



Little Changes can cause **Big Problems**
in a Water Distribution System

Jeff Coleman
Water Quality Supervisor
City of Longview

Why the source water change?

➤ Intake Issues

- Silt & dredging issues
- Debris
- Environmental



Mt. St. Helens (Pre May 18, 1980)

Mt. St. Helens
May 18, 1980
8:32 AM





Cowlitz River - a few hours later

**Cowlitz River at Longview
Intake
May 19, 1980**





**Longview Regional Water Treatment Plant and Intake
September, 2005**

Why the source water change?

➤ Intake Issues

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- Debris
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➤ Plant Age

- Upgrade & automation costs
- Equipment damage due to sediment



Ice

**Sedimentation Basin
Winter, 2009**



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➤ Plant Age & Condition

- Upgrade & automation costs
- Equipment damage due to sediment

➤ Water Availability

- Increased summer water demand
- Size of facility for demand



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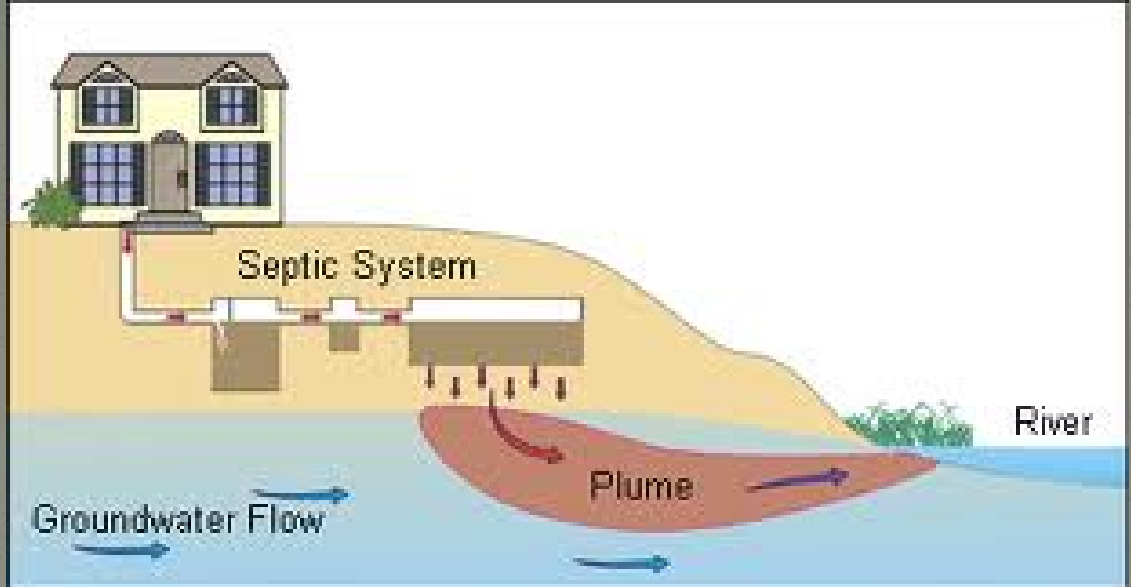
- Upgrade & automation costs
- Equipment damage due to sediment

➤ Water Availability

- Increased water demand
- Size of facility for demand

➤ Water Quality

- Upstream discharges
- Chemical costs





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➤ Water Availability

- Increased water demand
- Size of facility for demand

➤ Water Quality

- Upstream discharges
- Chemical costs

➤ Options Evaluated

- Develop remote source and pipe in
- Upgrade and expand existing plant

▪ **Develop
Mint Farm
source**

Preparation

| Expected Change | Mitigation |
|---------------------------|--|
| Reversal of flow | Hydraulic modeling |
| | Aggressive multi-directional flushing |
| | Flow-reversal simulation |
| Increased pressure events | Use of data loggers to track pressures |
| | Hydraulic modeling |
| | Replacement of most vulnerable mains |
| | Removal of truck fill station |
| Source Type Change | Analyzed over 14,000 samples |
| | Rapid transition to minimize mixing |
| | Reservoirs cleaned |
| | Community outreach |
| | Tracking - Citizen Sentinels |
| | Tracking - Discontinue fluoridation |

Mint Farm Regional Water Treatment Plant



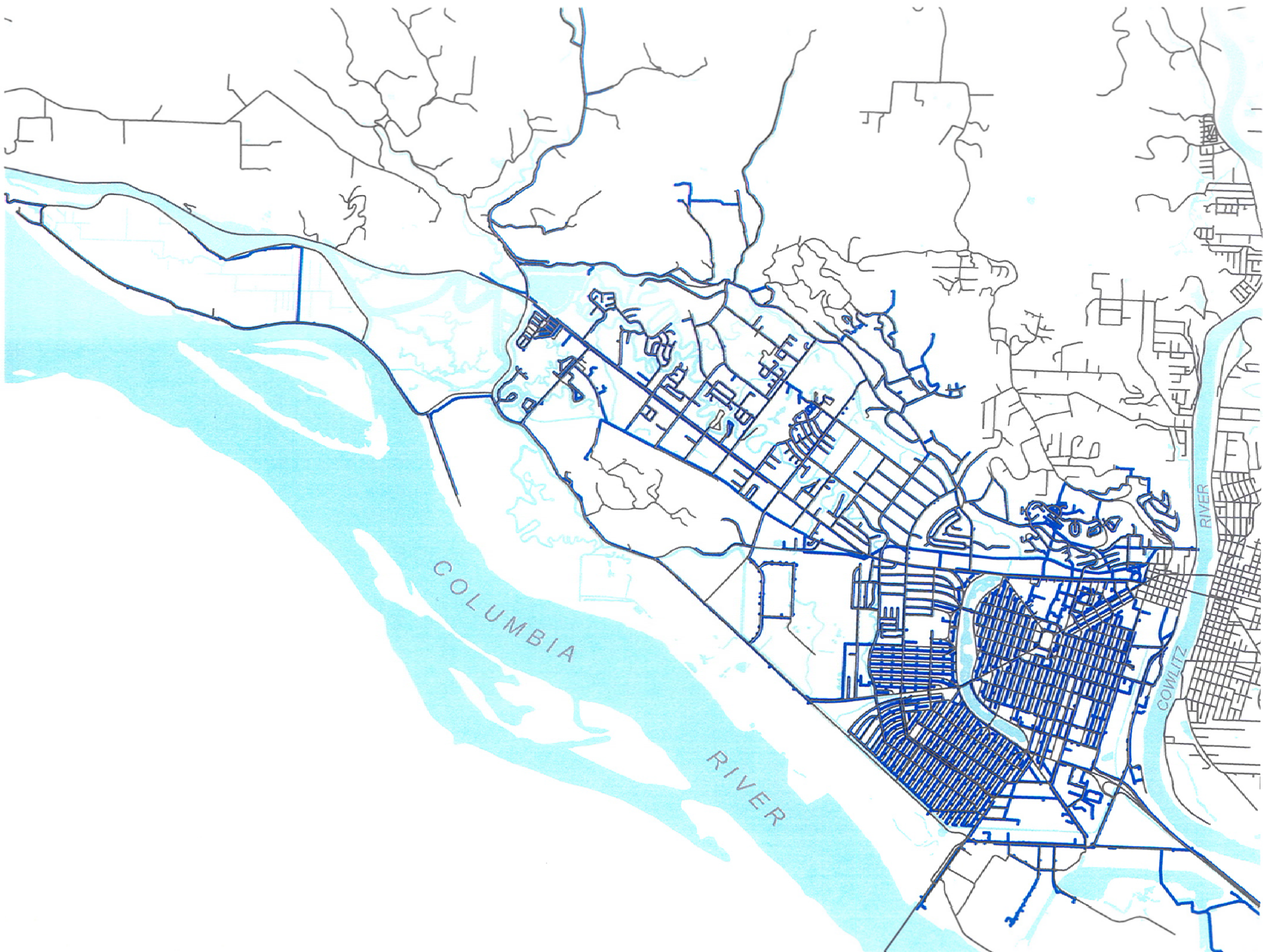
January 31, 2013



The Distribution System

- ± 205 miles of water main ranging from 2” to 30”
- Age of pipe up to 90 years old
- Pipe types
 - Cast Iron
 - Steel
 - Galvanized
 - Asbestos-Cement
 - C-900
 - HDPE







Flushing

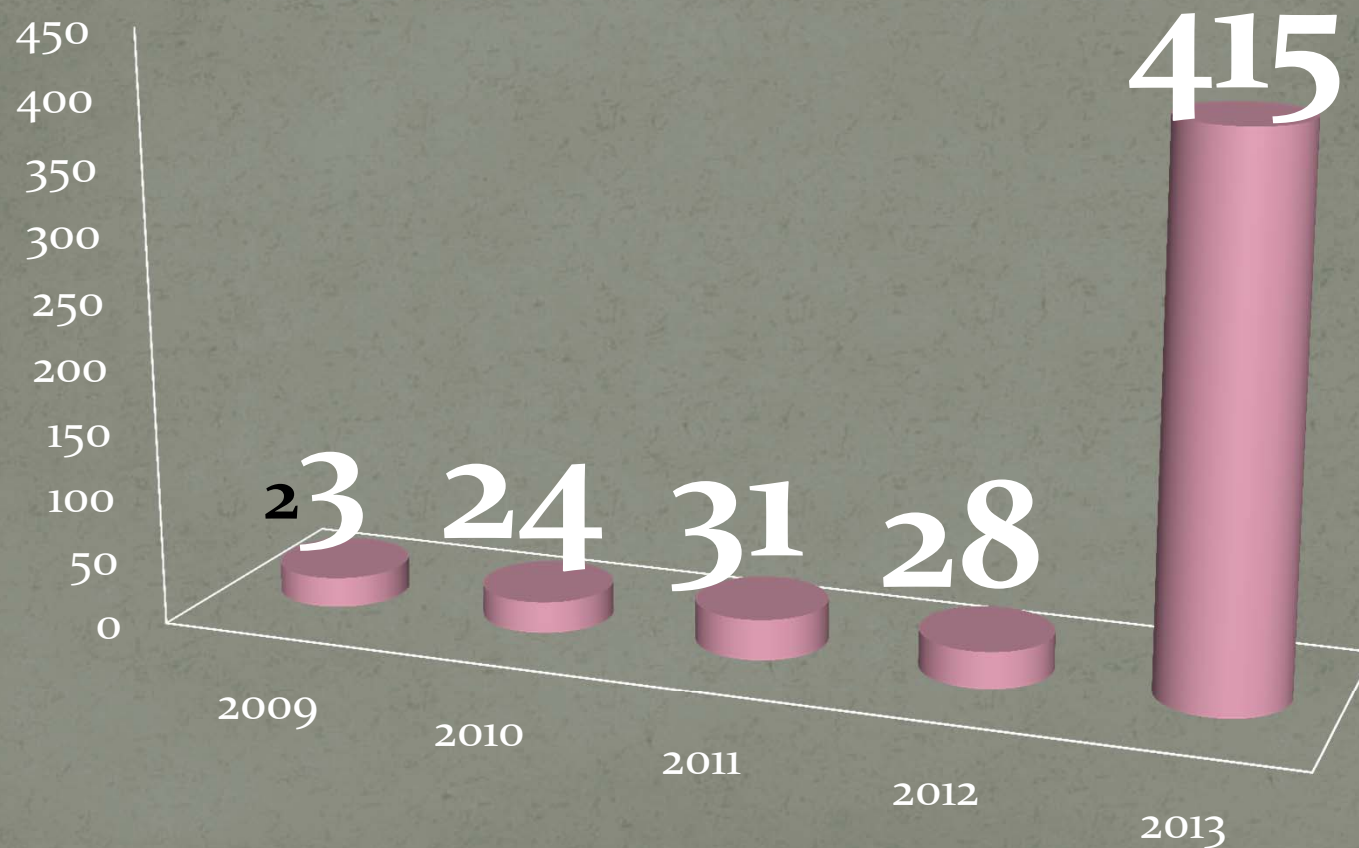
- Entire system - annually
- Main pressure zone - semi-annually
- Trouble spots - four times per year
- Average water flushed per year

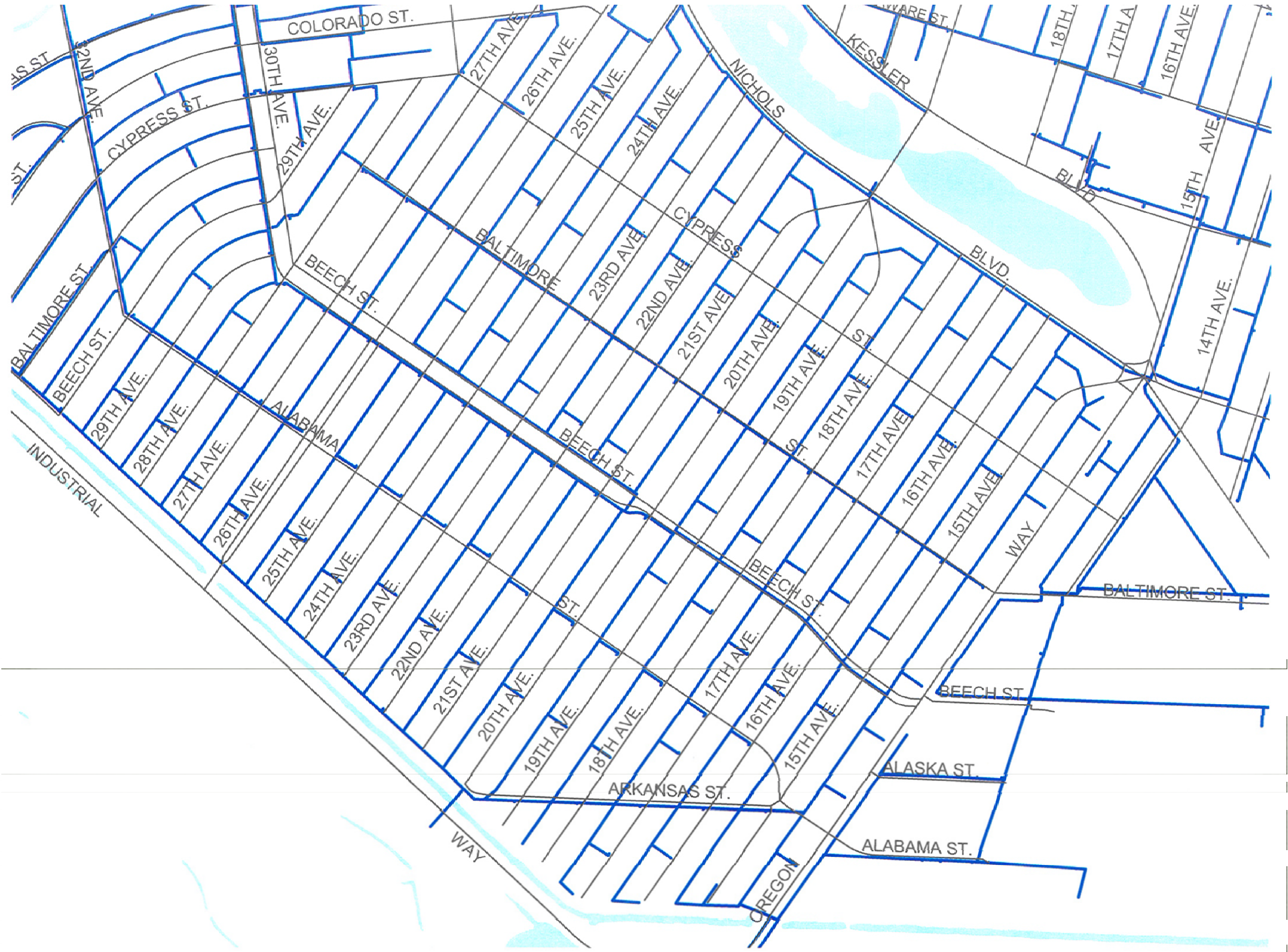
20,000,000 gallons



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WATER QUALITY COMPLAINTS







Before

After





Ice
Pigging



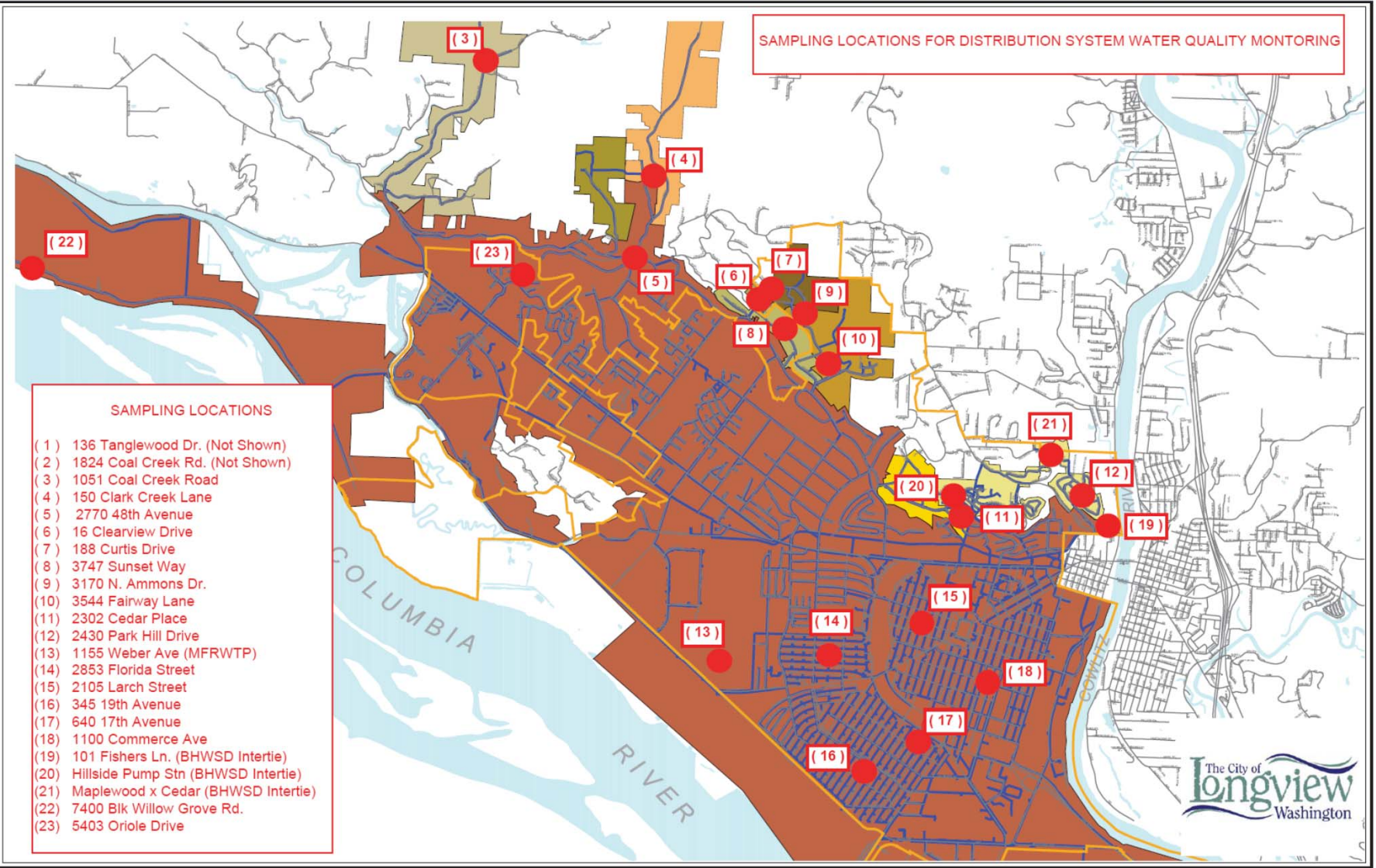




SAMPLING LOCATIONS FOR DISTRIBUTION SYSTEM WATER QUALITY MONITORING

SAMPLING LOCATIONS

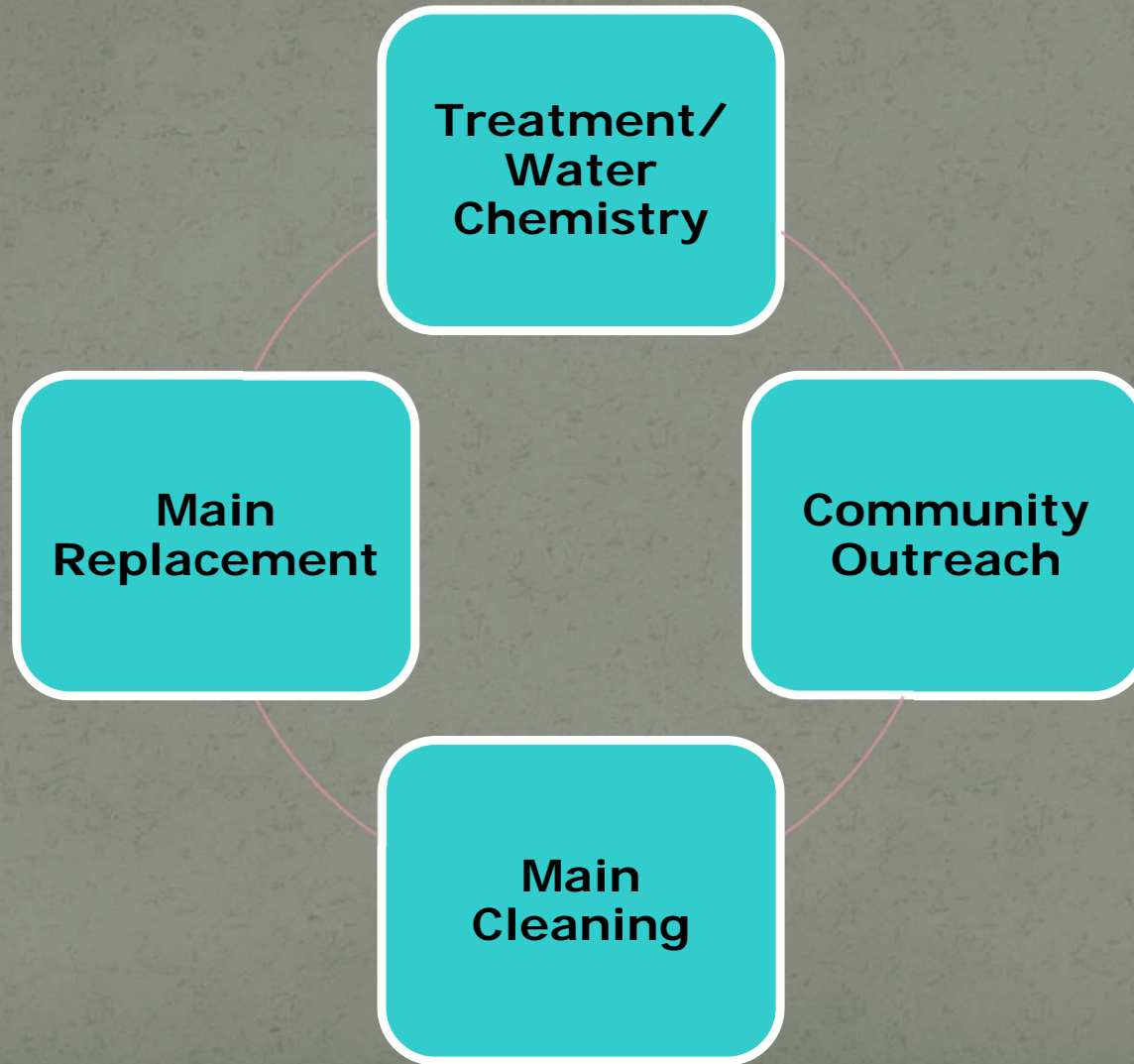
- (1) 136 Tanglewood Dr. (Not Shown)
- (2) 1824 Coal Creek Rd. (Not Shown)
- (3) 1051 Coal Creek Road
- (4) 150 Clark Creek Lane
- (5) 2770 48th Avenue
- (6) 16 Clearview Drive
- (7) 188 Curtis Drive
- (8) 3747 Sunset Way
- (9) 3170 N. Ammons Dr.
- (10) 3544 Fairway Lane
- (11) 2302 Cedar Place
- (12) 2430 Park Hill Drive
- (13) 1155 Weber Ave (MFRWTP)
- (14) 2853 Florida Street
- (15) 2105 Larch Street
- (16) 345 19th Avenue
- (17) 640 17th Avenue
- (18) 1100 Commerce Ave
- (19) 101 Fishers Ln. (BHWSD Intertie)
- (20) Hillside Pump Stn (BHWSD Intertie)
- (21) Maplewood x Cedar (BHWSD Intertie)
- (22) 7400 Blk Willow Grove Rd.
- (23) 5403 Oriole Drive



Longview residents grill council over water quality concerns



Four Pronged Approach



Treatment/ Water Chemistry

FINDINGS

- Much lower dissolved oxygen than surface water
- Caused the Oxidation Reduction Potential (ORP) to drop
- All water tests showed only secondary contaminant levels exceeded
- No positive coliform samples

ACTIONS

- Keep chlorine feed rate up (1.4 ppm)
- Keep pH up (above 7.7)

Community Outreach

- Water delivery from plant
- Bill reduction
- Showering privileges
- Flyer on flushing hot water tanks and private plumbing



Main Cleaning

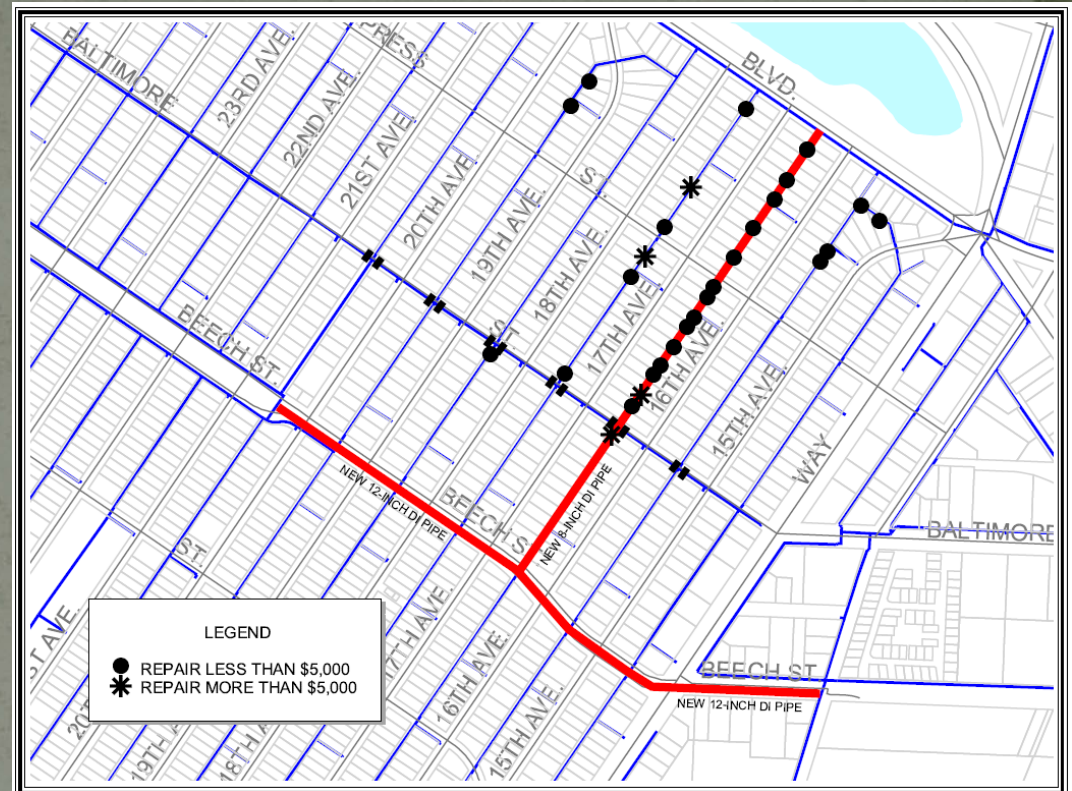
- Super-chlorination
- Multi-directional flushing
- Ice pigging
- Jetting
- Auto flushing

Need to Reduce Water Age



Main Replacement

- Declared an emergency
- Three month construction
- Replaced ± 10 blocks
- History of main breaks
- Inter-tied with industrial area



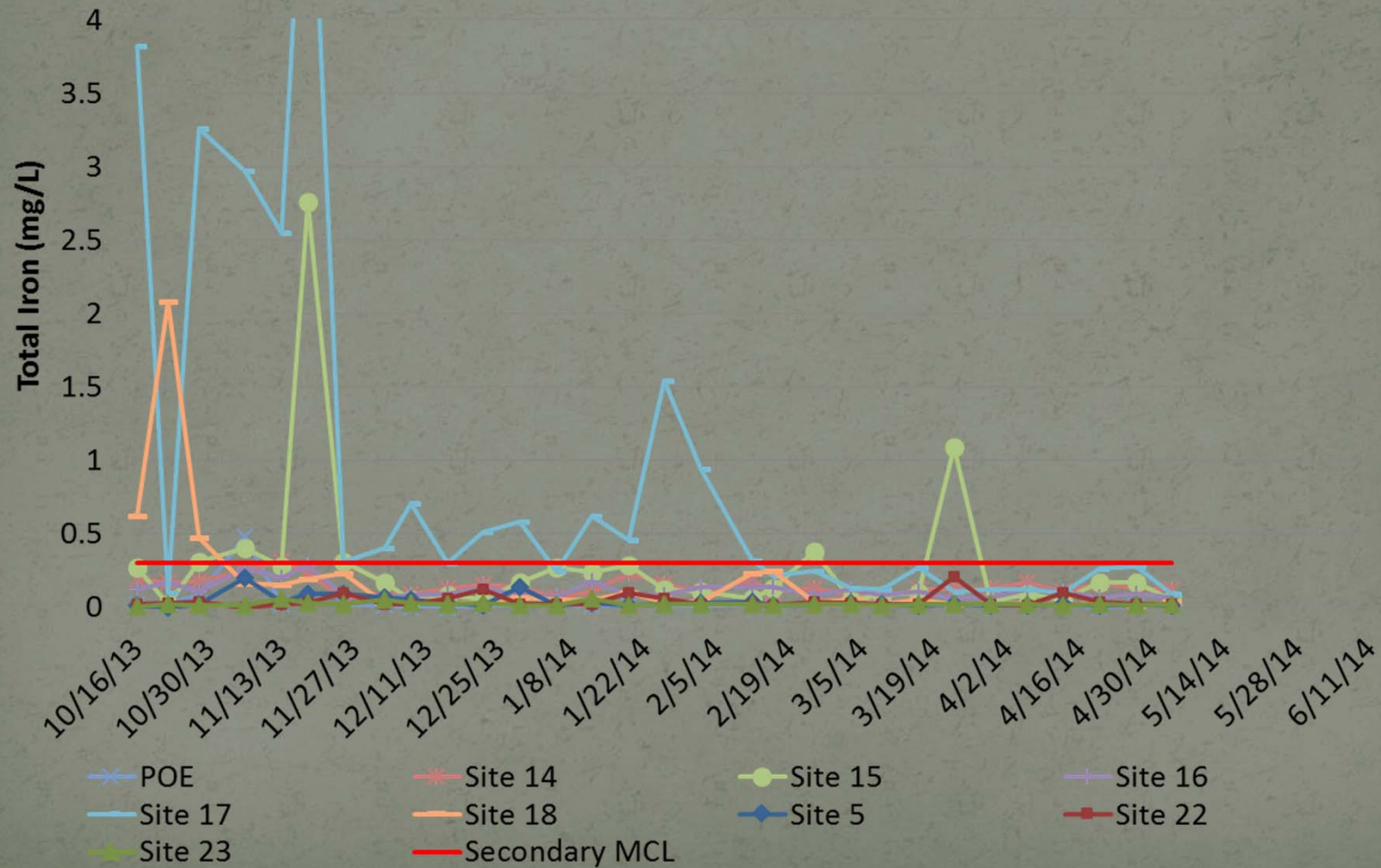
The Hardness that Wasn't!

- Surface water source - 26 mg/L
- Groundwater source - 97 mg/L
- Complaints of white spotting
- Community education on hardness

SILICA!



Total Iron Trending



On-Going Study



WHAT COULD THE
CITY OF LONGVIEW
DONE DIFFERENT?

**Chemistry
Reaction
to our
system**

**Better
Customer
Outreach**

**More
Employee
Education**

Questions

