



# *WATER QUALITY UPDATE*

*October 24, 2013*

*Presented by:  
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## *Outline*

- ▶ **Progress Report**
- ▶ **Water Main Cleaning**
- ▶ **Water Main Replacement**
- ▶ **Residential Support Program**
- ▶ **Phosphate Treatment Option**
- ▶ **Softening Investigation**
- ▶ **Temporary Water Quality Rate Reduction**
- ▶ **Recommendations**



## *Progress Report*

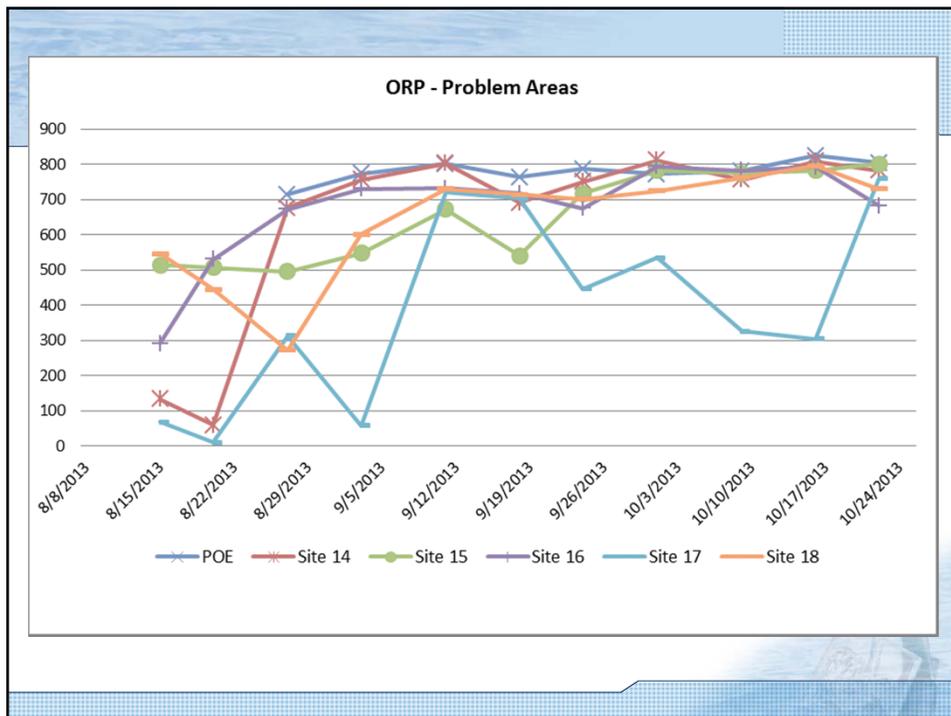
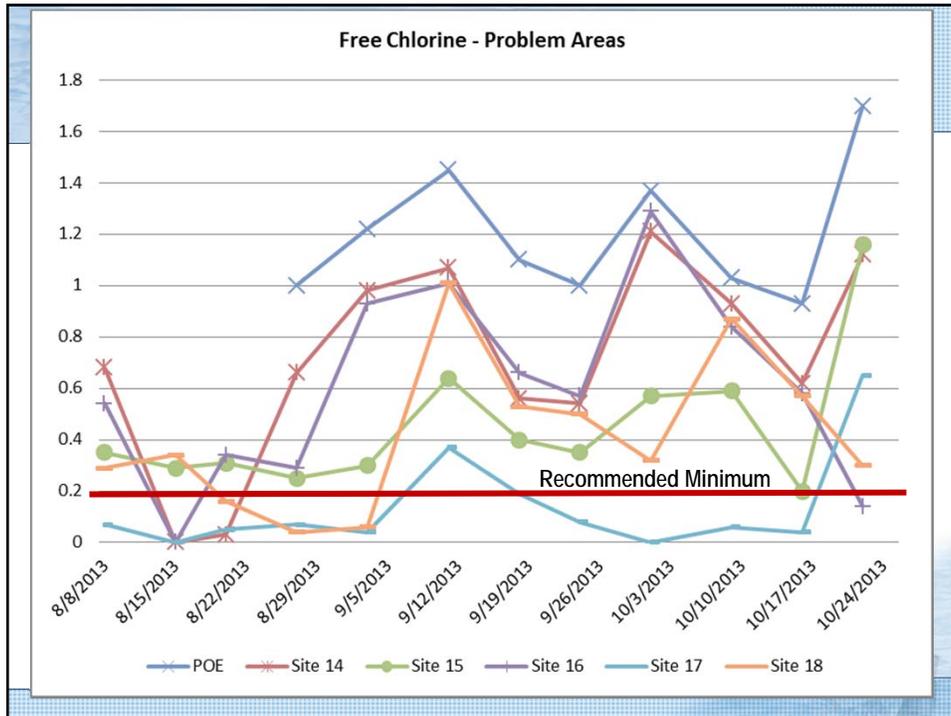
- ▶ **Canvassed Baltimore area with offer of assistance**
  - **Contacted approx. 300 residents; following up with remainder**
  - **Bottled water from MFRWTP distributed to 135 customers**
  - **Showering privileges at YMCA accepted by 6 customers**
- ▶ **Performed additional water main flushing**
  - **Ongoing regular flushing to exchange water**
  - **Two automatic flushers also used for water exchange**

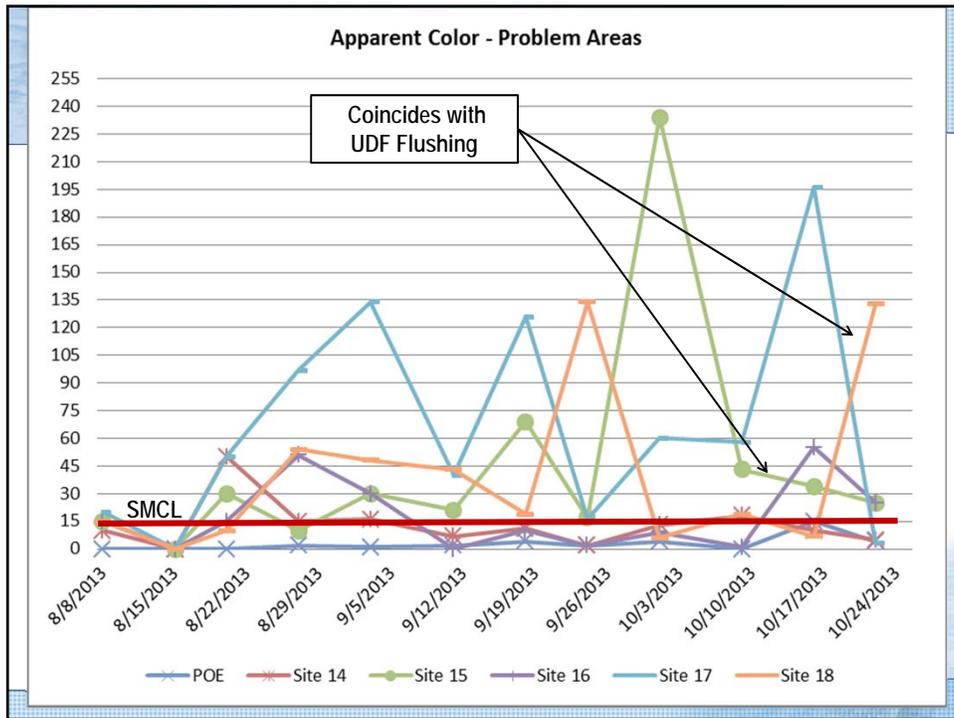
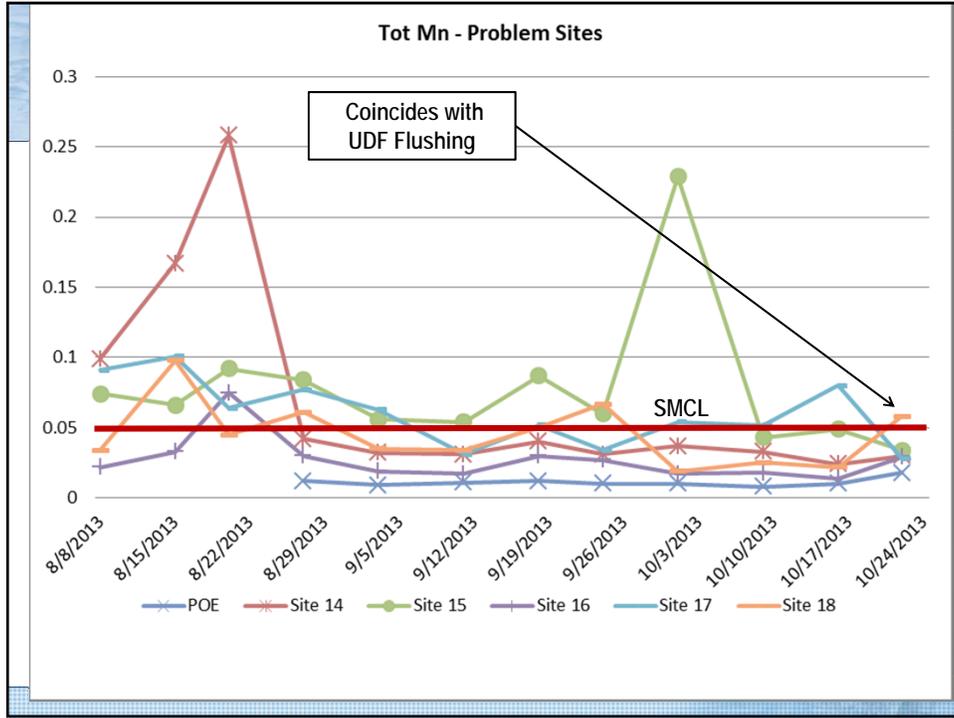


## *Progress Report (cont.)*

- ▶ **Ongoing distribution system sampling at 9 sites**
  - **Acceptable chlorine level at all problem areas except Site 17**
  - **ORP stabilized at all problem areas except Site 17**
  - **Mn level at or below SMCL at all problem areas except Site 17**
  - **Apparent color was elevated in several areas due to flushing**
  - **Test results indicate the distribution system is stabilizing**





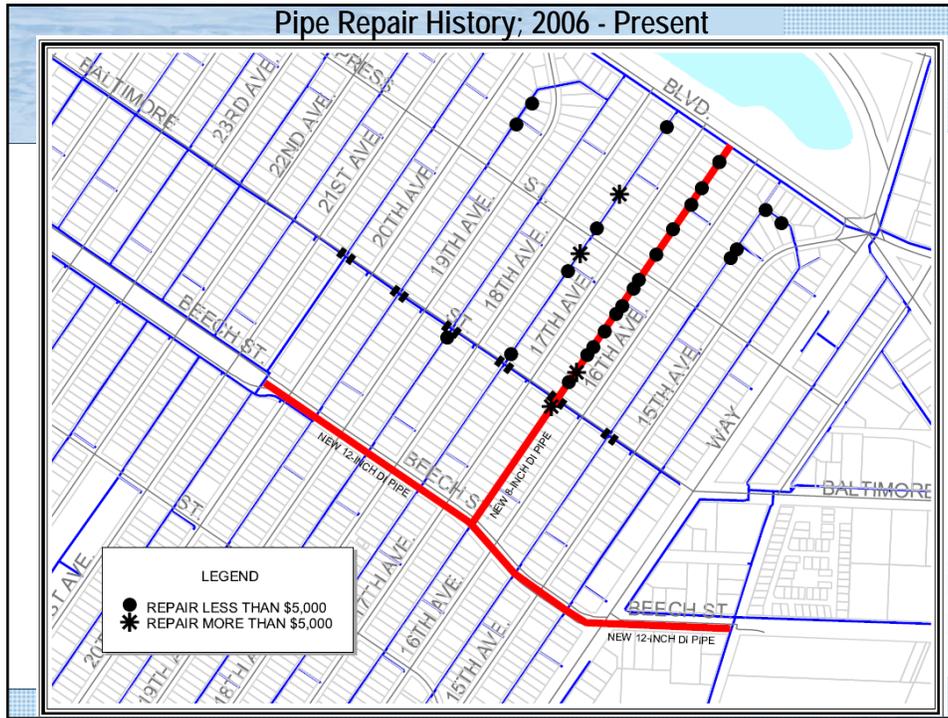


## *Water Main Cleaning*

- **Recommend additional automatic flushers**
    - Eight at \$2500 each = \$20,000
  - **Water jet pipe cleaning trial conducted October 23<sup>rd</sup>**
    - 6" main 2100 block OBHwy to reduce flow restriction
    - Likely not recommended in problem areas due to deteriorated pipe
    - Use removed OB Hwy pipe sections in pipe loop pilot study for phosphate treatment
  - **Pipe swabbing**
    - Suitable for cement lined & plastic pipe only
    - Removes bio-film, loose sediment, etc.
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## *Water Main Replacement*

- ▶ **Replace/install new water mains in Baltimore area**
    - Beech St. (20<sup>th</sup> to 14<sup>th</sup>) to increase flow and water exchange
    - 16<sup>th</sup>/17<sup>th</sup> alley (Beech to Nichols) to replace bad pipe
    - Abandon portions of Baltimore St. main to re-direct flow
    - Needed due to water quality issues and history of repairs
  - ▶ **Declare emergency for main replacement**
    - Expedites project completion
    - Expedites stabilization of water quality
    - Estimated cost = \$1.9M
    - Estimated 3-month construction period
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### Prioritized Pipe Replacement Projects

Projects	Size	Pipe	Issue	LF	Cost*
Beech Street (14 <sup>th</sup> to 20 <sup>th</sup> )	6"	GALV	WQ	2500	\$1,900,000
Alley between 16 <sup>th</sup> & 17 <sup>th</sup> (Beech to Nichols)	6"	CI	WQ	2200	
Alley between 15 <sup>th</sup> & 16 <sup>th</sup> (Beech to Nichols)	6"	CI	WQ	2200	\$745,000
Nichols Blvd (20 <sup>th</sup> to Oregon Way)	8"	CI	trees/leaks	2000	\$675,000
Beech Street (20 <sup>th</sup> to 30 <sup>th</sup> )	8"	CI	WQ	2800	\$945,000
Commerce Ave (Hemlock to Tennant)	6"	CI	leaks	4000	\$1,350,000
30th Ave (Beech to WA Way)	8"	CI	WQ	2000	\$675,000
Washington Way (30 <sup>th</sup> to 34 <sup>th</sup> )	-	CI	WQ	2800	\$945,000
Madrona (Laurel to Cascade)	4"	AC	leaks	2100	\$710,000
Alley between 20 <sup>th</sup> & 21 <sup>st</sup> (Fir to WA Way)	6"	AC	leaks	1200	\$405,000
Alley between 19 <sup>th</sup> & 20 <sup>th</sup> (Delaware to WA Way)	6"	AC	leaks	2000	\$675,000
Alley between 18 <sup>th</sup> & 19 <sup>th</sup> (Delaware to Florida)	6"	AC	leaks	1300	\$440,000
Alleys between 26 <sup>th</sup> & 27 <sup>th</sup> and 27 <sup>th</sup> & 28 <sup>th</sup> (Baltimore to CO)	6"	AC	low flow	3000	\$1,015,000
Wildwood (3200 block to end of street)	1½"	GALV	low flow	1000	\$340,000
Alleys between 7 <sup>th</sup> & 8 <sup>th</sup> and 8 <sup>th</sup> & 9 <sup>th</sup> (Hemlock to Delaware)	4"	CI	leaks	9000	\$3,040,000
Pacific Way (32 <sup>nd</sup> to 38 <sup>th</sup> )	8"	AC	leaks	4000	\$1,350,000
Alleys between 24 <sup>th</sup> & 25 <sup>th</sup> and 25 <sup>th</sup> & Kessler (N. of Louisiana)	6"	CI	leaks/flow	2000	\$675,000
Dead-end lines serving 5 - 6 homes with very low volume	2" - 2½"	GALV	low flow	-	-

\* Based on construction at \$270/LF plus 25% allowance for design, construction management & contingency

## *Residential Support Program*

- ▶ **Provide Onsite Customer Assistance**
  - Identify potential problems between meter and fixtures
  - Advise customers how to flush service line and private plumbing
  - Provide additional recommendations if water quality does not improve to match quality in water main
    - Replace faucet aerators
    - Replace point of use filters
    - Drain & flush hot water heater
    - Properly maintain any in-home treatment systems
    - Replace galvanized and other old pipe material
  - Distribute AWWA literature with additional consumer tips

## *Public Outreach*

- ▶ Press release issued regarding distribution of bottled MFRWTP water
- ▶ Water quality specific fact sheet(s) provided to customers based on types of complaint
- ▶ Weekly summary of water quality added to City website
- ▶ Current test information added to City website weekly
- ▶ Weekly update to social media networks, citizen sentinels
- ▶ Exploring options to supplement electronic media
  - Regular update notices placed in newspaper and radio
  - Door hangers
  - Other

## *Phosphate Treatment Option*

- ▶ **Phosphate addition will help to:**
    - **Speed re-stabilization of pipe scale**
    - **Sequester iron and manganese to reduce staining/odor/taste**
    - **Sequester calcium and other suspended solids to reduce spotting**
  - ▶ **Initial negative response before water quality improves**
  - ▶ **Minimum 1 - 2 years implementation with stepped dosage**
  - ▶ **Temporary installation unless pilot testing or implementation demonstrates long-term benefit**
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## *Phosphate Treatment Option (cont.)*

- ▶ **WAC 246-290-110 requires Department of Health approval before installing any water system improvement**
  - ▶ **Engineering report submitted to DOH must include:**
    - **Description of problem and corrective actions taken**
    - **Results of pilot testing and design recommendations**
    - **Design drawings and specifications**
    - **Implementation plan**
    - **Distribution system monitoring plan**
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### *Phosphate Treatment Option (cont.)*

- ▶ **Retain Confluence Engineers for phosphate evaluation**
  - Nationally recognized expert on distribution system issues
  - Supplemental to ongoing investigations
- ▶ **Phosphate evaluation to address items required by DOH**
  - Conduct jar testing and ceramic tile spotting tests
  - Assist with pilot testing, home trials, and data interpretation
  - Provide recommendations for full scale implementation
  - Develop distribution system monitoring plan
- ▶ **Estimated fee: \$59,306**

### *Phosphate Treatment Option (cont.)*

- ▶ **Retain Kennedy/Jenks Consultants for system design**
  - Demonstrated experience with similar installations
  - Design expediency given familiarity with Mint Farm RWTP
- ▶ **Design will consider temporary nature of system with potential for long-term application**
  - Alternative 1 – temporary installation using space within existing building footprint
  - Alternative 2 – semi-permanent installation to accommodate additional chemical needs and house injection equipment
  - Estimated fee: \$80,700 (Alternative 2)

## *Softening Investigation*

- ▶ **Hardness is not the only contributor to white spotting**
  - Silica
  - Other components of Total Dissolved Solids (TDS) left behind after evaporation
- ▶ **Typical softening processes will only reduce calcium levels**
  - Minimal magnesium or silica reduction
  - Lowest practicable hardness achievable by treatment  $\approx 50$ 
    - “Soft” but twice the level of Cowlitz River
  - Spotting reduction estimated at 30% (won’t be eliminated)
  - Hardness goal of most softening treatment processes = 100
    - Maximum water hardness in City distribution system = 107
    - Hardness in distribution system higher than treatment plant finished water
  - Unable to assess softened water benefits for skin/hair

## *Softening Investigation (cont.)*

- ▶ **Very expensive, labor intensive, complex processes needed to reduce TDS other than calcium**
- ▶ **Potential to reduce spotting by optimizing well pumping strategy**
  - Treatment plant design based on testing of Well #1 during feasibility study – best quality of the four production wells
  - Well #2 - slightly higher ammonia level (increases chlorine use)
  - Well #3 - slightly higher levels of Calcium & Magnesium
  - Limit use of Well #3
    - To meet water demand
    - To provide maintenance time for other wells
  - May not provide enough spotting reduction

## *Softening Investigation (cont.)*

- ▶ **Expand Confluence Engineers scope to demonstrate softening results**
  - Add bench scale testing
  - Prepare softened waters based on available technologies
  - Conduct ceramic tile spotting tests to demonstrate results
  - Demonstrate effectiveness at controlling spotting before decision to install treatment facilities
    - Which solids control white spotting?
    - Is calcium removal enough to reduce spotting?
    - Will phosphate treatment reduce spotting?
- ▶ **Degree of improvement will be subjective**
- ▶ **Estimated fee: \$48,248 (includes additional support for ongoing water quality testing and analysis)**

## *Temporary Water Quality Rate Reduction*

- ▶ **Applies only to customers impacted by release of iron and manganese; chlorine and hardness issues do not qualify**
- ▶ **Customers with known/reported problems are eligible for 6-month rate reduction:**
  - Within geographic area Nichols to Baltimore from 15<sup>th</sup> to 19<sup>th</sup>
  - Complaints recorded before October 14<sup>th</sup>
- ▶ **New complaints which exceed test parameters from customer plumbing are eligible for 2-month rate reduction**
- ▶ **Continued eligibility after initial term if test parameters are exceeded in the public water main**

### *Temporary Water Quality Rate Reduction (cont.)*

- ▶ **Eligibility for new complaints determined by one or more of the following criteria:**
  - Iron at or above 0.3 mg/L
  - Manganese at or above 0.05 mg/L
  - Color at or above 15 color units
  - Samples collected by City staff from customer hose bib
- ▶ **If customer plumbing test fails eligibility – one repeat test allowed one week later, unless area water quality declines**
- ▶ **Customers with non-quantifiable water quality issues may be eligible at discretion of the Public Works Director**

### *Temporary Water Quality Rate Reduction (cont.)*

- ▶ **Residential and Multi-family**
  - 50% reduction on monthly base rate; plus
  - 50% reduction on consumption regardless of quantity
- ▶ **Commercial**
  - 50% reduction on monthly base rate; plus
  - 50% reduction on consumption of first 800 cf
  - 30% reduction on consumption of next 800 cf
  - 15% reduction for consumption over 1,600 cf

## *Recommendations*

- ▶ **Authorize purchase of additional automatic flushers**
  - ▶ **Authorize alternative main cleaning options**
  - ▶ **Approve Resolution 2087 allowing water rate reduction**
  - ▶ **Authorize emergency declaration for pipe replacement**
  - ▶ **Monitor distribution system and allow time to re-stabilize**
  - ▶ **Optimize well operating strategy for water quality advantage**
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## *Recommendations (cont.)*

- ▶ **Authorize contract amendment with Confluence Engineering for phosphate evaluation and softening bench test demonstration**
    - **Readiness to proceed if conditions changes**
    - **Phosphate testing also useful in evaluating softening**
  - ▶ **If Council chooses to proceed with phosphate design concurrently with pilot testing:**
    - **Authorize contract amendment with Kennedy/Jenks for design of phosphate injection system**
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