



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Safe Drinking Water

Proposed Revised Total Coliform Rule (RTCR)

Small Water Systems
Technical Assistance Center Board
Meeting

April 30, 2015

Meeting Objectives

- Review key provisions of the proposed Revised Total Coliform Rule (RTCR) regulations, including clarifications to other sections of Chapter 109 for primacy.
- Provide background and justification for proposed revisions.
- Answer questions from TAC.

Timeline

- Proposed rulemaking presented to EQB on April 21, 2015.
- Expect proposed rule to be posted for public comment by the end of Summer 2015.
 - 60 day public comment period
 - 2 public meetings

➤ TAC Comments on Pre-Draft Language

Revisions made in response to TAC Comments:

- Added examples of DEP-directed assessments.
- Allow routine coliform sample locations to be repeated.
- Allow 5 working days to repair on-line monitoring or recording equipment.
- Clarified filter bed evaluation language.

▶ TAC Comments on Pre-Draft Language

Revisions made in response to TAC Comments:

- Revised requirement for automatic shut-down capability.
- Revised entry point disinfection requirements.
- Deleted source sampling provision.
- Moved auxiliary power provision to preamble to request public comment.

Key Provisions

RTCR

- Monthly monitoring
- Repeat monitoring locations
- Public Notice

Disinfection

- Entry Point residual
- Log inactivation reporting
- Distribution system residual

Key Provisions (cont.)

Filtration

- Turbidity requirements
- Alarms and automatic shutdown capabilities

Source Protection/Permitting

- Source assessment
- New source sampling

Monthly Monitoring

- Require monthly monitoring for all systems.
- More protective of public health for NCWS to monitor monthly.
- Under federal rule, many NCWS would trigger (and remain on) monthly monitoring.
- No follow up sampling during the month after a positive result.

Repeat Monitoring Locations

- Proposed language retains the existing requirement to collect repeat samples within 5 service connections up- and downstream of the routine coliform-positive sample location.
- Purpose is to identify whether initial positive result was caused by a condition unrelated to water quality in the distribution system.

Alternative Monitoring Locations

- Federal RTCR gives States an option to allow alternative monitoring locations for repeat monitoring.
- DEP is requesting comments on how a PWS would demonstrate that an alternate repeat monitoring location represents the pathway for contamination *that led to the original coliform-positive sample*.

Public Notice & 1-Hour Reporting

- Failure to submit Assessment Report or Certification of Start-Up Procedures is a Tier 2 violation to be consistent with existing regulations.
- 1-hour reporting required for *E. coli*-positive sample result to be consistent with existing regulations.

Entry Point Disinfection

- Pre-draft language proposed requiring minimum entry point disinfectant residual levels of 0.50 mg/L free chlorine and 1.00 mg/L total chlorine. *This provision was deleted.*
- Proposed language requires PWSs with filtration to calculate and report log inactivation values.

Disinfection Standards - Other States

State	Minimum Distribution System Residual (mg/L)
Alabama	0.2 (free)
California	0.2 (free)
Delaware	0.3 (free)
Florida	0.2 (free), 0.6 (total)
Georgia	0.2 (free)
Illinois	0.3 (free), 0.5 (total)
Indiana	0.2 (free), 0.5 (total)
Iowa	0.3 (free), 1.5 (total)
Kansas	0.2 (free), 1.0 (total)
Kentucky	0.2 (free), 0.5 (total)

State	Minimum Distribution System Residual (mg/L)
Louisiana	0.5 (free or total)
Missouri	0.2 (total)
Nebraska	0.2 (free), 0.5 (total)
North Carolina	0.2 (free), 1.0 (total)
Ohio	0.2 (free), 1.0 (total)
Oklahoma	0.2 (free), 1.0 (total)
Tennessee	0.2 (free)
Texas	0.2 (free), 0.5 (total)
West Virginia	0.2 (total)

Distribution Disinfection Residual

Existing methods for measuring chlorine may not be accurate at low levels.

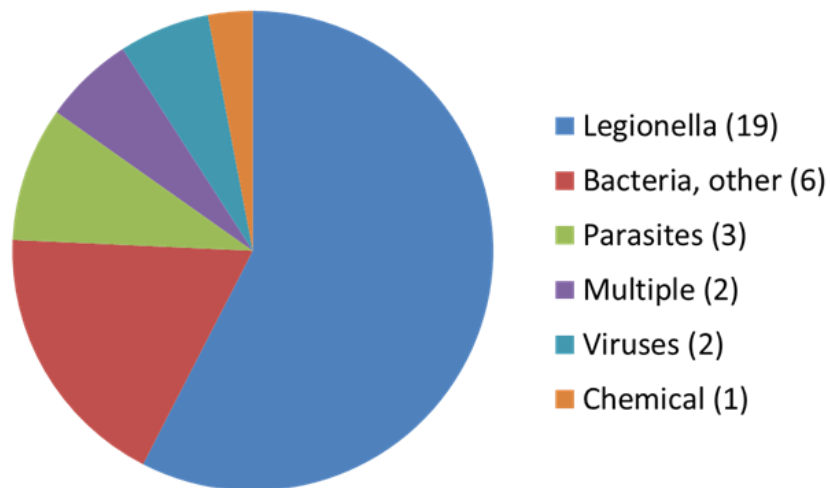
- Manganese reacts with DPD resulting in positive interference for free chlorine.
- Natural organics react with DPD forming a complex that results in positive interference with total chlorine.
- Some studies show actual detection limit for DPD method is greater than 0.02.

Distribution Disinfection

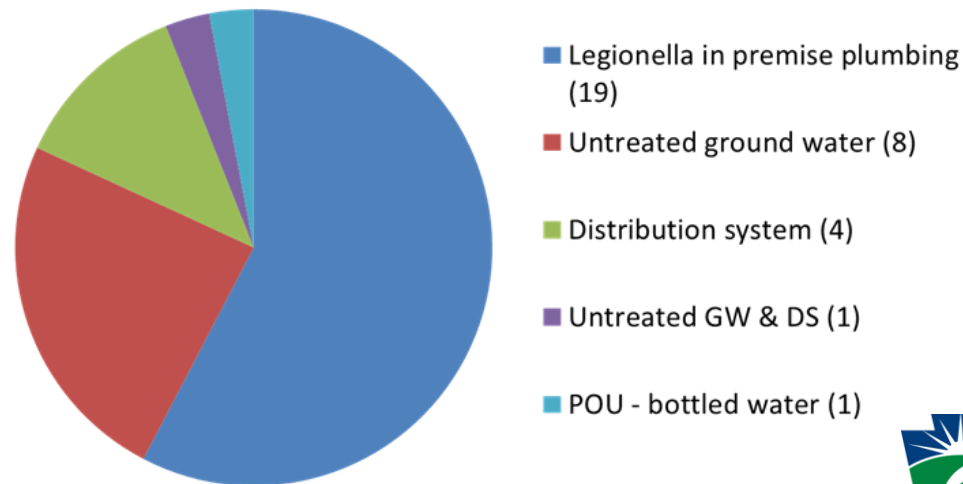
- Provides additional public health protection from pathogens.
- Existing requirements may not adequately protect against microbial contamination in the distribution system.
 - 851 waterborne disease outbreaks were reported in the U.S. from 1971-2010.
 - Disease outbreaks continue to be associated with contaminated sources, treatment issues and distribution system deficiencies.

National Waterborne Disease Outbreaks

Outbreaks (N=33)



Outbreaks (N=33)

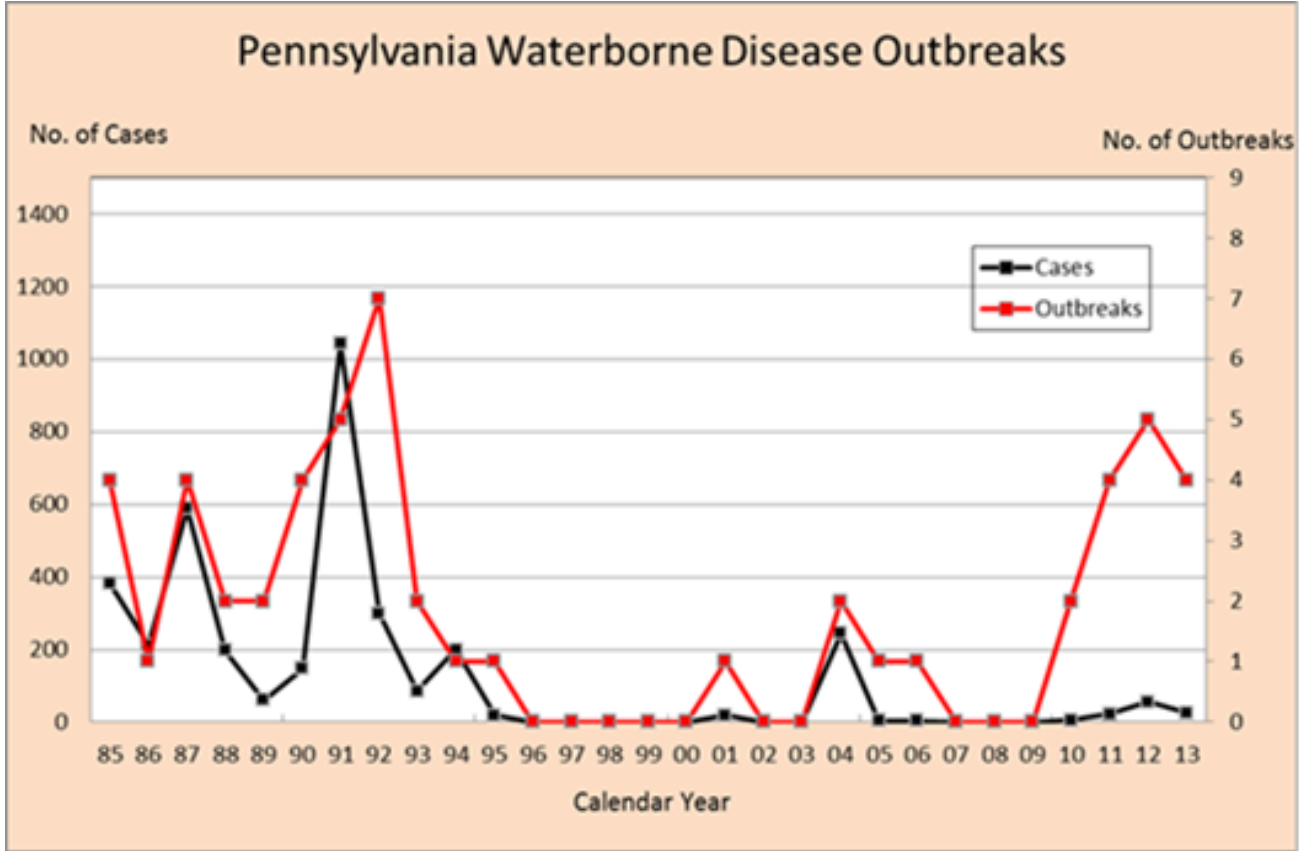


▶ National Waterborne Disease Outbreaks

Regarding the incidence of distribution system deficiencies and waterborne disease outbreaks:

- Distribution system and premise plumbing deficiencies continue to be a major contributor to outbreaks.
- The distribution system is the remaining component yet to be adequately addressed in national efforts to eradicate waterborne disease.

PA Waterborne Disease Outbreaks



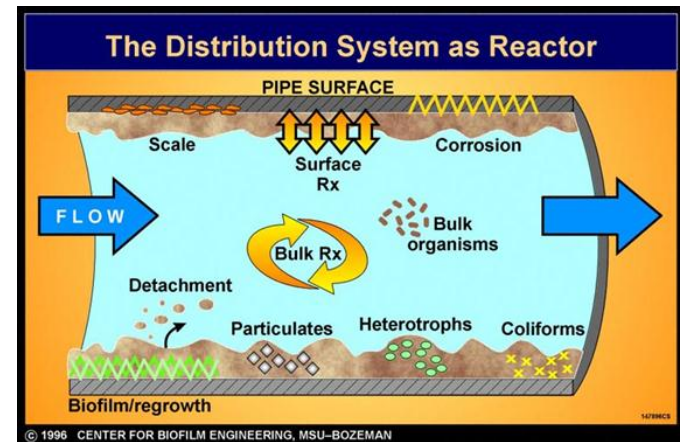
Legionella

- Causes Legionnaires' Disease (pneumonia) and Pontiac Fever.
- Are ubiquitous in water.
- Are persistent, flourish in biofilms, and can survive over a wide range of temperatures.
- *Can be present even when water meets current safe drinking water standards.*

Challenges Associated with Legionella

Legionella can colonize and multiply within water mains due to:

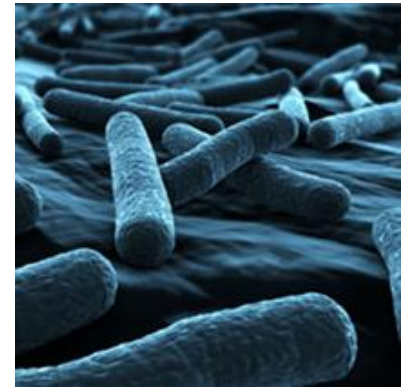
- Lack of disinfectant residual
- Excessive water age and residence times
- Ideal water temperatures (25 - 42°C)
- Presence of nutrients, sediment and biofilms.



Pathways of Contamination

Pathogens can be introduced into potable water lines through:

- Treatment breakthrough
- Cross connections and backflow
- Leaking pipes, valves, joints and seals
- Water line breaks, repairs, and new construction
- Storage tanks



▶ Current Knowledge of Control Measures

Legionella control may involve multiple approaches, such as:

- Finding and fixing sanitary defects to limit entry of pathogens (as required under the RTCR).
- Improving hydraulics and water quality to control biofilms.
- Implementing effective O&M and BMPs.
- Maintaining adequate disinfectant residuals.

Distribution Disinfection Residual

- Ensure adequately disinfected water is delivered to all customers
- Establish a comprehensive treatment technique that will drive the need for better operations and BMPs, which will improve overall water quality
- Make Pennsylvania consistent with Ten States' Standards.

Distribution Disinfection Residual

- Proposed language requires 0.30 mg/L free chlorine or 0.50 mg/L total chlorine.
- Failure to maintain minimum disinfectant residual at any location is classified as a Tier 2 Treatment Technique violation.
- PA records indicate the majority of PWSs will be able to comply with disinfection provisions by optimizing distribution system operations.

Simultaneous Compliance

Simultaneous compliance issues are a concern with distribution disinfection provisions:

- Increased residual requirements could lead to increased disinfection byproducts.
- Systems should be able to meet the new standards through better operations and BMPs, which will reduce chlorine demand and improve overall water quality.

Filtration – Turbidity Provisions

- Add turbidity standards for membrane plants.
 - Instantaneous maximum of 1.0 NTU
 - PLR of 0.15 NTU in 95% of measurements
- Require continuous monitoring for CFE and require continuous IFE monitoring / reporting for all filtration types.
- Lower IFE trigger levels to be consistent with CFE performance levels.

Alarms and Shutdowns

- All filter plants will need alarms for key operational parameters.
- Unmanned plants will also need automatic shutdown capabilities.
- Testing of plant shutdown capabilities may be simulated.
- PWS without existing capabilities will have 1 year from date of final regulation, to comply.

Auxiliary Power

Pennsylvania is susceptible to natural disasters, which can lead to massive and extended flooding and/or power outages.

- In 2011, storms caused flooding, water line ruptures, and power outages resulting in mandatory water restrictions & resulting boil water advisories that impacted 32 PWSs.
- In 2012, 1 storm caused similar problems that affected 85 PWSs.

Auxiliary Power

DEP is requesting comments specifically about:

- Costs incurred by PWSs that have installed auxiliary power.
- The primary components of the PWS that are necessary for effective operation of the system.
- Pros & cons of different options for generators.
- Alternatives that are available to PWSs to ensure that safe and potable water is continuously supplied to users.

Source Protection

- Expand WHPP to be Source Water protection (to include SW sources).
 - New definitions for: *source water assessment, source water protection, source water protection program, surface water intake protection area and surface water intake protection program*
- Require updated source water assessment by PWS if annual system evaluation identifies changes to potential source(s) of contamination.

New Source Sampling & Permitting

- Require pre-drilling plan, including source water assessment, and where necessary, SWIP testing *prior to* source approval for new GW sources.
- Require 1st round of *Cryptosporidium/E. coli* monitoring prior to approval for new SW or GUDI sources.

Expected Benefits

- The avoidance of health effects from the consumption of contaminated drinking water.
- The continuity of a safe and adequate supply of potable water.
- Increased protection of public drinking water sources.



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QUESTIONS?

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