

Background on Current TCR and Rule Revisions Development

EPA Science Advisory Board
Drinking Water Committee

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Outline

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*** An Appendix containing supplemental information can be found at the end of the presentation*

1. Background on the Current TCR

Background on the Current TCR

- Published 1989, effective 1990
- The only microbial drinking water regulation that applies to all public water systems (PWSs).
- Rule objectives:
 - help ensure the integrity of the distribution system,
 - indicate effectiveness of treatment, and
 - indicate possible fecal contamination.
- Rule sets health goals (MCLG) and legal limits (MCL) for total coliforms (TC). Presence of fecal coliforms or *E. coli* with TC (+) samples determines acute MCL violations.
- Regular monitoring for microbial indicators is used to determine PWS success in meeting water quality goals

Current TCR requirements

- Requirements apply to all PWS*
 - 53,000 community water systems (CWS)
 - 19,000 non-transient non-community water systems (NTNCWS) – schools, factories, etc.
 - 86,000 transient non-community water systems (TNCWS) – restaurants, gas stations, parks, etc.
- One of few rules that apply to transient PWSs
 - Monitoring quarterly for most; annually or monthly for others
 - Sanitary surveys by states (every 5 or 10 years)
 - Rule fosters interactions between system and State
- Public Notification (PN) requirements for both acute and non-acute (monthly) violation.

**See Table 1 in Appendix for detailed information on PWS inventory.*

Current TCR Monitoring Requirements

- The minimum number of routine samples required per month vary based on the number of people served (see Table 2 in Appendix)
- Reduced monitoring allowances for groundwater systems:
 - Small NCWSs ($\leq 1,000$) start at quarterly but may monitor as little as annually if there are no sanitary defects in a sanitary survey
 - Small CWSs ($\leq 1,000$) start at monthly but may monitor as little as quarterly with protected sources, no history of TC contamination, and no sanitary defects in a sanitary survey conducted in the past 5 years
- Repeat and additional routine samples
 - For each TC (+) sample, the system must collect 3-4 repeat samples.
 - Small systems ($\leq 4,100$) must also collect up to 5 additional routine samples the following month

2. Issues Driving the Revisions

Issues Driving the Revision..

EPA concerns and stakeholder comments suggested reassessment of TCR requirements in three main issue areas:

1. Public Health Protection

- Appropriate use of total coliforms (TC) and *E. coli* as public health indicators for MCLs

2. Effectiveness of Monitoring Requirements

- Sampling locations, frequency, and burden

3. Follow-up or corrective action strategies

- PN requirements for TC violations are confusing and cause unwarranted concern
- Corrective action is not required for violations

History of TCR Revision

- EPA is required to review and revise, as appropriate, each National Primary Drinking Water Regulation no less often than every 6 years
- The net effect of the rule must be to maintain or improve public health protection
- In 2003 EPA published its intent to revise the TCR
- Between 2003 and 2007 EPA and industry experts conducted workshops and developed issue papers
- In July 2007, EPA convened a Total Coliform Rule Distribution System Federal Advisory Committee (TCRDSAC), representing 15 organizations

3. Total Coliform Rule/Distribution System Advisory Committee (TCRDSAC)

TCRDSAC Process

- Purpose of Committee was to recommend revisions to the TCR and consider distribution system issues.
- Met 13 times - July 2007 through September 2008
- A Technical Work Group provided technical support and data analyses to inform perspectives on the various rule recommendations that were considered
- Compiled, analyzed, and discussed:
 - TC occurrence data, system inventories, violation data, state and system responses to violations, and cost information
- Deliberated on initial proposals and ideas from advisory committee members
- TCRDSAC applied 10 criteria in considering the proposals and ideas.

TCRDSAC Criteria for the Revised TCR

1. Meets the objectives of the current rule
2. Maintains or enhances public health protection
3. Reduces burden
4. Is cost effective
5. Is simpler to implement
6. Considers implications and linkages to other rules
7. Reflects variations in system size and type
8. Recognizes the value of effective operators
9. Uses the optimal indicator for each purpose or objective
10. Is supported by scientific data.

TCRDSAC Deliberation of Issues (1)

Areas of early general agreement:

- Capture the activities currently implemented by proactive systems and states:
 - Establish a Treatment Technique approach to require systems to find-and-fix sanitary defects
- Eliminate the PN requirement associated with only TC detection
- Keep the MCL and PN requirements for *E. coli*

TCRDSAC Deliberation of Issues (2)

Other areas of early general agreement.

- Hold small systems on reduced monitoring accountable:
 - Require them to demonstrate continuing eligibility
 - The criteria for eligibility recognize the value of state site visits, sanitary survey results, and compliance history,
 - Establish criteria for states to increase monitoring for high-risk systems
- Provide flexibility in the sampling locations for repeat monitoring
- Reduce the number of repeat samples required for small systems

TCRDSAC Deliberation of Issues (3)

Further deliberations were needed to agree on:

- Small system requirements
 - Number of samples for baseline routine monitoring
 - Number of samples for additional routine monitoring in the month following a TC(+) occurrence
- Transition to the revised rule
- State discretion in allowing reduced monitoring
- Seasonal systems
- The level and details of the Treatment Technique assessment and corrective actions

TCRDSAC Deliberation of Issues – Overall Assessment

The TCRDSAC believes that the recommendations for changes to the TCR, as described in the AIP, provide for a revised rule that is at least as protective of public health and that addresses EPA and stakeholder concerns regarding the current rule.

3.a. Agreement in Principle

Core AIP Elements (1)

- 1. The Revised TCR would require systems to investigate and correct any sanitary defects found whenever monitoring results show a system may be vulnerable to contamination.**
 - 2. Systems would be required to conduct a simple self assessment (Level 1) or a more detailed assessment by a qualified party (Level 2) depending on the severity and frequency of contamination.**
- *Improve public health protection by capturing the find-and-fix activities currently implemented by proactive systems and states*

Core AIP Elements (2)

3. **The Revised TCR would establish a Treatment Technique in place of MCL/MCLG for TC, with PN only for Treatment Technique violations (failure to find-and-fix)**
 4. **The Revised TCR would keep E. Coli as a health indicator based on an MCL (2 TC+ and at least one related EC+) and MCLG of zero**
- *Provide appropriate follow-up and corrective action strategy by use of TC as a system operation indicator*
- *To reflect increased understanding of the use of TC as an indicator*
 - *To address system costs and consumer confusion and mistrust with PN associated solely with TC detection.*

Core AIP Elements (3)

- 5. The Revised TCR would provide criteria that well-operated small systems must meet to qualify and stay on reduced monitoring**
- Criteria: clean sanitary survey, clean compliance history for two years. NCWS on reduced annual monitoring must have an annual site visit.
 - Additional criteria: CWS must have at least one. For NCWS, at least one from 2-6 are recommended.
 1. Annual site visit (or Level 2 assessment)
 2. Cross connection control program
 3. Operator certification
 4. Continuous disinfection
 5. 4-log inactivation of viruses
 6. Other enhancement as approved by primacy agency

Core AIP Elements (4)

- 6. The Revised TCR would requiring increased monitoring for high-risk small systems with unacceptable compliance history or significant non-compliance**
- Triggers that would require small systems monitoring less than monthly to increase to monthly monitoring:
 - A triggered Level 2 assessment
 - An E.Coli MCL violation
 - A violation of the Treatment Technique of the Revised TCR (failure to “find-and-fix”)
 - Two routine monitoring violations in a rolling 12 month period (quarterly monitoring) or one routine monitoring violation (annual monitoring)

Core AIP Elements (5)

Core Elements 5 & 6:

- *Improve public health protection by holding small systems on reduced monitoring accountable, requiring them to demonstrate continuing eligibility, and requiring increased monitoring for at-risk small systems*
- *Improve public health protection by providing for a higher level of state involvement when systems are on reduced annual monitoring*

Core AIP Elements (6)

- 7. The Revised TCR would keep some monitoring requirements and change others:**
- No changes to the routine sampling structure
 - Reduce the required number of repeat samples for small systems
 - Reduce the required number of additional routine samples for small systems ($\leq 1,000$ people) that sample less than monthly
 - Eliminate the additional routine sample requirement for small systems ($\leq 4,100$ people) that sample monthly or more
- *Improve effectiveness of monitoring requirements by balancing public health gains from proactive find-and-fix requirements with reduced sampling requirements*

Core AIP Elements (7)

- 8. The Revised TCR would provide flexibility in the location of sites for repeat samples beyond 5 sample taps up and downstream of TC(+) location**
 - 9. The Revised TCR would specifically allow the use of dedicated sampling sites instead of premises**
- *Improve effectiveness of monitoring requirements by providing options for the locations of monitoring sites*

Core AIP Elements (8)

10. The Revised TCR would require start-up procedures and sampling during high vulnerability periods for seasonal systems

➤ *Improve public health protection by establishing new requirements that reflect the unique nature of seasonal systems*

11. To reduce state burden, the Revised TCR would allow systems to transition into their current monitoring frequency, to be re-evaluated at each sanitary survey cycle

3.b. Comparison of Current TCR and AIP

Comparison of Current TCR and AIP Rule Construct

Current Rule	AIP
TC MCLG of zero	No MCL/MCLG for TC
TC monthly MCL based on the number of TC+ samples/month	
Fecal coliform/ <i>E.coli</i> acute MCL based on FC/EC+ samples	<i>E.coli</i> MCLG of zero; acute MCL Fecal coliform is not used
PN required for monthly and acute MCL violations	PN not required for only TC occurrence. PN associated with a Treatment Technique (TT) violation (assessment or corrective action do not occur)

Comparison of Current TCR and AIP Routine Monitoring

Current Rule	AIP
1 sample/quarter for GW NCWS \leq 1,000	Same as current TCR, with more explicit criteria to qualify for reduced monitoring
1 sample/month for SW NCWS \leq 1,000 and all CWS \leq 1,000	
For all PWS $>$ 1,000, sampling is monthly based on population	
Provisions for reduced monitoring for all GW PWS \leq 1,000	

Comparison of Current TCR and AIP Assessments

Current Rule	AIP
None required	Level 1 (self assessment) trigger based on current TC MCL level or if PWS fails to take every repeat sample after a TC+
	Level 2 - detailed assessment by State or State-approved 3 rd party or PWS; triggered by an <i>E.coli</i> MCL or monitoring violation or by frequent Level 1 triggers
	Assessment results and description of corrective action taken will be submitted to the State within 30 days

Comparison of Current TCR and AIP Corrective Action

Current Rule	AIP
None required	System must correct all sanitary defects found in the assessment
	If none found, state must be satisfied with the assessment
	Sanitary defect: “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”

Comparison of Current TCR and AIP Violations and PN

Current Rule	AIP
Tier 1 PN – Violation of EC/FC MCL (acute violation)	Same as current, except failure to take repeat samples after EC+ is also an acute MCL violation (both trigger a level 2 assessment and corrective action)
Tier 2 PN – Violation of monthly TC MCL	Monthly TC MCL violation is dropped. Tier 2 PN is required for a TT violation (failure to conduct assessment and/or corrective action)
Tier 3 PN – Monitoring & Reporting Violations	Monitoring and Reporting violations will be tracked separately
PWS must notify State regarding single EC/FC+ result	EPA will request comment on proposed PN language that reflects TC as an indicator and new TT provisions of the RTCR.

4. *Alternative Analysis*

Alternative Analysis

- During Options Selection, cost and benefit comparisons were presented
 1. Current TCR
 2. AIP
 3. Alternative Analysis
- Alternative Analysis was completed to provide a different perspective and facilitate comparison of the AIP and the TCR

Core Elements of the Alternative Analysis

- Increase baseline monitoring frequency to monthly, and reduced monitoring frequency to quarterly, for non-community ground water systems
 - Systems would start the increased monitoring requirements at the rule effective date and monitoring would be reduced as systems meet the criteria
- Keep additional routine monitoring requirement the same as
- Keep assessment and corrective action requirements the same as laid out in the AIP

Comments on the Core Elements of the Alternative Analysis

In the TCRDSAC deliberations, representatives of states and systems were strongly opposed to an alternative that included monthly baseline monitoring:

- Increased baseline routine monitoring for NCWS $\leq 1,000$ would significantly increase burdens on systems and states (especially those states currently conducting the monitoring)
- States value annual site visits more than increased monitoring for these small systems

5. Comparison of the Current TCR,
the AIP Option, and the Alternative
Analysis

Comparison of the Current TCR, the AI Option and the Alternative Analysis

- A chart is provided in the background material that compares the core elements of the current TCR, the AIP option, and the Alternative Analysis

6. RTCR Schedule

Schedule for the RTC_R

Develop rule, preamble, and support documents	through June	2009
SAB review	May/June	
NDWAC consultation	May	
Proposed rule	August	2010
Final rule	August	2012

Appendix

Table 1: Public Water System Inventory data (SDWIS/FED - 2005, Fourth Quarter)

System Type		1,000 or less	1,001-10,000	> 10,000	Total
CWS	# of systems	35,517 (22%)	13,017	4,100	52,634
	Pop. served	9,235,319	43,257,943	233,803,382	286,296,644
NTNCWS	# of systems	18,253 (12%)	902	23	19,178
	Pop. served	3,651,750	1,895,831	736,845	6,284,426
TNCWS	# of systems	85,397 (54%)	782	18	86,197
	Pop. served	8,847,216	1,709,623	3,293,662	13,850,501
	Total # of systems	139,167	14,701	4,141	158,009

Table 2: Current TCR Monitoring Requirements

Public Water System ROUTINE Monitoring Frequencies					
Population	Minimum Samples/ Month	Population	Minimum Samples/ Month	Population	Minimum Samples/ Month
25-1,000*	1	21,501-25,000	25	450,001-600,000	210
1,001-2,500	2	25,001-33,000	30	600,001-780,000	240
2,501-3,300	3	33,001-41,000	40	780,001-970,000	270
3,301-4,100	4	41,001-50,000	50	970,001-1,230,000	300
4,101-4,900	5	50,001-59,000	60	1,230,001-1,520,000	330
4,901-5,800	6	59,001-70,000	70	1,520,001-1,850,000	360
5,801-6,700	7	70,001-83,000	80	1,850,001-2,270,000	390
6,701-7,600	8	83,001-96,000	90	2,270,001-3,020,000	420
7,601-8,500	9	96,001-130,000	100	3,020,001-3,960,000	450
8,501-12,900	10	130,001-220,000	120	≥ 3,960,001	480
12,901-17,200	15	220,001-320,000	150		
17,201-21,500	20	320,001-450,000	180		

*Includes PWSs which have at least 15 service connections, but serve <25 people.