



Small Systems TAC Board Meeting Harrisburg, PA

*Impact
of
Pre-Draft Chapter 109 Revisions:
One Water Utility's Perspective*

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Presenter

Dan Preston

- Professional Engineer in PA and NJ
- Director of Operations and Engineering for North Penn Water Authority (NPWA)
- 29 years of direct experience in the water utility industry in all aspects of the business
- B.S., Environmental Engineering, Penn State
- MBA, Organizational Management, Eastern U.



Co-Presenter

Heidi Palmer

- Water Quality Manager for North Penn Water Authority (NPWA)
- 21 years of direct experience in the water utility industry related to water quality
- B.S., Chemistry, West Virginia University
- M.S., Public Health, University of North Carolina



Agenda

- Who is NPWA?
- Why are we here?
- NPWA Distribution System Management
- Partnership for Safe Water
- How the proposed Chapter 109 revisions impacts NPWA
- Conclusions
- Questions



North Penn Water Authority

- Medium-sized water system
- Serving a population of 80,000 people in 21 municipalities in Bucks and Montgomery County in SE PA
- 48 full-time employees
- Avg. Daily Water Demand = 10 MGD
- 85% surface water/15% ground water



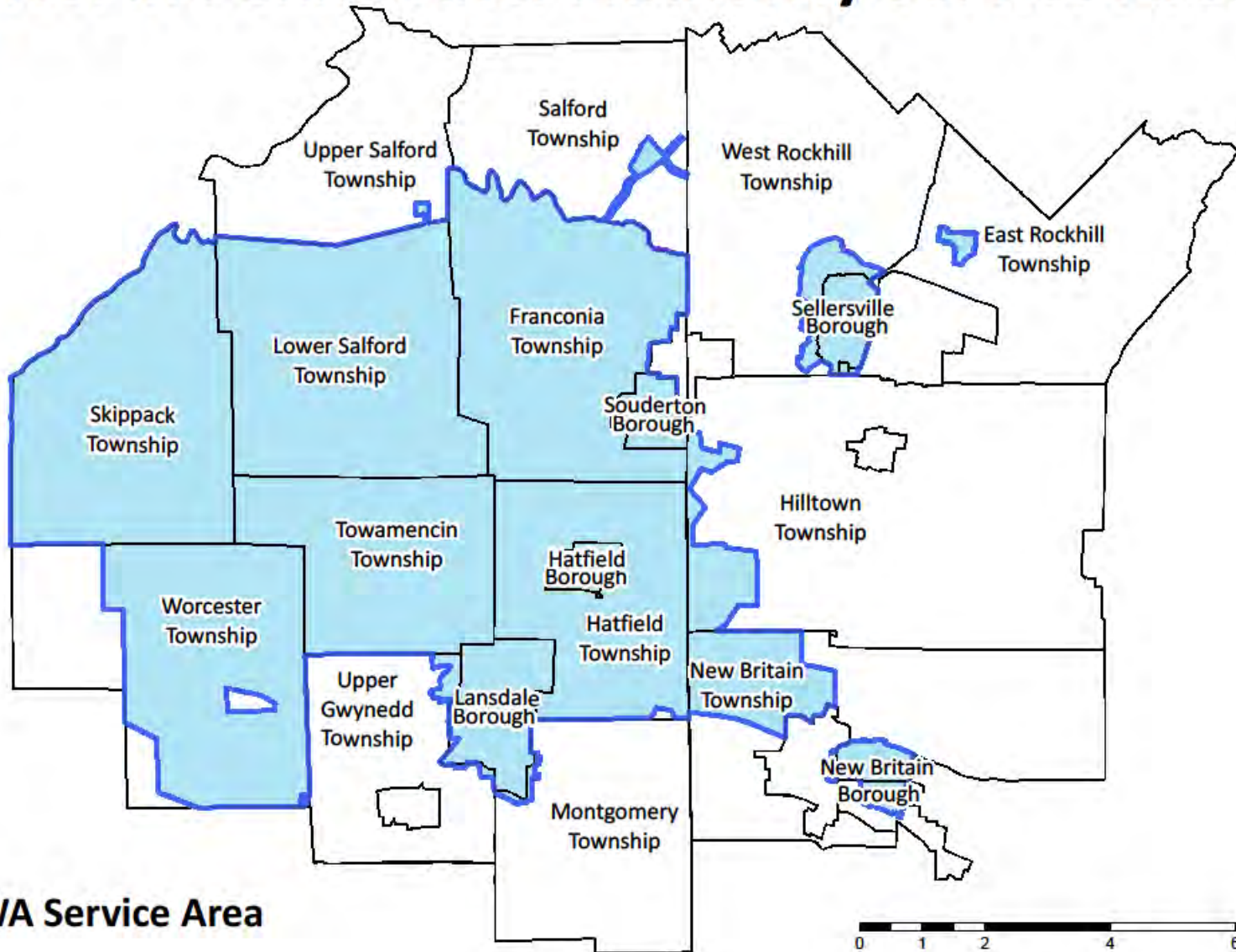
North Penn Water Authority

- One Surface Water Treatment Plant (Forest Park)
- Fifteen Groundwater Wells throughout the system
- Use chlorination as the primary disinfection process and to maintain chlorine residuals in the water system
- 560 miles of water main
- 33,600 service connections

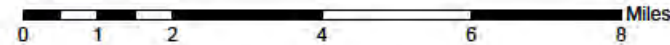


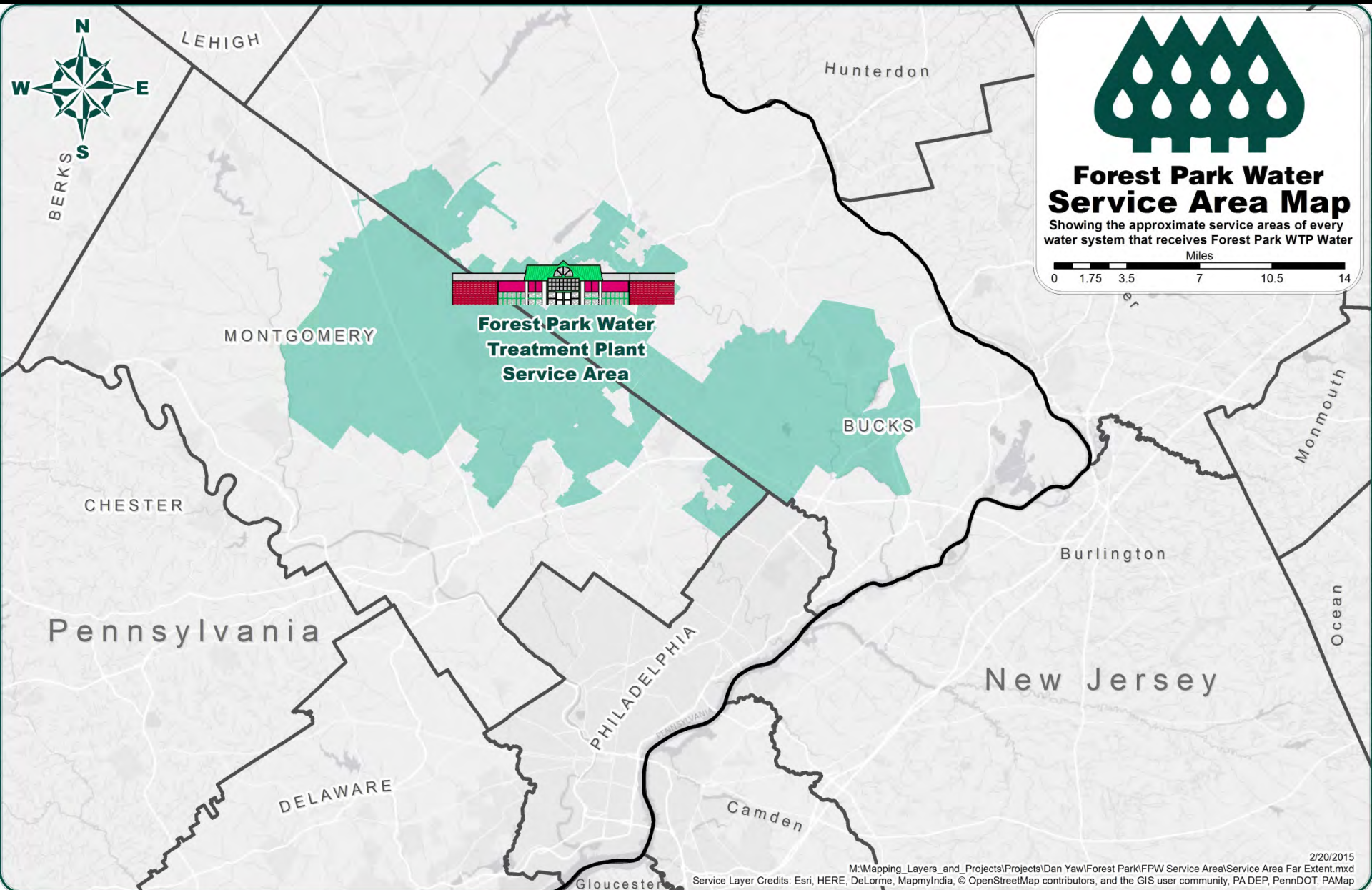


North Penn Water Authority Service Area



 NPWA Service Area






Forest Park Water Service Area Map

Showing the approximate service areas of every water system that receives Forest Park WTP Water

Miles
0 1.75 3.5 7 10.5 14

The background features a large, stylized logo for MWD (Metropolitan Water District) in a light blue color. The letters are bold and have a slight 3D effect with shadows.

*A dedicated, professional workforce
committed to providing the
community with a safe, reliable,
and economical water supply*



Why are we here?

- Provide stakeholder input into pre-draft Chapter 109 revisions
- Provide real world feedback as to how these revisions (as currently written) will impact a well-managed, medium-sized water utility
- Focus: chlorine residual levels, PN's and Heterotrophic Plate Count (HPC)



Distribution System Management

- NPWA Incorporates Best Management Practices
 - Long Range Plan (updated every 5 years)
 - Infrastructure Improvement Program
 - Asset Management Program
 - Distribution System Optimization Program (Partnership for Safe Water)



Partnership for Safe Water

- Formed in 1993, as a result of a cryptosporidiosis outbreak in Milwaukee.
- The *Partnership* is an unprecedented alliance of six prestigious drinking water organizations:
 - American Water Works Association (AWWA)
 - Federal Environmental Protection Agency (EPA)
 - Association of State Drinking Water Administrators (ASDWA)
 - Association of Metropolitan Water Agencies (AMWA)
 - National Association of Water Companies (NAWC)
 - Water Research Foundation (WRF)



Partnership for Safe Water

- The *Partnership's* mission is to improve the quality of water delivered to customers by optimizing water system operations.
- The *Partnership* offers self-assessment and optimization programs so that operators, managers and administrators have the tools to improve performance above and beyond even proposed regulatory levels.



Partnership for Safe Water

Why Did We Join?

- Natural Progression
- Goals Alignment
- Recognized Quality Improvement Program
- Treatment Plant Optimization
 - Forest Park Water a member since 1997 – Has achieved 10 year Director's Award and since 2012 has held the Phase IV President's Award.



Partnership for Safe Water

Distribution System Optimization Program (DSOP)

- Supreme Excellence in Water Distribution Systems
- Distribution Optimization analyzes systems based on processes, procedures and metrics, resulting in high-performance and improved system integration.
- NPWA is a charter member in 2011 and the first water utility in PA to join the program.
- Working on Phase III report this year and expect to receive Director's Award in the near future.



Partnership for Safe Water

Distribution System Optimization Program (DSOP)

- Three main components:
 - Chlorine Residual Management
 - Pressure Management
 - Main Break Frequency



Partnership for Safe Water

Distribution System Optimization Program (DSOP)

- Chlorine Residual Optimization Goal
 - Maintain 0.2 ppm free chlorine at 95% of routine samples taken each month
- Water Utilities that can meet all benchmarks are in highest echelon and exceed regulatory compliance performance requirements
- This is a goal or guideline to strive for – not a requirement.

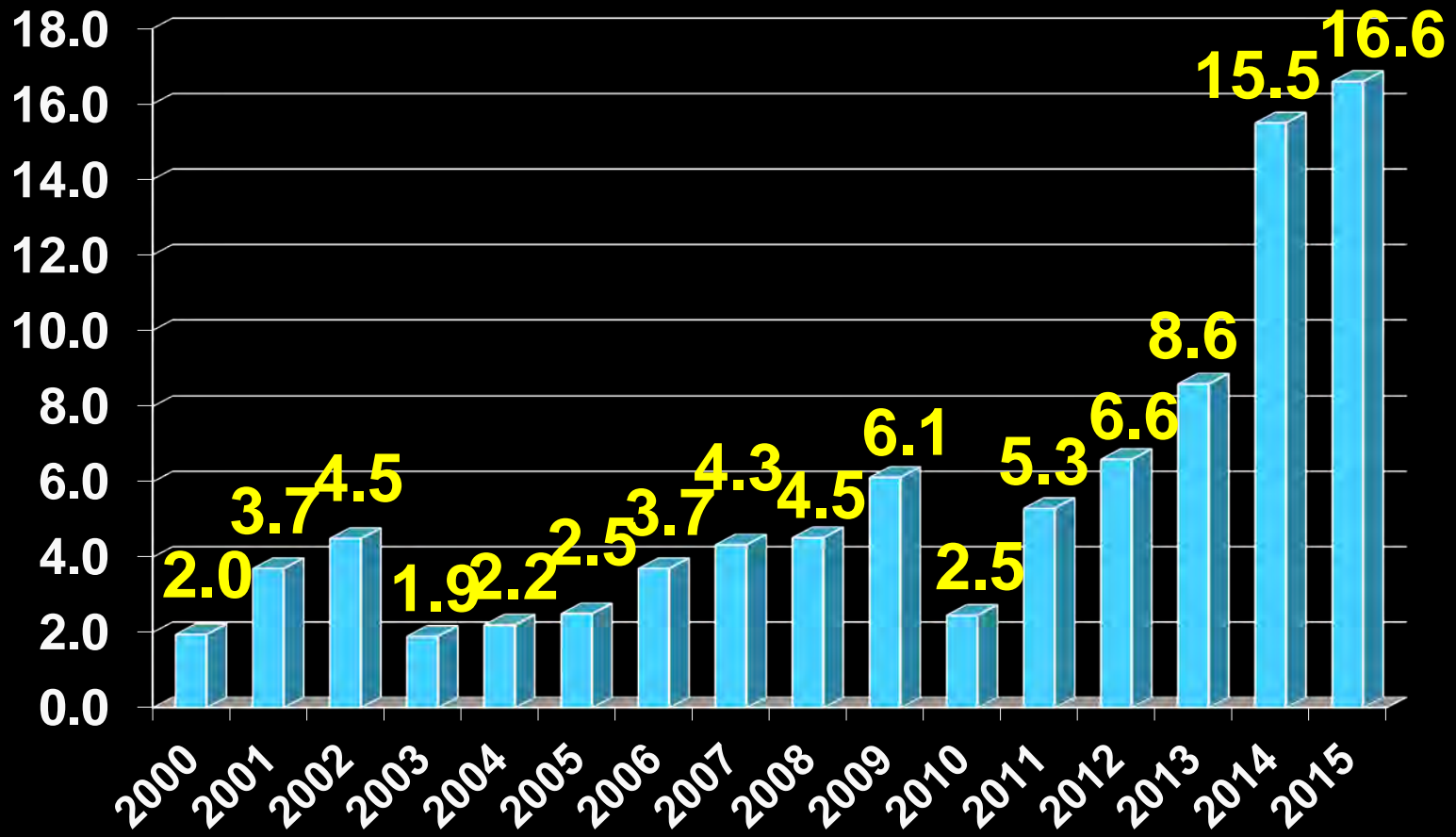


Distribution System Management

- Annual Flushing
- Valve Exercising Program
- Tank Mixing
- Leak Detection Surveying
- System Grid Reinforcement
- Main Replacement/Rehabilitation
- Reduce water age
- Significant Capital Investment

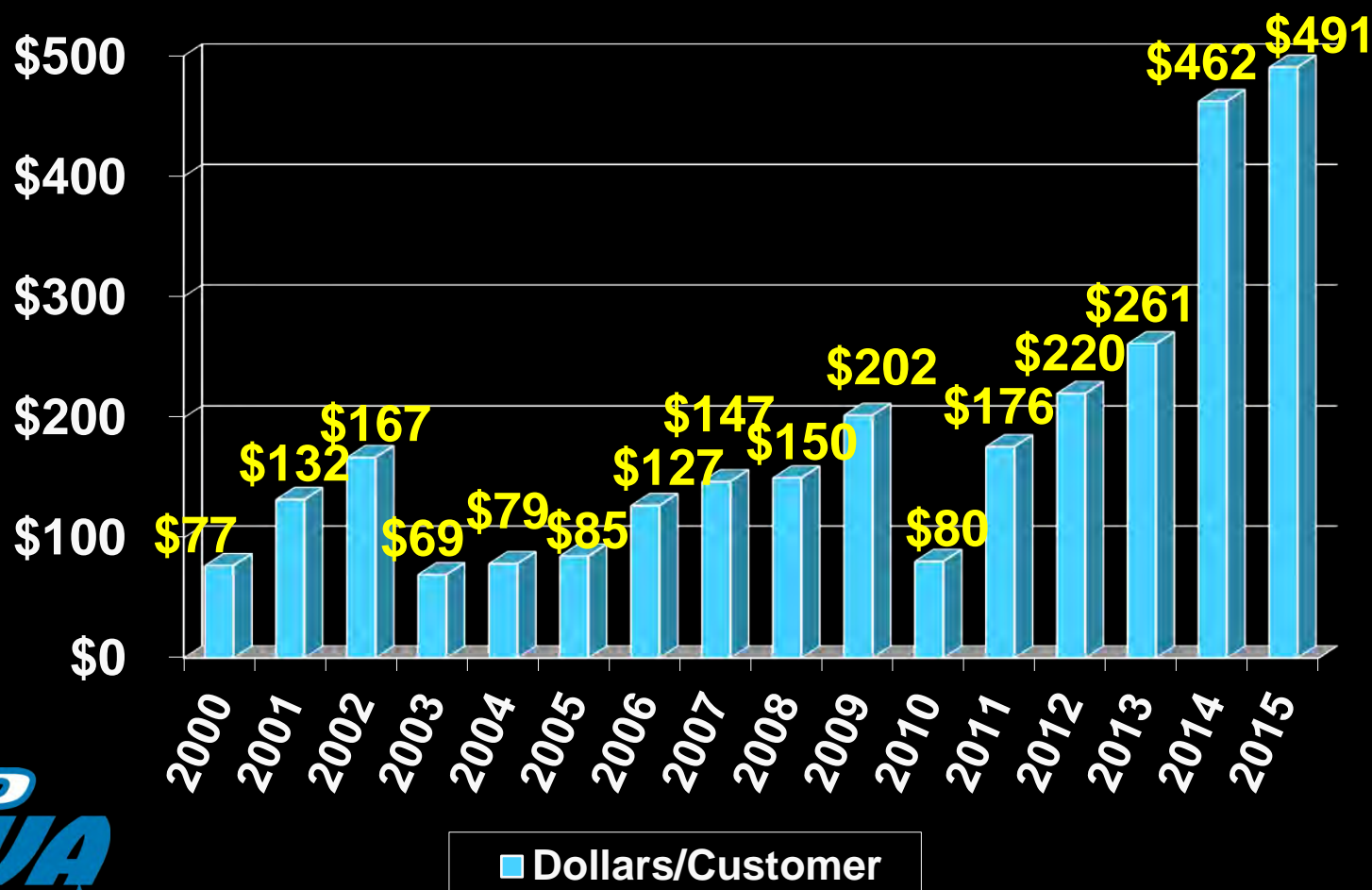


Water System Improvements



■ Dollars (millions)

Water System Investment/Customer



Distribution System WQ Management

- PA DEP-certified full service laboratory
- Chlorine Residual Management
 - Detailed database in accordance with DSOP
- Rigorous Sampling Program
 - Collect 100 samples per month (only 80 are required)
 - Monitor Heterotrophic Plate Count (HPC) at all locations



Distribution System WQ Management

- Sample site locations include:
 - Storage facilities
 - Dead ends
 - Areas of high water age
 - Interconnections



Distribution System WQ Management

- Since 2013, 2,796 total samples collected with only 1 Total Coliform positive samples. No samples were *E. Coli* positive:
 - System was always in compliance
 - September 2013 – Free Cl₂ residual = 0.71 mg/L



Proposed Chap 109 Rev.

- 109.710 (a) *" The minimum disinfectant residual shall be 0.30 mg/L measured as free chlorine for systems using chlorine.. "*
- 109.710 (b) Revisions eliminate the use of Heterotrophic Plate Counts (HPC) as part of compliance monitoring



Proposed Chap 109 Rev.

- 109.710 (c) *" Failure to maintain the minimum disinfectant residual at any location is a treatment technique violation. A public water system that experiences a treatment technique violation shall notify the Department within 1 hour in accordance with 109.701(a)(3) (relating to reporting and recordkeeping) and issue a Tier 2 public notice....."*



What is the impact?

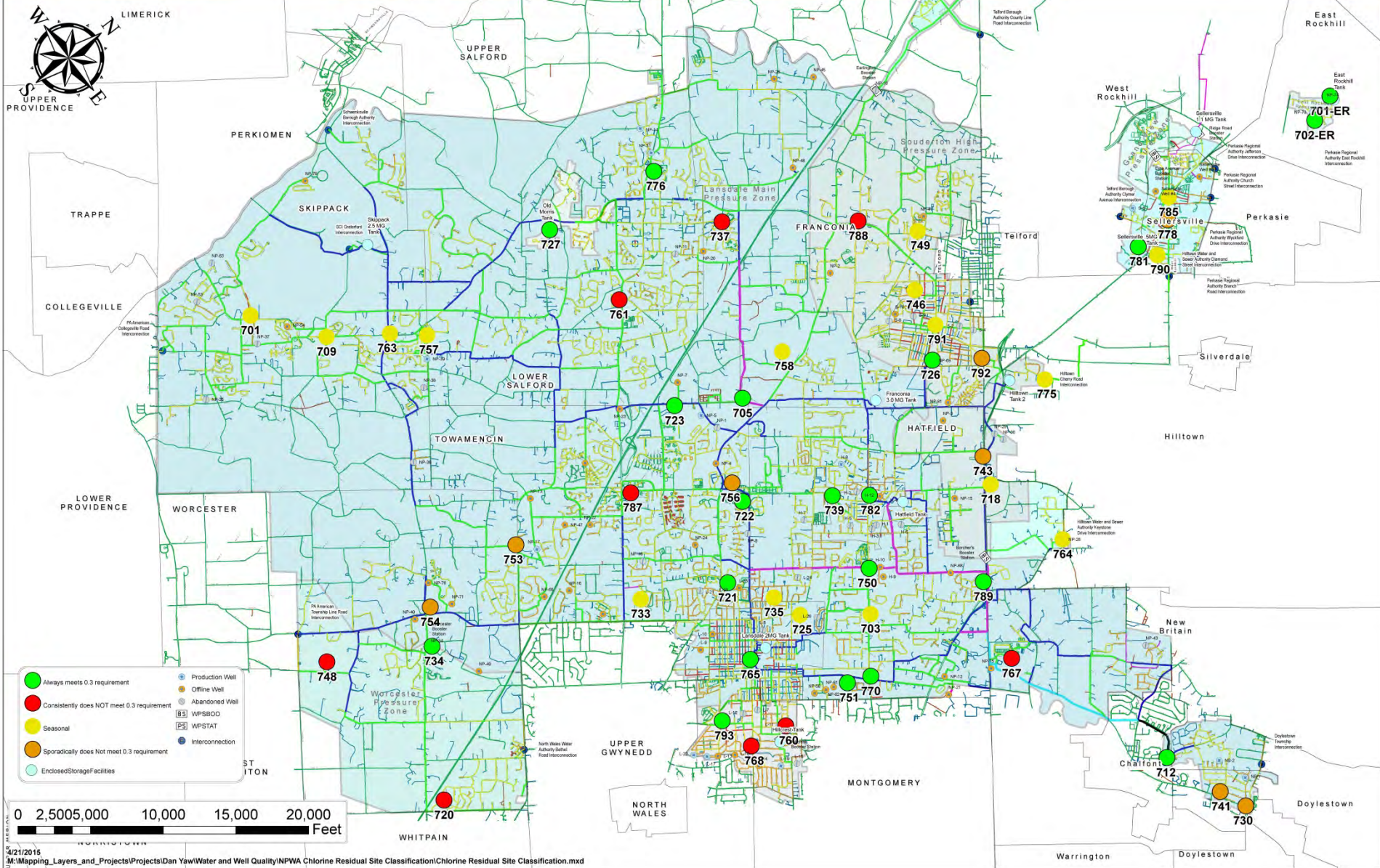
Year	Total Number of Samples	Number of Samples <0.30 mg/L	Number of Total Coliform + Samples	Number of E. Coli + Samples	Average System Chlorine Residual
2013	1,208	248	1 (Cl ₂ = 0.71)	0	0.59
2014	1,193	186	0	0	0.62
2015 YTD	395	5	0	0	0.79
TOTALS	2,796	439	1	0	0.66

What is the Impact?

- 15% of samples taken over last 2.5 years are below 0.30 ppm of free chlorine residual
- Based on proposed revisions, NPWA would have had a Tier II violation triggering on average a **PN every 2 days!!!!**



NPWA Chlorine Residual Site Classification



What is the impact?

- Why We Monitor for HPC
 - A valuable test to help identify problem areas where bacteria regrowth could occur.
 - Anything <500 MPN/ml is considered in compliance and is an indicator of good conditions in the distribution system.
- All samples collected and monitored for HPC since 2013 have had an HPC <500 . Since 2013, NPWA has had 92% of 2,713 HPC samples <20 , 99% <50 , and 100% <400



Conclusions

- NPWA has a peer-recognized high performing water distribution system that consistently provides high quality, safe drinking water.
- The proposed revisions as-written would trigger an absurd level of PN's for water which is already safe.
- Excessive and unneeded PN's are in direct contradiction to what the RTCR is trying to prevent.



Conclusions (cont'd)

- Unnecessary PN's create a burden on DEP regional staff and will erode consumer confidence.
- Heterotrophic Plate Count (HPC) is a valid method for measuring potential bacteriological activity in water and should not be eliminated.
- HPC should continue to be used as part of a wholistic approach to water quality management.



Conclusions (cont'd)

- Solutions to attempt to meet these revisions as written will include SUBSTANTIALLY INCREASING chlorine dosages triggering taste and odor complaints.
- Larger systems will need to SUBSTANTIALLY INCREASE chlorine dosage amounts to maintain 0.30 mg/L residual 100% of the time. This will increase DBPs and could be an issue for many water systems.



Conclusions (cont'd)

- There is not a direct correlation between chlorine residual level and presence/absence of bacterial activity in the distribution system.
- Management and control of bacteriological activity in the distribution system should be a BMP approach with chlorine residuals being part of that but not the deciding factor.



Conclusions (cont'd)

- Implementing BMPs coupled with detectable chlorine residuals, the absence of Total Coliform positives and consistently low HPC are the best indicators to date that the distribution system water quality is being managed appropriately.
- Any PA-DEP regulatory revisions that go above and beyond what EPA is requiring should have the science, data and stakeholder input needed to ensure workable solutions that make sense.
- Preliminary analysis indicates that the cost to comply will be significant.



Conclusions (cont'd)

- More dialogue and stakeholder input is needed!
- Don't use a sledgehammer to kill a bug!



*Committed
to
Excellence*

From the source to the tap



Questions?

