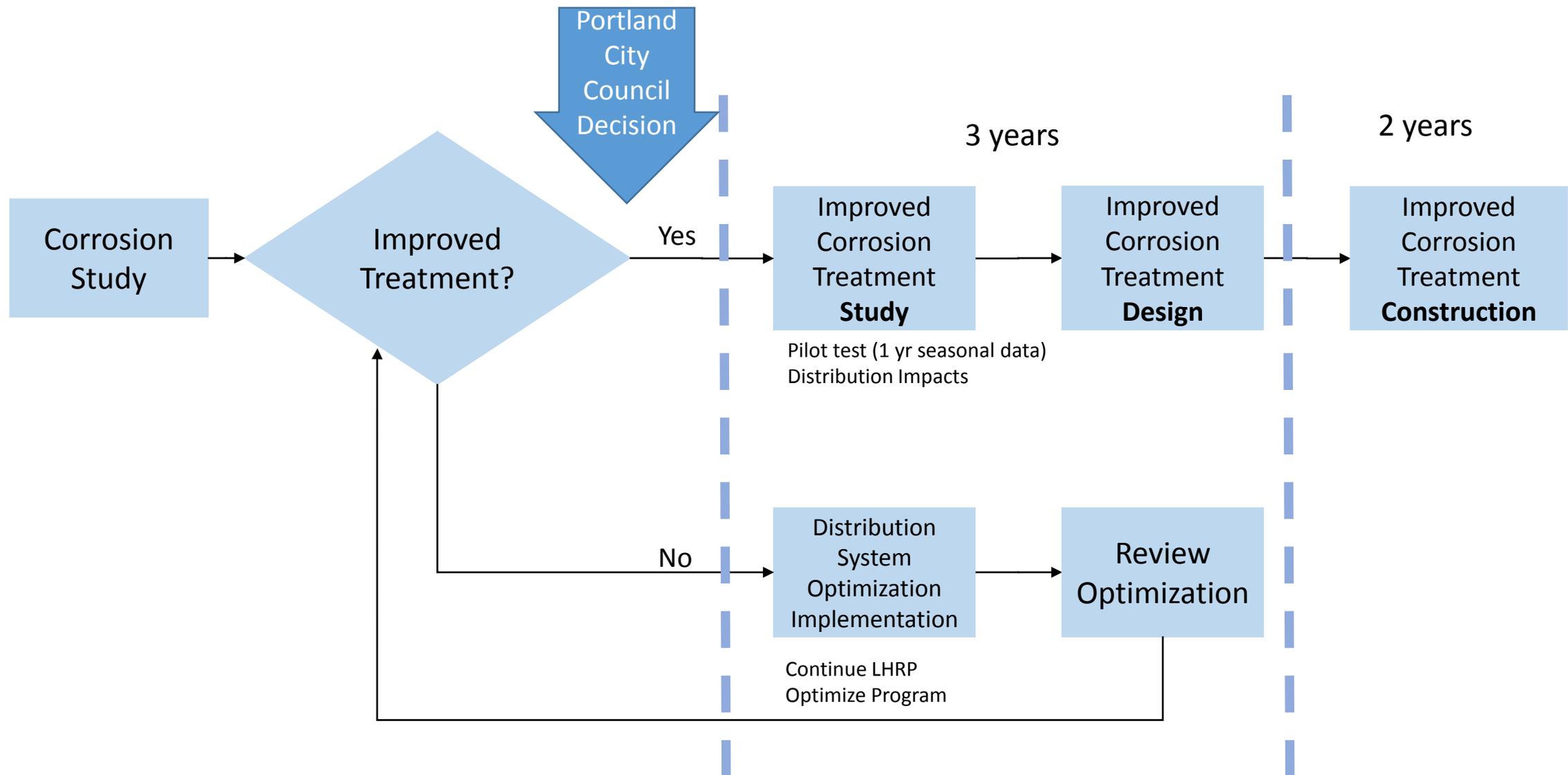
- Total and dissolved metals
 - lead, copper, aluminum, arsenic, cadmium, calcium, chromium, cobalt, iron, magnesium, manganese, nickel, zinc
- Total organic carbon
- Dissolved organic carbon
- Total phosphorus
- Alkalinity
- Hardness
- Chloride
- Sulfate
- Nitrate
- Nitrite
- TDS

Corrosion Study: Early Results



- LCR Sites
- △ Customer Sites
- Lead = 12 ppb or higher
- Lead = 5 to 11.9 ppb
- Lead = 0 to 4.9 ppb

Decision Tree

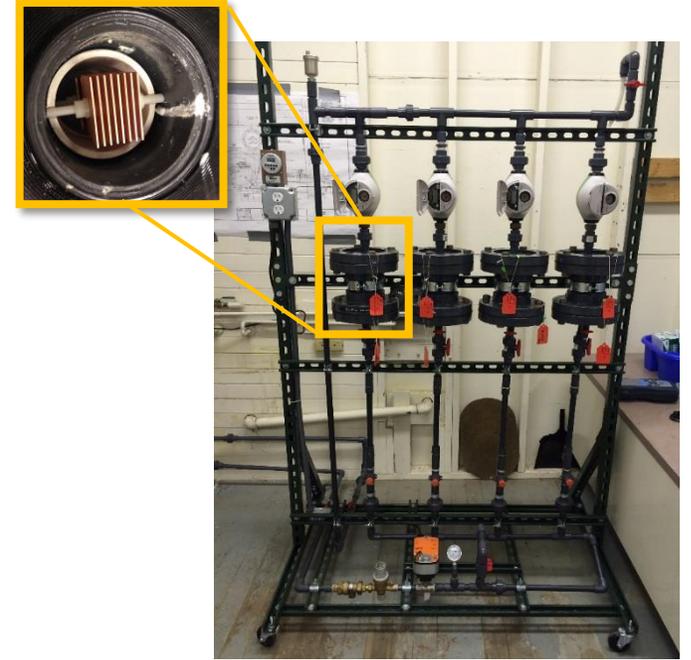


Considerations

- Meet federal requirements
- Reduce corrosiveness to reduce lead and copper and extend the useful life of our pipes
- Make our water more stable
- Avoid unintended water quality effects like red water or increased Disinfection By-Products
- Identify continued funding for reduction of other sources of lead
- Comply with discharge permit requirements
- Address capital and operational costs
- Maintain an expeditious schedule

Next Steps

- Water Quality Corrosion Study – complete Spring 2017
 - Understand mechanisms of lead release
 - Inform treatment decision
- Water Bureau develops recommendation for lead exposure reduction – 2017
- Council consideration – Summer 2017





Questions?

