Update on the Revised TCR and Potential Distribution System Rule - What to Expect When

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Background (and acronyms!)

- USEPA published intent to revise the Total Coliform Rule (TCR) in 2003.
- Formed a Federal Advisory Committee called the Total Coliform Rule/Distribution System Advisory Committee (TCRDSAC) in 2007.
  - Charge was to develop an Agreement in Principle (AIP)
    - Recommended revisions to the TCR and
    - What information about distribution systems is needed to better understand and address possible public health impacts from degradation of distribution system water quality….

TCRDSAC Charge (con't)

- TCR
  - Revisions to improve implementation while maintaining or improving public health protection
  - AIP signed in September, 2008
- Distribution Systems
  - USEPA formed a Research and Information Collection Partnership (RICP)
  - Data needs, research needs, and/or risk management strategies to better inform distribution system contamination occurrences and associated public health risks
  - Research Priorities unveiled **Tuesday (May 11, 2010)**

Revisions to the TCR

Revised Total Coliform Rule (RTCR) Agreement in Principle

- Represents a shift from monitoring to pro-active investigation and correction of problems
- Important elements:
  - Elimination of non-acute Total Coliform (TC) violation
  - TC positives trigger an assessment and corrective action, if required

Proposed Changes in RTCR

Category	Retain from Current TCR	Modify from Current TCR
Indicators	Total Coliform, *E. coli*	Eliminate Fecal Coliform
MCLG	*E. coli* (zero)	Eliminate Total Coliform and Fecal Coliform MCLG
Level 1 & 2 Assessment Triggers	N/A	• Non-acute MCL definition • Part of Treatment Technique
Violations	• Acute for *E. coli* with confirmation • M & R	• *E. coli* MCL Violation • Eliminate non-acute monthly MCL (current 5% trigger retained for action) • Treatment Technique Violation - Failure to take triggered action • M&R
Variance	•Biofilm	• Since no longer TC MCL, variance may not be appropriate

Proposed Changes in RTCR (2)

Category	Retain from Current TCR	Modify from Current TCR
Monitoring	Number of samples for systems >1,000	Criteria to allow small systems (< 1,000) to perform quarterly or annual monitoring
Repeat Samples	3 samples	• Eliminate requirement of 5 connections upstream & downstream of original site • Eliminate requirement to take 4 repeats for small systems
Sample Siting Plan	Requirement to develop plan	• System is responsible for developing SOP for repeat sample sites • Subject to primacy agency review
Public Notification	3 Notification Tiers	•Tier 1 – for *E.coli* MCL violation •Tier 2 – for Treatment Technique TT violation (failure to do assessment or corrective action) •Tier 3 – for Routine Monitoring or Reporting Violation

Overview of Assessments

- Purpose is to identify defects in coliform monitoring practices as well as “sanitary defects”, defined as:

  “a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place.”

- Responsibility for conducting assessment belongs to the utility
- Assessments must be conducted as soon as practicable after notification of monitoring results
- Level 1 and Level 2

Level 1 Assessment Triggers

- Level 1 Trigger reached when:
  - 5% of TC samples in one month are positive (systems taking 40 or more samples)
  - 2 TC samples in one month are positive (systems taking fewer than 40 samples)
  - Failure to take every repeat sample following an initial positive TC sample

Level 2 Assessment Triggers

- *E. coli* MCL violation
- Failure to collect every repeat sample following an initial *E. coli* positive sample ("*E. coli* monitoring violation")
- A second Level 1 trigger within a 12-month period
  - Unless the primacy agency determined a likely reason for the initial Level 1 trigger and establishes that the system has corrected the problem
  - For systems on annual monitoring, a second Level 1 trigger in two consecutive years

Typical Level of Effort for Assessments

- Level 1
  - Basic self-evaluation
  - Using data that should already be available to system
  - Some additional field work including inspection of sample site
  - Level of effort ranges from less than one day to multiple days, depending on the size and complexity of the PWS
  - If sanitary defects were found, provide a description of the corrective action or a timetable for actions not completed

- Level 2
  - More detailed than Level 1, conducted by party approved by State (a certified operator with a minimum of 2 years of experience or an individual with approved equivalent training)
  - Collect additional data beyond what is readily available
  - Conduct extensive field investigations
  - Possibly seek outside expertise or State assistance
  - Level of effort ranges from at least one day to multiple days, depending on the size and complexity of the PWS

Minimum Elements of Assessments (Levels 1 and 2)

1. Inadequacies in sample sites, sampling protocol, and sample processing
2. Atypical events that may affect distributed water quality
3. Changes in distribution system operation and maintenance that may affect distributed water quality, including storage
4. Source and treatment considerations that may impact distributed water quality
5. Existing water quality monitoring data

Question Categories on AIP Forms

Question Categories on Level 1 and 2 Assessment Forms	AIP Element
Q1. Have any atypical events occurred?	2
Q2. Have there been any system changes?	2
Q3. Evaluate sample site	1
Q4. Evaluate sample protocol	1
Q5. Assess distribution system facilities	3
Q6. Assess storage tanks	3
Q7. Assess treatment process	4
Q8. Assess source (well)	4
Q9. Assess source (spring)	4
Q10. Assess source (surface water)	4

In your experience, what are some of the common causes of total coliform and *E. coli* occurrence in distribution systems?

Distribution system:

- Failure to disinfect (or improper disinfection) after maintenance on the distribution system
- Main breaks
- Holes in the tank, inadequate screening, etc. which could allow animals and or fecal matter to enter the tank
- Loss of system pressure
- Lack of regular flushing programs
- Biofilm build-up in the distribution system
- Cross-connections
- Inadequate disinfectant residual
- Flushing of the system dislodges the biofilm
- New water main construction

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State Response to Information Needed to Fill Out Assessment Forms

Examples of records needed from the water system to support the assessment:

- Maintenance logs (WTP equipment, distribution system, tanks, pump stations)
- WTP and distribution system daily operations log sheets (including HS pumpage changes) and water quality data (including C-T and disinfection information)
- Distribution system pressure readings, tank levels and other monitoring data (available primarily from SCADA or telemetry)
- Operational data regarding chloramination: ratios, free ammonia, pH, total chlorine, temperature
- Customer inquiry/compliant logs
- Main break logs
- System flushing logs
- Hydrant use/fire department use records
- Cross-connection inspection logs/backflow device testing (if available)
- Plumbing records (inspections for building plumbing)
- Records of the sampling chronology
- PWS SOPs for sample site selection, sampling, transport
- Weather conditions
- System plans and maps
- Security alarm and video recordings

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Implication for Operations

- Increased need for documentation of operations
- Tracking of historical water quality data
- Increased scrutiny of monitoring and reporting errors
- Working with primacy agency to develop sample siting plans and conduct assessments

Small System Implications

- Ensure that resources are available to conduct assessment in timely manner
  - Staff
  - Additional sampling
  - Supporting data
  - External assistance
- Need to organize and store data for quick and easy analysis during assessment
- Investment in additional monitoring equipment
- Prepare for assessments by doing a trial run

Large System Implications

- Need to prepare SOPs for determining site of repeat sampling
  - Training of sampling staff
- Assign team to assessment duties, may need to reassign staff from other areas temporarily
- Work with primacy agency to determine acceptable formats and data for assessment information

Examples of Possible Corrective Actions Resulting from Assessment

- Backflow prevention
- Sampler training
- Storage tank repairs
- Leak repairs
- Flushing
- Pressure management
- Pipe and tank replacement

Many details to work out regarding Corrective Actions……

Schedule for Proposed Rule

- Proposed rule published in Federal Register in summer/fall, 2010 for public comment
  - 60 day comment period
  - 3 public meetings to discuss proposed Rule are planned
- Final rule summer/fall, 2012
- Rule effective in 2015
- Guidance documents developed throughout the process
  - Assessments and Corrective Actions
  - Sample Siting Plans
  - Revisions to Existing TCR Guidance Documents

Still Many Unknowns…

- Lots could change between proposed and final rules
- Don’t get too hung up on specific details now, but do embrace the principles!

Distribution System Rule??

- No current plans for a Distribution System Rule
- Rather, USEPA developed a Research and Information Collection Partnership (RICP)

Overview of RICP Process

- AIP identified seven research and information collection priority topics
  - Tier one:
    - Cross-connections and backflow of contaminated water
    - Contamination due to storage facility design, operation or maintenance
    - Contamination due to main installation, repair or rehabilitation practices
    - Contaminant intrusion due to pressure conditions and physical gaps in DS infrastructure
  - Tier two:
    - Significance and control of biofilm and microbial growth
    - Nitrification issues that lead to public health effects
    - Accumulation and release of contaminants from DS scales and sediments

Research and Information Collection Partnership (RICP)

- Partners
  - EPA and WaterRF
  - MOU signed on Jan 29, 2009
- Steering Committee (SC) – 9 members
  - 8 meetings/calls between April 2009 and April 2010
  - Identified research and information collection needs
- *Final Priorities of the Distribution System RICP*
  - Document available on EPA's website **soon**
  - Contains 29 project area documents, including 10 that have been designated as high priority

High Priority Project Areas

1. Survey of Large Drinking Water Utility Distribution Systems
2. Epidemiological Studies of Health Effects Associated with Low or Negative Pressure Events in Distribution Systems
3. Quantitative Microbial Risk Assessment (QMRA) to Evaluate Exposure to Pathogens through Drinking Water Distribution Systems
4. Contaminant Entry from Breaches in Storage Facilities

High Priority Project Areas

5. Estimation of Contaminated Water Volumes and Contaminant Concentrations Introduced Into Distribution Systems Due to Backflow Events from Unprotected Cross-Connections Based on Model Predictions and Field and Pilot-Scale Experiments
6. Survey of Distribution System Pressure Management Practices
7. Characterize Propagation of Pressure Events through Water Distribution Systems to Improve Pressure Management Approaches

High Priority Project Areas

8. Targeted Surveys to Obtain Information on State and Local Regulations, Policies, Manufacturing Practices and Guidelines for Distribution Systems
9. Best Practices to Minimize Risks Associated with Cross Connections and Backflow
10. Best Practices for Minimizing Risks Associated with Storage Facilities

Conclusions and Recommendations

- The RTCR *should* result in better information about actual public health risks within the distribution system
- Whether or not a Distribution System Rule is developed, the Assessments and Corrective Actions in the RTCR AIP clearly wrap distribution system O&M practices and water quality conditions into an existing regulation
- Utilities should review and conduct trial runs of assessments and determine resource needs
- Review and comment on Proposed RTCR Rule!
- http://www.epa.gov/safewater/disinfection/tcr/pdfs/tcrdsac/agreementinprinciple_tcrdsac_2008-09-18.pdf

Thank You
and Questions?

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