TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AGENDA ITEM REQUEST

For Proposed Rulemaking

AGENDA REQUESTED: September 21, 2016

DATE OF REQUEST: September 2, 2016

INDIVIDUAL TO CONTACT REGARDING CHANGES TO THIS REQUEST, IF NEEDED: Sherry Davis, (512) 239-2141

CAPTION: Docket No. 2015-1532-RUL. Consideration for publication of, and hearing on, proposed amended Sections 290.38, 290.42, 290.46, 290.47, 290.102 – 290.104, 290.106 – 290.119, 290.121, 290.122, 290.272, and 290.275 of 30 TAC Chapter 290, Public Drinking Water.

The proposed rulemaking would incorporate the new federal Revised Total Coliform Rule (RTCR) requirements; address comments from the United States Environmental Protection Agency regarding state implementation of the federal Ground Water Rule; clarify state implementation of the federal Lead and Copper Rule, Total Organic Carbon Rule, and Public Notification Rule; clarify the state monitoring requirements for nitrite during a compliance period and compliance cycle; amend state analytical requirements as required under the federal RTCR; clarify and streamline existing state rules; and would make other minor changes for internal consistency, grammatical correction, and compliance with Texas Register Requirements. (James Beauchamp, Ruth Takeda) (Rule Project No. 2015-035-290-OW)

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Copy to CCC Secretary? NO X YES

Texas Commission on Environmental Quality
Interoffice Memorandum

To: Commissioners **Date:** September 2, 2016

Thru: Bridget C. Bohac, Chief Clerk
Richard A. Hyde, P.E., Executive Director

From: L'Oreal Stepney, Deputy Director
Office of Water

Docket No.: 2015-1532-RUL

Subject: Commission Approval for Proposed Rulemaking
Chapter 290, Public Drinking Water
Revised Total Coliform Rule Plus (RTCR Plus)
Rule Project No. 2015-035-290-OW

Background and reason(s) for the rulemaking:
Under 40 Code of Federal Regulations (CFR) §142.10, the Texas Commission on Environmental Quality (TCEQ) must adopt rules at least as stringent as the federal rules to maintain primacy over the Public Water System Supervision Program in Texas. The federal Revised Total Coliform Rule (RTCR) was promulgated by the United States Environmental Protection Agency (EPA) on February 13, 2013. The RTCR increases public health protection through the reduction of potential pathways of entry for fecal contamination into the distribution system of public water systems (PWSs). This rulemaking proposes to amend existing state rules in 30 Texas Administrative Code Chapter 290 for consistency with the RTCR, align current state rules with federal regulations and to clarify and streamline additional existing state rules.

Scope of the rulemaking:
The proposed amendments will revise Chapter 290, §§290.38, 290.42, 290.46, 290.47, 290.102 - 290.104, 290.106 - 290.119, 290.121, 290.122, 290.272, and 290.275, to provide rule language that is consistent with the RTCR, including the EPA's primacy revision crosswalk (Crosswalk). The EPA's Crosswalk details the rule requirements of the RTCR and provides a tool to compare the federal and proposed state regulations. The proposed amendments provide consistency with other federal provisions and address the EPA's comments on the federal Ground Water Rule (GWR), and provide clarification for existing state rules.

A.) Summary of what the rulemaking will do:
This rulemaking proposes to amend Chapter 290 for consistency with the RTCR and address the EPA's comments on the GWR.

Additionally, this rulemaking proposes to align current state rules to provide consistency and updates for other federal provisions including:

- Lead and Copper Rule (LCR);
- Total Organic Carbon (TOC) Rule;
- Public Notice (PN) Rule requirements;
- disinfection and analytical requirements for chlorine dioxide and chlorite; and
- other federal monitoring and reporting requirements concerning TOC and submission of laboratory analyses and reports to the executive director.

This rulemaking also proposes to amend Chapter 290 to provide clarification and streamline existing state rules including:

- disinfection treatment and monitoring requirements for PWSs that utilize a groundwater source;
- PWS ownership reporting requirements;
- boil water notice (BWN) reporting and requirements for special precautions, protective measures, BWNs, and special investigation requirements for elevated turbidity levels and for failure to provide compliance data;
- nitrite monitoring requirements;
- disinfection operating reports;
- continuous turbidity monitoring and reporting requirements; and
- well recordkeeping requirements.

B.) Scope required by federal regulations or state statutes:

RTCR

TCEQ is proposing amendments to Chapter 290 to provide rule language that is consistent with the RTCR, including the EPA's Crosswalk. The EPA's Crosswalk details the federal rule requirements of the RTCR and provides a tool to compare the federal and proposed state regulations.

The following provisions are being proposed to be consistent with the RTCR.

- Add definitions in accordance with 40 CFR §141.2.
- Specify requirements concerning the maximum contaminant level (MCL) for *Escherichia coli* (*E. coli)* and identify the best technology, treatment techniques, or other means available for achieving compliance with the MCL for *E. coli* in accordance with 40 CFR §141.63.
- Update monitoring, reporting, and recordkeeping requirements concerning the *E. coli* MCL and treatment technique violations, approved seasonal system start-up procedures, microbial sampling, and assessments in accordance with 40 CFR §141.405(b)(4) and §141.861(b).
- Establish that the executive director cannot grant variances and exemptions from the MCL for *E. coli* and treatment technique requirements in accordance with 40 CFR §141.4.
- Specify the coliform sampling requirements and clarify the MCL goals (*E. coli*) for microbiological contaminants in accordance with 40 CFR §141.52 and §141.853.
- Update the PN requirements to include the form, manner, and frequency of notice in accordance with 40 CFR Part 141, Subpart Q.
- Establish and clarify that all PWSs will be required to measure residual disinfectant concentrations within their distribution system in accordance with existing residual disinfectant monitoring requirements in addition to measuring residual disinfectant concentrations at the same time and place that their monthly total coliform samples are collected in accordance with 40 CFR §141.74(c)(3)(i) and §141.132.
- Establish treatment technique violations, associated corrective actions, compliance determinations, and that PWSs are required to ensure that Level 1 and 2 assessments are conducted to identify the possible presence of sanitary defects

and defects in distribution system coliform monitoring practices in accordance with 40 CFR §141.859.

- Clarify and include the updated federal analytical methods which specify that PWSs are required to conduct total coliform and *E. coli* analyses in accordance with the analytical methods or alternative methods in accordance with 40 CFR §141.21 and §141.852.
- Specify that PWSs are required to include repeat in addition to routine microbial monitoring locations in a Sample Siting Plan which shall be included with the PWS's overall monitoring plan. Require PWSs to identify a monthly microbial monitoring schedule and all groundwater sources in the Sample Siting Plan and if these sources are planned for use as repeat microbial monitoring locations in accordance with 40 CFR §141.853.
- Revise the Consumer Confidence Report (CCR) requirements and update the appendices to include new definitions, violations, health effects language, *E. coli* analytical data, and assessment criteria in accordance with 40 CFR Part 141, Subpart O.

GWR

The EPA conducted a primacy review of the TCEQ's adopted GWR revisions, and on March 10, 2014, the EPA provided comments outlining additional revisions needed. TCEQ is proposing to revise Chapter 290 to be consistent with the GWR in response to these comments.

The following provisions are being proposed to be consistent with the GWR.

- Add and update definitions in accordance with 40 CFR §§141.2, 141.400, and 141.402.
- Include the phrase "or other fecal indicator" when referring to *E. coli* to address virus removal required for 4-log treatment in accordance with 40 CFR §141.402 and §141.403.
- Establish and clarify the raw source sampling requirements in the event of an *E. coli* detection at the groundwater source which allows the executive director to either require PWSs to collect an additional five source samples in the event of an *E. coli* detection at the source or to conduct corrective action activities to address the *E. coli* detection in accordance with 40 CFR §141.402 and §141.403.
- Establish that the executive director may approve alternative raw sampling locations at a groundwater source if the sampling location is representative of the water quality of that well source in accordance with 40 CFR §141.402.
- Establish the PN requirements associated with assessment source monitoring for microbial contaminants in accordance with 40 CFR §141.402.
- Clarify the GWR applicability for PWSs in accordance with 40 CFR §141.400.
- Establish and clarify the required corrective actions in the event of an *E. coli*-positive source sample or the identification of a significant deficiency; clarify additional corrective actions required by the executive director; clarify that corrective action is required for triggered source monitoring and deficiencies, but not for assessment source monitoring or portions of a distribution system which is served by a surface water source; clarify corrective action applicability and PN

requirements concerning corrective action to address contamination at groundwater sources when significant deficiencies are identified; clarify and address the utilization of membrane filtration for virus removal; clarify that the discontinuation of 4-log treatment must be made by written request to the executive director; and clarify the notification process in the event a significant deficiency is identified in accordance with 40 CFR §141.403.

C.) Updates to state regulations to be consistent with federal regulations:

LCR

- Establish and clarify the sampling frequency requirements for water quality parameters (WQPs); and clarify that PWSs are required to collect two tap samples for applicable WQPs during each monitoring period from each required number of monitoring sites in accordance with 40 CFR §141.87.
- The proposed rulemaking clarifies the requirements for public education materials and corrects a typographical error in §290.117(i)(4)(B)(i) - (iii) concerning reduced nine-year tap sampling requirements to provide consistency with 40 CFR §141.85.
- The proposed rulemaking establishes the sampling frequency for WQPs in §290.117(e) to provide consistency with 40 CFR §141.87.
- The proposed rulemaking will include additional WQPs parameters in §290.117(e) which are based on EPA's March 2016 *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems* guidance document.
- The proposed rulemaking establishes and provides clarification for PWSs with pre-existing state-approved waivers establishing that the waivers are no longer valid to provide consistency with 40 CFR §141.86 under the Lead and Copper Rule Minor Revisions (LCRMR). The amendment specify that the PWSs that were granted pre-existing waivers are eligible for the reduced nine-year tap water waiver if the system meets the criteria outlined in the LCRMR, and that PWSs are required to re-apply for the waiver every nine years.

TOC

- The proposed rulemaking clarifies how the TOC running annual average is calculated for quarterly drinking water compliance calculations to provide consistency with 40 CFR §141.135(c)(1)(i) - (v).

PN

- The proposed rulemaking clarifies and characterizes the three PN tiers which take into account the seriousness of the violation or situation and any potential adverse health effects that may be involved and provides the definition of each tier and specific PN requirements for each of the three tiers for which the violation or situation applies to provide consistency with 40 CFR §141.201 and §141.202.

Chlorine Dioxide and Chlorite Analytical Requirement

- The proposed rulemaking revises the current analytical requirements to add the EPA approved methods for the analysis of chlorine dioxide and chlorite to provide consistency with 40 CFR §141.131.

Sample Analyses Reporting

- The proposed rulemaking revises and adds language in §§290.102, 290.106 - 290.109, and 290.113 - 290.115 to clarify the reporting requirements for PWSs concerning the submission of laboratory analyses and reports to the executive director to provide consistency with 40 CFR §141.31.

D.) Additional staff recommendations that are not required by federal rule or state statue:

Disinfection

- The proposed rulemaking clarifies the association between Chapter 290, Subchapters D and F disinfection treatment and monitoring requirements for PWSs that use a groundwater source.

Change of Ownership

- The proposed rulemaking clarifies the reporting requirements for PWSs which require the new owner of a PWS to provide notification to the executive director when a change in ownership occurs. Additionally, the reference to Chapter 291 has been removed which relates to the notification requirements by utilities.

BWN

- The proposed rulemaking clarifies the BWN delivery requirements to cross-reference Chapter 290's Subchapters D and F methods regarding PNs. The proposed rulemaking also establishes requirements to rescind a BWN, revises mandatory BWN language, and adds mandatory language to rescind a BWN. The proposed rulemaking also establishes and specifies discretionary actions required by the executive director concerning special precautions, protective measures, and BWNs. The proposed rulemaking will establish requirements by the executive director concerning special precautions, protective measures, BWNs, and special investigations regarding elevated turbidity levels at surface water and groundwater under the influence of surface water treatment systems and for failure by a PWS to submit compliance data for these treatment systems to the executive director.

Nitrate/Nitrite Monitoring

- The proposed rulemaking corrects a typographical error in §290.106(c)(3) regarding the initial monitoring frequency for inorganic compounds except asbestos.

Nitrite Monitoring

- The proposed rulemaking clarifies the monitoring requirements for nitrite in accordance with the term "compliance cycle" as described in §290.103(3) and §290.106(c)(7)(A). In addition, the proposed rulemaking requires all PWSs to monitor for inorganic chemicals at the time designated by the executive director during each compliance period during each nine-year compliance cycle.

Disinfection Level Quarterly Operating Report (DLQOR)

- The proposed rulemaking clarifies the PN requirements for PWSs that use groundwater or purchased water sources and that violate the treatment technique requirements for residual disinfectant levels. The proposed amendments clarify that PWSs that use groundwater sources are required to issue a PN for failing to maintain minimum residual disinfectant levels.

Continuous Turbidity Monitoring

- The proposed rulemaking clarifies the required span of data that the turbidity equipment is required to capture for continuous turbidity monitoring and clarifies that capping the turbidity equipment is a violation. The proposed rulemaking will establish conditions when the executive director requires PWSs to conduct special precautions, protective measures, BWNs, and special investigations regarding elevated turbidity levels at surface water and groundwater under the influence of surface water treatment systems and for failure by a PWS to submit compliance data to the executive director for these treatment systems.

Well Recordkeeping

- The proposed rulemaking will amend §290.46(n)(3) to clarify the record keeping requirements for PWSs concerning well completion data as required by §290.41(c)(3)(A).

Statutory authority:
These amendments proposed under the Texas Water Code (TWC), §5.102, which establishes the commission's general authority necessary to carry out its jurisdiction; TWC, §5.103, which establishes the commission's general authority to adopt rules; TWC, §5.105, which establishes the commission's authority to set policy by rule; and Texas Health and Safety Code (THSC), §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 United States Code, §§300f to 300j-26; and THSC, §341.0315, which requires PWSs to comply with commission rules adopted to ensure the supply of safe drinking water.

Effect on the:
A.) Regulated community:
RTCR and GWR

- The proposed rulemaking to implement federal requirements will affect all PWSs in Texas but does not create a group of affected persons who were not affected previously. The costs to perform these requirements are difficult to estimate and would vary due to the difference and variability in size, type, and configuration of each PWS.

LCR

- The proposed rulemaking will affect all community and nontransient noncommunity PWSs in Texas but does not create a group of affected persons who were not affected previously. This rulemaking will require PWSs to collect two tap samples for applicable WQPs during each monitoring period from each required

number of monitoring sites based on population. These requirements are not expected to result in a significant fiscal impact for the agency or PWSs. Additionally, the proposed rulemaking will require PWSs to sample for WQPs more frequently and will require PWSs to sample for additional WQPs which are based on EPA's March 2016 *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems* guidance document to assist PWSs in further assessing the corrosivity of the water within their distribution system. These requirements are not expected to result in a significant fiscal impact for the agency but are expected to result in a moderate fiscal impact for PWSs.

BWN

- The proposed rulemaking to implement additional staff recommendations will affect all PWSs in Texas but does not create a group of affected persons who were not affected previously. This rulemaking may require PWSs to issue BWNs to customers at the discretion of the executive director in addition to pre-existing requirements. PWSs will also be required to provide boil water rescind notices to customers. These requirements are not expected to result in a significant fiscal impact for the agency or PWSs.

B.) Public:

RTCR

- The impact of the proposed rulemaking upon the public is anticipated to be minimal. The proposed rulemaking may provide a decrease in the number of certain types of PNs issued to customers due to PWSs having more flexibility in PN delivery methods. These cost savings may be offset by potential cost increases if PWSs are required to conduct infrastructure improvements based on assessments and associated corrective actions required under the RTCR. The additional federal requirements are not anticipated to significantly increase overall costs to the public.

PN

- The impact of the proposed rulemaking upon the public is anticipated to be minimal. The proposed rulemaking would provide an improved mechanism for PWSs to delivery compliance information to customers and would allow community PWSs to include certain Tier 3 PNs in the PWSs annual CCR. The proposed rulemaking may provide a potential cost savings to the public and is not anticipated to significantly increase overall costs to the public.

LCR

- The impact of the proposed rulemaking upon the public is anticipated to be minimal. The proposed rulemaking will require PWSs to collect additional tap samples for applicable WQPs and would provide PWSs improved data to assist them in further assessing the corrosivity of their water within their distribution system. The additional federal requirements are not anticipated to significantly

increase overall costs to the public. The proposed rulemaking will require PWSs to sample for WQPs more frequently and will require PWSs to sample for additional WQPs which are based on EPA's March 2016 *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems* guidance document to assist them in further assessing the corrosivity of the water within their distribution system. The additional state requirements are not anticipated to significantly increase overall costs to the public.

BWN

- The impact of the proposed rulemaking upon the public is anticipated to be minimal. The proposed rulemaking would provide clear and consistent notification to the public when PWSs are under a BWN. The proposed rulemaking is not anticipated to significantly increase overall costs to the public.

DLQOR

- The impact of the proposed rulemaking upon the public is anticipated to be minimal. The proposed rulemaking would allow the public to be more informed about the quality of their drinking water. The proposed rulemaking is not anticipated to significantly increase overall costs to the public.

C.) Agency programs:

RTCR

- The impact of the proposed rulemaking would require the Office of Water (OW) to revise the text of its public education materials as well as its correspondence provided to PWSs that commit violations or are subject to compliance requirements associated with the RTCR. The OW would be required to modify and enhance its compliance programs to implement the RTCR provisions. The Office of Compliance and Enforcement (OCE) would be affected by the requirement for inspections, data entry, and correspondence to the regulated community. The OCE will conduct enhanced investigations of community distribution systems on a discretionary basis with a target of once every five years in addition to the currently required Comprehensive Compliance Investigations conducted at PWSs once every three years. An enhanced evaluation of the distribution system would include, but not be limited to, a review of the RTCR, nitrification, and lead/copper monitoring plans, as well as a review of the sample analysis and sampling locations, monthly operating reports, and other supporting compliance documents. Investigations will be conducted based on findings of previous investigations, compliance with distribution requirements, sampling results, complaints, and regional staff knowledge. It is anticipated that OCE's Enforcement Division will receive information requests about the proposed amendments as well as a minimal increase in enforcement caseloads. As referenced in the RTCR Plus rule project fiscal note, at this time the agency does not have sufficient staff resources to implement the proposed rules. The agency may request additional funding in the next legislative session or reallocate resources to fund the proposed changes. Fourteen full-time equivalent employees will be required.

GWR

- The impact of the proposed rulemaking would affect OCE due to EPA's additional emphasis on the identification of significant deficiencies in PWSs distribution system. This impact is anticipated to be minimal, but would require additional compliance monitoring activities by OCE regarding corrective action schedules and would result in a minimal increase in OCE's enforcement caseloads. The impact of the proposed rulemaking would require the OW to conduct additional compliance monitoring activities associated with the GWR raw source sampling requirements; however, any impact is anticipated to be minimal.

LCR

- The impact of the proposed rulemaking would require the OW to conduct additional compliance monitoring activities associated with the LCR WQPs sampling requirements; however, any impact is anticipated to be minimal. The proposed rulemaking would require the OW to conduct additional compliance monitoring activities associated with the LCR WQPs sampling requirements; however, any impact is anticipated to be minimal.

DLQOR

- The impact of the proposed rulemaking would require the OW to conduct additional compliance monitoring activities associated with PNs; however, any impact is anticipated to be minimal.

Stakeholder meetings:
The OW has provided training and outreach efforts for stakeholders concerning the RTCR requirements at 14 events including the 2014 and 2015 Public Drinking Water Conference, 2015 and 2016 RTCR PWS Training Workshops, and the 2013 - 2016 Drinking Water Advisory Work Group meetings. The OW in partnership with the Texas Section American Water Works Association, Texas Rural Water Association, Texas Water Utilities Association, and Red River Authority of Texas has provided RTCR training and outreach efforts to stakeholders during 2015 - 2016 sponsored events. The OW also provided RTCR training and outreach efforts to stakeholders during the 2016 TCEQ Environmental Trade Fair and Conference. In addition, the OW is scheduled to provide future RTCR training and outreach efforts to stakeholders during the RTCR rulemaking and implementation process.

As a result of these training events, the OW has received generally positive feedback from stakeholders concerning the RTCR and other federal and state provisions. The OW has gained valuable insight and recommendations concerning methods and processes to streamline and provide consistency with the implementation of the RTCR and other federal and state provisions. The OW has developed program documents to assist PWSs in obtaining compliance with the RTCR requirements and has made revisions to these documents based on stakeholder input and recommendations.

Potential controversial concerns and legislative interest:

RTCR

- The RTCR adds corrective action and treatment technique requirements for PWSs, requiring PWSs or a third party approved by the executive director to conduct assessments in response to coliform monitoring triggers. These assessments are anticipated to involve additional costs as well as time commitments by PWSs. The reasonableness of RTCR's required state-approved startup procedure for PWSs that operate on a seasonal basis could be controversial regarding what is considered reasonable; however, the proposed revisions meet the federal primacy requirements.
- The executive director does not intend to include the RTCR's option for allowing PWSs serving 1,000 or fewer people to conduct reduced coliform monitoring on a quarterly or annual basis. This determination is based on the statutory provision under the THSC, §341.033(d) which requires PWSs that furnish drinking water to less than 25,000 persons to submit to the commission, during each monthly period of the PWSs operation, at least one specimen of water taken from the PWS for bacteriological analysis. This requirement will continue to be implemented in Texas and PWSs serving 1,000 or fewer people may want to seek a reduced microbial sampling schedule.

BWN

- The proposed rulemaking may require PWSs to issue BWNs to customers at the discretion of the executive director in addition to pre-existing requirements. PWSs will be required to provide boil water rescind notices to customers.

Special Precautions, Protective Measures, and BWNs

- The proposed rulemaking will allow the executive director to initiate a special investigation after a PWS fails to submit surface water treatment or groundwater under the influence of surface water treatment compliance data to the commission and will require the PWS to issue a BWN to customers under these specific conditions.

Will this rulemaking affect any current policies or require development of new policies?

The impact of the proposed rulemaking will require the OW to modify and enhance compliance programs and policies to implement the RTCR provisions and staff recommendations. The OCE will be required to revise their inspection procedures, data entry, correspondence, and enforcement policies to implement the RTCR provisions and staff recommendations.

What are the consequences if this rulemaking does not go forward? Are there alternatives to rulemaking?

The EPA could directly implement the RTCR and GWR provisions. This option will prevent the agency from obtaining primary enforcement authority for these rules which could also impact federal funding for administering the state drinking water program.

Re: Docket No. 2015-1532-RUL

Key points in the proposal rulemaking schedule:

Anticipated proposal date: September 21, 2016
Anticipated *Texas Register* publication date: October 7, 2016
Anticipated public hearing date: November 1, 2016
Anticipated public comment period: October 7 - November 7, 2016
Anticipated adoption date: March 8, 2017

Agency contacts:
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Ruth Takeda, Staff Attorney, (512) 239-6635
Sherry Davis, Texas Register Coordinator, (512) 239-2141

Attachments
Federal Register, EPA 40 CFR Parts 141 and 142 - Volume 78 No. 30, National Primary Drinking Water Regulations: Revisions to the Total Coliform Rule (pages 10270 – 10365)

Federal Register, EPA 40 CFR Parts 141 and 142 - Volume 79 No. 38, National Primary Drinking Water Regulations: Minor Corrections to the Revisions to the Total Coliform Rule (pages 10665 – 10670)

Federal Register, EPA 40 CFR Parts 141 and 142 - Volume 79 No. 38, National Primary Drinking Water Regulations: Minor Corrections to the Revisions to the Total Coliform Rule (pages 10752 – 10754)

cc: Chief Clerk, 2 copies
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FEDERAL REGISTER

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Part II

Environmental Protection Agency

40 CFR Parts 141 and 142

National Primary Drinking Water Regulations: Revisions to the Total Coliform Rule; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 141 and 142

[EPA–HQ–OW–2008–0878; FRL–9684–8]

RIN 2040–AD94

National Primary Drinking Water Regulations: Revisions to the Total Coliform Rule

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA or the Agency) is finalizing revisions to the 1989 Total Coliform Rule (TCR). The Revised Total Coliform Rule (RTCR) offers a meaningful opportunity for greater public health protection beyond the 1989 TCR. Under the RTCR there is no longer a monthly maximum contaminant level (MCL) violation for multiple total coliform detections. Instead, the revisions require systems that have an indication of coliform contamination in the distribution system to assess the problem and take corrective action that may reduce cases of illnesses and deaths due to potential fecal contamination and waterborne pathogen exposure. This final rule also updates provisions in other rules that reference analytical methods and other requirements in the 1989 TCR (e.g., Public Notification and Ground Water Rules). These revisions are in accordance with the 1996 Safe Drinking Water Act (SDWA) Amendments, which require EPA to review and revise, as appropriate, each national primary drinking water regulation no less often than every six years. These revisions also conform with the SDWA provision that requires any revision to ''maintain, or provide for greater, protection of the health of persons.'' As with the 1989 TCR, the RTCR applies to all public water systems.

DATES: This final rule is effective on April 15, 2013. For judicial purposes, this final rule is promulgated as of February 13, 2013. The compliance date for the rule requirements is April 1, 2016. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register (FR) as of April 15, 2013.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA–HQ–OW–2008–0878. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, e.g., Confidential Business Information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *http://www.regulations.gov* or in hard copy at the Water Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Water Docket is (202) 566–2426.

FOR FURTHER INFORMATION CONTACT: Sean Conley, Standards and Risk Management Division, Office of Ground Water and Drinking Water (MC–4607M), Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460; telephone number: (202) 564–1781; email address: *conley.sean@epa.gov.* For general information, contact the Safe Drinking Water Hotline, telephone number: (800) 426–4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding legal holidays, from 10 a.m. to 4 p.m. Eastern time.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Regulated Categories and Entities

Entities potentially regulated by the RTCR are all public water systems (PWSs). Regulated categories and entities include the following:

Category	Examples of regulated entities
Industry	Privately-owned community water systems (CWSs), transient non-community water systems (TNCWSs), and non-transient non-community water systems (NTNCWSs).
Federal, State, Tribal, and local governments	Publicly-owned CWSs, TNCWSs, and NTNCWSs.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the definition of ''public water system'' in § 141.2 and the section entitled ''Coverage'' in § 141.3 in title 40 of the Code of Federal Regulations (CFR), and the applicability criteria in § 141.851(b) of this rule. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

B. Copies of This Document and Other Related Information

This document is available for download at [INSERT WEBSITE ADDRESS]. For other related information, see preceding discussion on docket. EPA also prepared a *Response to Comments Document* that addresses the comments received during the comment period (to access this document, search for Docket ID No. EPA–HQ–OW–2008–0878 in *www.regulations.gov*).

C. Executive Summary

EPA is finalizing the Revised Total Coliform Rule (RTCR). The RTCR maintains the purpose of the 1989 Total Coliform Rule (TCR) to protect public health by ensuring the integrity of the drinking water distribution system and monitoring for the presence of microbial contamination. EPA anticipates greater public health protection under the RTCR, as it requires public water systems (PWSs) that are vulnerable to microbial contamination to identify and fix problems, and it establishes criteria for systems to qualify for and stay on reduced monitoring, thereby providing incentives for improved water system operation.

The RTCR, as with the 1989 TCR, is the only microbial drinking water regulation that applies to all PWSs. Systems are required to meet a legal limit (i.e., maximum contaminant level (MCL)) for *E. coli,* as demonstrated by required monitoring. The RTCR specifies the frequency and timing of the microbial testing by water systems based on population served, system type, and source water type. The rule also requires public notification when

there is a potential health threat as indicated by monitoring results, and when the system fails to identify and fix problems as required.

The entities potentially affected by the RTCR are PWSs that are classified as community water systems (CWSs) (e.g., systems that provide water to year-round residents in places like homes or apartment buildings) or non-community water systems (NCWSs) (e.g., systems that provide water to people in locations such as schools, office buildings, restaurants, etc.); State primacy agencies; and local and tribal governments. The RTCR applies to approximately 155,000 PWSs that serve approximately 310 million (M) individuals.

The RTCR establishes a health goal (maximum contaminant level goal, or MCLG) and an MCL for *E. coli,* a more specific indicator of fecal contamination and potential harmful pathogens than total coliforms. EPA replaces the MCLG and MCL for total coliforms with a treatment technique for coliforms that requires assessment and corrective action. Many of the organisms detected by total coliform methods are not of fecal origin and do not have any direct public health implication.

Under the treatment technique for coliforms, total coliforms serve as an indicator of a potential pathway of contamination into the distribution system. A PWS that exceeds a specified frequency of total coliform occurrence must conduct an assessment to determine if any sanitary defects exist (a sanitary defect is defined by the RTCR 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 of a barrier that is already in place''); if any are found, the system must correct them. In addition, under the treatment technique requirements, a PWS that incurs an *E. coli* MCL violation must conduct an assessment and correct any sanitary defects found.

The RTCR links monitoring frequency to compliance monitoring results and system performance. It provides criteria that well-operated small systems must meet to qualify for and stay on reduced monitoring. It requires increased monitoring for high-risk small systems with unacceptable compliance history. It also requires some new monitoring requirements for seasonal systems (such as state and national parks).

The RTCR eliminates public notification requirements based only on the presence of total coliforms. Total coliforms in the distribution system may indicate a potential pathway for contamination but by themselves do not indicate a health threat. Instead, the RTCR requires public notification when an *E. coli* MCL violation occurs, indicating a potential health threat, or when a PWS fails to conduct the required assessment and corrective action.

EPA believes that the provisions of the RTCR will improve public health protection by requiring assessment and corrective action and providing incentives for improved operation. The estimated net incremental cost of the RTCR is $14 million annually at either a three or seven percent discount rate. This represents total increased costs relative to 1989 TCR provisions. PWSs are estimated to incur approximately 97 percent of the rule's net annualized present value costs at the three percent discount rate. States and other primacy agencies incur the remaining costs.

Abbreviations Used in This Document

AGI—Acute Gastrointestinal Illness
AIDS—Acquired Immune Deficiency Syndrome
AIP—Agreement in Principle
AWWA—American Water Works Association
ATP—Alternate Test Procedure
BAT—Best Available Technology
C—Celsius
CCR—Consumer Confidence Report
CDC—Centers for Disease Control and Prevention
CFR—*Code of Federal Regulations*
COI—Cost of Illness
CWS—Community Water System
DBP—Disinfection Byproduct
DWC—Drinking Water Committee
EA—Economic Analysis
EC-MUG—EC Medium with MUG
EPA—United States Environmental Protection Agency
ERS—Economic Research Service
ETV—Environmental Technology Verification
FR—*Federal Register*
GWR—Ground Water Rule
GWUDI—Ground Water Under the Direct Influence of Surface Water
HRRCA—Health Risk Reduction and Cost Analysis
HUS—Hemolytic Uremic Syndrome
ICR—Information Collection Request
IESWTR—Interim Enhanced Surface Water Treatment Rule
M—Million
MCL—Maximum Contaminant Level
MCLG—Maximum Contaminant Level Goal
mg/L—Milligrams per Liter
ml—Milliliters
MRDL—Maximum Residual Disinfectant Level
MUG—4-methylumbelliferyl-Beta-D-glucuronide
NCWS—Non-community Water System
NDWAC—National Drinking Water Advisory Council
NPDWR—National Primary Drinking Water Regulation
NTNCWS—Non-Transient Non-Community Water System
NTU—Nephelometric Turbidity Unit
OMB—Office of Management and Budget
O&M—Operation and Maintenance
PN—Public Notification
PWS—Public Water System
RFA—Regulatory Flexibility Act
RTCR—Revised Total Coliform Rule
SAB—Science Advisory Board
SBA—Small Business Administration
SDWA—Safe Drinking Water Act
SDWIS—Safe Drinking Water Information System
SDWIS/FED—Safe Drinking Water Information System Federal Version
SOP—Standard Operating Procedure
Stage 1 DBPR—Stage 1 Disinfectants and Disinfection Byproducts Rule
Stage 2 DBPR—Stage 2 Disinfectants and Disinfection Byproducts Rule
SWTR—Surface Water Treatment Rule
TCR—Total Coliform Rule
TCRDSAC—Total Coliform Rule/Distribution System Advisory Committee
TMF—Technical, Managerial, and Financial
TNCWS—Transient Non-Community Water System
TWG—Technical Work Group
T&C—Technology and Cost
US—United States
UV—Ultraviolet

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II. Background

A. Statutory Authority

The Safe Drinking Water Act (SDWA) requires the EPA to review and revise, as appropriate, each existing national primary drinking water regulation (NPDWR) no less often than every six years (SDWA section 1412(b)(9), 42 U.S.C. 300g–1(b)(9)). In 2003, EPA completed its review of the 1989 TCR (USEPA 1989a, 54 FR 27544, June 29, 1989) and 68 NPDWRs for chemicals that were promulgated prior to 1997 (USEPA 2003, 68 FR 42908, July 18, 2003). The purpose of the review was to identify new health risk assessments, changes in technology, and other factors that would provide a health-related or technological basis to support a regulatory revision that would maintain or improve public health protection. In the Six-Year Review 1 determination published in July 2003 (USEPA 2003, 68 FR 42908, July 18, 2003), EPA stated its intent to revise the 1989 TCR.

B. Purpose of the Rule

EPA promulgated the 1989 TCR to decrease the risk of waterborne illness. Among all SDWA rules promulgated for preventing waterborne illness, only the TCR applies to all PWSs, making the rule an essential component of the multi-barrier approach in public health protection against endemic and epidemic disease. In combination with the other SDWA rules (e.g., the Ground Water Rule (GWR) (USEPA 2006c, 71 FR 65574, November 8, 2006) and the suite of surface water treatment rules (USEPA 1989b; USEPA 1998b; USEPA 2002; USEPA 2006d)), the RTCR will better address the 1989 TCR objectives and enhance the multi-barrier approach to protecting public health, especially with respect to small ground water PWSs.

In recent years, the number of violations under the 1989 TCR have remained relatively steady, as shown and discussed in Exhibit 4.11 and Appendix G of the *Economic Analysis for the Final Revised Total Coliform Rule* (RTCR EA) (USEPA 2012a). EPA believes that this is reflective of a steady state among PWSs complying with the 1989 TCR and any improvements likely to occur under that rule have largely been achieved. In outlining recommendations for further reductions in occurrence, EPA and the Total Coliform Rule Distribution System Advisory Committee (TCRDSAC) developed an Agreement in Principle (AIP) (USEPA 2008c), which became the basis of the proposed and final RTCR. See section II.C.1 of this preamble, *Total Coliform Distribution System Advisory Committee (TCRDSAC),* for more information about the TCRDSAC and the AIP.

The RTCR aims for greater public health protection than the 1989 TCR in a cost-effective manner by: (1) Maintaining the objectives of the 1989 TCR (i.e., to evaluate the effectiveness of treatment, to determine the integrity of the distribution system, and to signal the possible presence of fecal contamination); (2) reducing the potential pathways of contamination into the distribution system (see section II.D of this preamble, *Public Health Concerns Addressed by the Revised Total Coliform Rule*); (3) using the optimal indicator for the intended objectives (i.e., using total coliforms as an indicator of system operation and

condition rather than an immediate public health concern and using *E. coli* as a fecal indicator (see sections II.D, *Public Health Concerns Addressed by the Revised Total Coliform Rule,* and III.B, *Rule Construct: MCLG and MCL for E. coli and Coliform Treatment Technique,* of this preamble)); (4) requiring more stringent standards than those of the 1989 TCR for systems to qualify for reduced monitoring (see sections III.C.1.b.iii, *Reduced monitoring,* and III.C.1.c.iii, *Reduced monitoring,* of this preamble); and (5) requiring systems that may be vulnerable to contamination, as indicated by their monitoring results and by the nature of their operation (e.g., seasonal systems), to monitor more frequently and have in place procedures that will minimize the incidence of contamination (e.g., requiring start-up procedures for seasonal systems) (see sections III.C.1.b.iv, *Increased monitoring,* III.C.1.c.iv, *Requirements for returning to monthly monitoring,* and III.C.1.f, *Seasonal systems,* of this preamble). EPA, therefore, anticipates greater public health protection under the RTCR compared to the 1989 TCR because of the RTCR's more preventive approach to identifying and fixing problems that affect or may affect public health.

C. Rule Development

1. Total Coliform Rule Distribution System Advisory Committee (TCRDSAC)

The revisions to the 1989 TCR are primarily based on the recommendations of the Total Coliform Rule Distribution System Advisory Committee (''TCRDSAC'' or the ''advisory committee''). EPA established the TCRDSAC in June 2007 in accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App.2, 9(c), to provide recommendations to EPA on revisions to the 1989 TCR and on what information about distribution system issues is needed to better understand and address possible public health impacts from potential degradation of drinking water quality in distribution systems (USEPA 2007a, 72 FR 35869, June 29, 2007).

All advisory committee members agreed to a set of recommendations and signed a final Agreement in Principle (AIP) in September 2008. Pursuant to the AIP, EPA on July 14, 2010 proposed revisions to the 1989 TCR (USEPA 2010a, 75 FR 40926, July 14, 2010) that, to the maximum extent consistent with EPA's legal obligations, had the same substance and effect as the elements of the AIP. The AIP and details about the advisory committee can be found at EPA's Web site at *http://water.epa.gov/lawsregs/rulesregs/sdwa/tcr/regulation_revisions_tcrdsac.cfm.*

2. Stakeholder Involvement

In accordance with one of the recommendations of the TCRDSAC, EPA held two annual stakeholder meetings, prior to publishing the proposed revisions, to which all advisory committee members and the public at large were invited. In April 2009 and May 2010, EPA held these stakeholder meetings to provide updates and an opportunity for stakeholders to provide feedback on the development of a proposed RTCR that had the same substance and effect as the recommendations in the AIP.

EPA proposed the RTCR on July 14, 2010 (USEPA 2010a, 75 FR 40926, July 14, 2010) and requested public comment. EPA received approximately 150 comment letters on the proposal and considered the comments in making revisions to the final RTCR. Key issues raised by the commenters are discussed in their corresponding sections of this preamble. A *Response to Comments Document* is available in the docket of the RTCR (search for Docket ID No. EPA–HQ–OW–2008–0878 in *www.regulations.gov*).

During the public comment period for the proposed RTCR, EPA also held several meetings to solicit and provide the public with information about the provisions of the proposed rule. In addition to consulting with the advisory committee and holding stakeholder meetings, EPA consulted with specific stakeholders such as the National Drinking Water Advisory Council (NDWAC), the Science Advisory Board (SAB), and Tribal representatives, among others. These consultations are discussed in section VII of this preamble, *Statutory and Executive Order Review.*

D. Public Health Concerns Addressed by the Revised Total Coliform Rule

1. Public Health Concerns, Fecal Contamination, and Waterborne Pathogens

The RTCR aims to increase public health protection through the reduction of potential pathways of entry for fecal contamination into the distribution system. Since these potential pathways represent vulnerabilities in the distribution system whereby fecal contamination and/or waterborne pathogens, including bacteria, viruses and parasitic protozoa could possibly enter the system, the reduction of these pathways in general should lead to reduced exposure and associated risk from these contaminants. Fecal contamination and waterborne pathogens can cause a variety of illnesses, including acute gastrointestinal illness (AGI) with diarrhea, abdominal discomfort, nausea, vomiting, and other symptoms. Most AGI cases are of short duration and result in mild illness. Other more severe illnesses caused by waterborne pathogens include hemolytic uremic syndrome (HUS) (kidney failure), hepatitis, and bloody diarrhea (WHO 2004). Chronic disease such as irritable bowel syndrome, renal impairment, hypertension, cardiovascular disease and reactive arthritis can result from infection by a waterborne agent (Clark *et al.* 2008; Clark *et al.* 2010; Moorin *et al.* 2010).

When humans are exposed to and infected by waterborne enteric pathogens, the pathogens become capable of reproducing in the gastrointestinal tract. As a result, healthy humans shed pathogens in their feces for a period ranging from days to weeks. This shedding of pathogens often occurs in the absence of any signs of clinical illness. Regardless of whether a pathogen causes clinical illness in the person who sheds it in his or her feces, the pathogen being shed may infect other people directly by person-to-person spread, contact with contaminated surfaces, and other means referred to as secondary spread. As a result, waterborne pathogens that are initially waterborne may subsequently infect other people through a variety of routes (WHO 2004). Sensitive subpopulations are at greater risk from waterborne disease than the general population (Gerba *et al.* 1996). For a discussion of sensitive subpopulations, see section VII.L of this preamble, *Impacts on Sensitive Subpopulations as Required by Section 1412(b)(3)(c)(i)(V) of the 1996 Amendments of the Safe Drinking Water Act (SDWA).*

2. Indicators

Total coliforms are a group of closely related bacteria that, with a few exceptions, are not harmful to humans. Coliforms are abundant in the feces of warm-blooded animals, but can also be found in aquatic environments, in soil, and on vegetation. Coliform bacteria may be transported to surface water by run-off or to ground water by infiltration. Total coliforms are common in ambient water and may be injured by environmental stresses such as lack of nutrients, and water treatments such as chlorine disinfection, in a manner similar to most bacterial pathogens and

many viral enteric pathogens (including fecal pathogens). EPA considers total coliforms to be a useful indicator that a potential pathway exists through which fecal contamination can enter the distribution system. This is because the absence (versus the presence) of total coliforms in the distribution system indicates a reduced likelihood that fecal contamination and/or waterborne pathogens are occurring in the distribution system.

Under the 1989 TCR, each total coliform-positive sample is assayed for either fecal coliforms or *E. coli.* Fecal coliform bacteria are a subgroup of total coliforms that traditionally have been associated with fecal contamination. Since the promulgation of the 1989 TCR, more information and understanding of the suitability of fecal coliform and *E. coli* as indicators have become available. Study has shown that the fecal coliform assay is imprecise and too often captures bacteria that do not originate in the human or mammal gut (Edberg *et al.* 2000). On the other hand, *E. coli* is a more restricted group of coliform bacteria that almost always originate in the human or animal gut (Edberg *et al.* 2000). Thus, *E. coli* is a better indicator of fecal contamination than fecal coliforms. The provisions of the RTCR reflect the improved understanding of the value of total coliforms and *E. coli* as indicators.

3. Occurrence of Fecal Contamination and Waterborne Pathogens

a. Presence of fecal contamination. Fecal contamination is a very general term that includes all of the organisms found in feces, both pathogenic and nonpathogenic. Fecal contamination can occur in drinking water both through use and inadequate treatment of contaminated source water as well as direct intrusion of fecal contamination into the drinking water distribution system. Lieberman *et al.* (1994) discuss the general association between fecal contamination and waterborne pathogens. Biofilms in distribution systems may harbor waterborne bacterial pathogens and accumulate enteric viruses and parasitic protozoa (Skraber *et al.* 2005; Helmi *et al.* 2008). Waterborne pathogens in biofilms may have entered the distribution system as fecal contamination from humans or animals.

Co-occurrence of indicators and waterborne pathogens is difficult to measure. While the analytical methods approved by EPA to assay for *E. coli* are able to detect indicators of fecal contamination, they do not specifically identify most of the pathogenic *E. coli* strains. There are at least 700 recognized *E. coli* strains (Kaper *et al.* 2004) and about 10 percent of recognized *E. coli* strains are pathogenic to humans (Feng 1995; Hussein 2007; Kaper *et al.* 2004). Pathogenic *E. coli* include *E. coli* O157:H7, which is the primary cause of HUS in the United States (Rangel *et al.* 2005). The US Centers for Disease Control and Prevention (CDC) estimates that there are 73,000 cases of illness each year in the US due to *E. coli* O157:H7 (Mead *et al.* 1999). The CDC estimates that about 15 percent of all reported *E. coli* O157:H7 cases are due to water contamination (Rangel *et al.* 2005). Active surveillance by CDC shows that 6.3 percent of *E. coli* O157:H7 cases progress to HUS (Griffin and Tauxe 1991; Gould *et al.* 2009) and about 12 percent of HUS cases result in death within four years (Garg *et al.* 2003). About 4 to 15 percent of cases are transmitted within households by secondary transmission (Parry and Salmon 1998).

Because EPA-approved standard methods for *E. coli* do not typically identify the presence of the pathogenic *E. coli* strains, an *E. coli*-positive monitoring result is an indicator of fecal contamination but is not necessarily a measure of waterborne pathogen occurrence. Specialized assays and methods are used to identify waterborne pathogens, including pathogenic *E. coli.*

One notable exception is the data reported by Cooley *et al.* (2007), which showed high concentrations of pathogenic *E. coli* strains in samples containing high concentrations of fecal indicator *E. coli.* These data are from streams and other poor quality surface waters surrounding California spinach fields associated with the 2006 *E. coli* O157:H7 foodborne outbreak. Data equivalent to these samples are not available from drinking water samples collected under the 1989 TCR.

Because *E. coli* is an indicator of fecal contamination (Edberg *et al.* 2000), and because of the general association between fecal contamination and waterborne pathogens (Lieberman *et al.* 1994; Lieberman *et al.* 2002), *E. coli* is a meaningful indicator for fecal contamination and the potential presence of associated pathogen occurrence.

b. Waterborne disease outbreaks. The CDC defines a waterborne disease outbreak as occurring when at least two persons experience a similar illness after ingesting a specific drinking water (or after exposure to recreational water) contaminated with pathogens (or chemicals) (Kramer *et al.* 1996), or when one person experiences amoebic meningoencephalitis after similar waterborne exposure. The CDC maintains a database on waterborne disease outbreaks in the United States. The database is based upon responses to a voluntary and confidential survey form that is completed by State and local public health officials.

The National Research Council strongly suggests that the number of identified and reported outbreaks in the CDC database for surface and ground waters represents only a small percentage of the actual number of waterborne disease outbreaks (NRC 1997; Bennett *et al.* 1987; Hopkins *et al.* 1985 for Colorado data). Under-reporting occurs because most waterborne outbreaks in community water systems are not recognized until a sizable proportion of the population is ill (Perz *et al.* 1998; Craun 1996), perhaps 1 percent to 2 percent of the population (Craun 1996). EPA drinking water regulations are designed to protect against endemic waterborne disease and to minimize waterborne outbreaks. In contrast to outbreaks, endemic disease refers to the persistent low to moderate level or the usual ongoing occurrence of illness in a given population or geographic area (Craun *et al.* 2006).

III. Requirements of the Revised Total Coliform Rule

The RTCR maintains and strengthens the objectives of the 1989 TCR and is consistent with the recommendations in the AIP. The objectives are: (1) To evaluate the effectiveness of treatment, (2) to determine the integrity of the distribution system, and (3) to signal the possible presence of fecal contamination. The RTCR better addresses these objectives by requiring systems that may be vulnerable to fecal contamination (as indicated by their monitoring results) to do an assessment, to identify whether any sanitary defect(s) is (are) present, and to correct the defects. Therefore, the Agency anticipates greater public health protection under the RTCR compared to the 1989 TCR because of its more preventive approach to identifying and fixing problems that affect or may affect public health. The following is an overview of the key provisions of the RTCR:

• *MCLG and MCL for E. coli and coliform treatment technique for protection against potential fecal contamination.* The RTCR establishes a maximum contaminant level goal (MCLG) and maximum contaminant level (MCL) for *E. coli.* Under the RTCR there is no longer a monthly maximum contaminant level (MCL) violation for multiple total coliform detections. The RTCR takes a preventive approach to protecting public health by establishing

a coliform treatment technique for protection against potential fecal contamination. The treatment technique uses both total coliforms and *E. coli* monitoring results to start an evaluation process that, where necessary, requires the PWS to conduct follow-up corrective action that could prevent future incidences of contamination and exposure to fecal contamination and/or waterborne pathogens. See section III.B of this preamble, *Rule Construct: MCLG and MCL for E. coli and Coliform Treatment Technique,* for further discussion on the MCLG, MCL, and treatment technique requirements.

• *Monitoring.* As with the 1989 TCR, PWSs will continue to monitor for total coliforms and *E. coli* according to a sample siting plan and schedule specific to the system.

Sample siting plans under the RTCR must continue to be representative of the water throughout the distribution system. Under the RTCR, systems have the flexibility to propose repeat sample locations that best verify and determine the extent of potential contamination of the distribution system rather than having to sample within five connections upstream and downstream of the total coliform-positive sample location. In lieu of proposing new repeat sample locations, the systems may stay with the default used under the 1989 TCR of within-five-connections-upstream-and-downstream of the total coliform-positive sample location.

As with the 1989 TCR, the RTCR allows reduced monitoring for some small ground water systems. The RTCR is expected to improve public health protection compared to the 1989 TCR by requiring small ground water systems that are on or wish to conduct reduced monitoring to meet certain eligibility criteria. Examples of the criteria include a sanitary survey showing that the system is free of sanitary defects, a clean compliance history for 12 months, and a recurring annual site visit by the State and/or a voluntary Level 2 assessment for systems on annual monitoring.

For small ground water systems, the RTCR requires increased monitoring for high-risk systems such as those that do not have a clean compliance history under the RTCR. The RTCR specifies conditions under which systems will no longer be eligible for reduced monitoring and be required to return to routine monitoring or to monitor at an increased frequency.

The RTCR requires systems on a quarterly or annual monitoring frequency (applicable only to ground water systems serving 1,000 or fewer people) to collect at least three additional routine monitoring samples the month following one or more total coliform-positive samples, unless the State waives the additional routine monitoring. This is a reduction in the required number of additional routine samples from the 1989 TCR, which requires at least five routine samples in the month following a total coliform-positive sample for all systems serving 4,100 or fewer people.

The 1989 TCR requires all systems serving 1,000 or fewer people to collect at least four repeat samples while requiring PWSs serving 1,000 people or greater to collect three repeat samples. The RTCR requires three repeat samples after a routine total coliform-positive sample, regardless of the system type and size.

See sections III.C, *Monitoring,* and III.D, *Repeat Samples,* of this preamble for detailed discussions of the routine monitoring and repeat sampling requirements of the RTCR.

• *Seasonal systems.* For the first time, the RTCR establishes monitoring requirements specific to seasonal systems. Seasonal systems represent a special case in that the shutdown and start-up of these water systems present additional opportunities for contamination to enter or spread through the distribution system. Under the RTCR, seasonal systems must demonstrate completion of a State-approved start-up procedure. See sections III.A.4, *Seasonal systems,* and III.C.1.f, *Seasonal systems,* of this preamble for further discussion of requirements for seasonal systems.

• *Assessment and corrective action.* As part of a treatment technique, all PWSs are required to assess their systems when monitoring results show that the system may be vulnerable to contamination. Systems must conduct either a Level 1 assessment or a more detailed Level 2 assessment depending on the level of concern raised by the results of indicator sampling. The system is responsible for correcting any sanitary defect(s) found through either a Level 1 or Level 2 assessment. See section III.E of this preamble, *Coliform Treatment Technique,* for more discussion of the treatment technique requirement of the RTCR.

• *Violations and public notification.* The RTCR establishes an *E. coli* MCL violation, a treatment technique violation, a monitoring violation, and a reporting violation. Public notification is required for each type of violation, with the type of notification dependent on the degree of potential public health concern. This is consistent with EPA's current public notification requirements under 40 CFR part 141 subpart Q. The RTCR also modifies the public notification and Consumer Confidence Report language to reflect the construct of the rule. See sections III.F, *Violations,* and III.G, *Providing Notification and Information to the Public,* of this preamble for further discussions of violations and public notification under the RTCR.

• *Transition to the RTCR.* The RTCR allows all systems to transition to the new rule at their 1989 TCR monitoring frequency, including systems on reduced monitoring under the 1989 TCR. For ground water systems serving 1,000 or fewer people, States must conduct a special monitoring evaluation during each sanitary survey after the compliance effective date of the RTCR. Initial grandfathering of monitoring frequencies reduces State burden by not requiring the State to determine appropriate monitoring frequency at the same time the State is working to adopt primacy, develop policies, and train their own staff and the PWSs in the State.

The provisions of the RTCR are contained in the new 40 CFR part 141 subpart Y, superseding 40 CFR 141.21 beginning April 1, 2016.

A. RTCR Definitions

1. Assessment

a. Provisions. EPA is defining a Level 1 assessment and a Level 2 assessment to help in the implementation of the RTCR and to better differentiate between the two levels of assessments.

A Level 1 assessment is an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. It is conducted by the system operator or owner (or his designated representative). Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a ground water system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The system must conduct the assessment consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and

characteristics of the distribution system.

A Level 2 assessment is an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. A Level 2 assessment provides a more detailed examination of the system (including the system's monitoring and operational practices) than does a Level 1 assessment through the use of more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. It is conducted by an individual approved by the State, which may include the system operator. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a ground water system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The system must conduct the assessment consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system. The system must comply with any expedited actions or additional actions required by the State in the case of an *E. coli* MCL violation.

b. Key issues raised. EPA did not propose definitions for Level 1 and Level 2 assessments. However, based on the comments EPA received, there was concern that the distinction between the two levels of assessment is not sufficiently laid out in the rule language. This might pose some problems in the implementation of the RTCR. In response, EPA is defining a Level 1 assessment and a Level 2 assessment. This issue and the RTCR requirements regarding assessments are discussed further in section III.E.2 of this preamble, *Assessment.*

2. Clean Compliance History

a. Provisions. In the final RTCR, EPA is defining ''clean compliance history'' as a record of no maximum contaminant level (MCL) violations under 40 CFR 141.63; no monitoring violations under 40 CFR 141.21 or subpart Y; and no coliform treatment technique trigger exceedances or coliform treatment technique violations under subpart Y. This is the same definition that the advisory committee recommended in the AIP and that EPA proposed in July 2010 (USEPA 2010a, 75 FR 40926, July 14, 2010). The term is specific to RTCR compliance and is used to determine eligibility of systems for reduced monitoring. It does not include violations under other existing NPDWRs. Systems must have a ''clean compliance history'' for a minimum of 12 months to qualify for reduced monitoring (see sections III.C.1.b.iii, *Reduced monitoring,* and III.C.1.c.iii, *Reduced monitoring,* of this preamble regarding reduced monitoring).

However, while the definition of ''clean compliance history'' includes only 1989 TCR/RTCR violations, the State may (and should) consider compliance history under other rules if relevant. For example, failure to take a triggered source water sample required under the GWR (USEPA 2006, 71 FR 65574, November 8, 2006) may appropriately cause the State to not allow less frequent monitoring because this could (1) lead the system to miss source water contamination and (2) indicate a system's lack of attention to regulatory requirements or proper operation.

b. Key issues raised. EPA received comments that a record of no monitoring violations should not be included in the definition of ''clean compliance history.'' Commenters are concerned that small systems, which experience frequent turnover or shortage of staff, may not be able to qualify for reduced monitoring if they miss a sample or two. EPA believes that a system on a reduced monitoring frequency (i.e., less than monthly, either quarterly or annually) must be able to demonstrate that it is capable of delivering safe water and maintaining proper attention to the water system, even on an infrequent monitoring schedule, by meeting certain criteria (see sections III.C.1.b.iii, *Reduced monitoring,* and III.C.1.c.iii, *Reduced monitoring,* of this preamble for discussion about the reduced monitoring criteria). Small systems monitoring less frequently than monthly, especially those monitoring only annually, already have a lower probability of detecting a contamination event compared to systems that monitor monthly. Because of the intermittent nature of contamination and the fact that these systems are already on a significantly reduced monitoring frequency, it is very important that these systems take their samples as required. Because these systems monitor so infrequently, EPA recommends that the States use the annual site visits as an opportunity to review system operations, reinforce the importance of collecting the required samples, and to identify and require correction of any sanitary defects. The State can make sure that the system takes its required sample, and therefore avoids incurring a monitoring violation because of a missed sample (see section III.C.1.b.iii of this preamble, *Reduced monitoring,* for discussion of annual monitoring). EPA is therefore retaining the definition of ''clean compliance history'' as proposed because EPA believes that removing the record of no monitoring violation from the definition would be less protective of public health. However, EPA is providing flexibility to the States in considering monitoring violations in TNCWSs when determining whether the system must go on increased monthly monitoring. See sections III.C.1.b, *Ground water NCWSs serving ≤ 1,000 people,* and III.C.2.b, *Ground water NCWSs serving ≤ 1,000 people,* of this preamble for a more detailed discussion.

3. Sanitary Defect

a. Provisions. EPA is finalizing the definition of sanitary defect as proposed in July 2010 (USEPA 2010a, 75 FR 40926, July 14, 2010). It is 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.'' As stated in the proposed rule, the first part of the definition focuses on the problems in the distribution system that may provide a pathway for contaminants to enter the distribution system and its implication for potential exposure to both microbial and chemical contaminants. The second part of the definition also recognizes the importance of having barriers in place to prevent the entry of microbial contaminants into the distribution system. Indications of failure or imminent failure of these barriers are defects that require corrective action.

The advisory committee deliberated on the definition of sanitary defect and suggested that the definition should be broad enough to facilitate corrective action without absolute confirmation of cause and effect, as such confirmation may be impossible or may significantly delay corrections that would address a sanitary defect that represents a potential threat to public health. Conversely, the language is not intended to suggest that corrections must be undertaken where the linkage between the defect and public health is tenuous. The advisory committee also agreed that

it is their intent that nothing in the definition of sanitary defects precludes conducting an assessment of every element on the example checklists for Level 1 and Level 2 assessments (USEPA 2008d).

b. Key issues raised. EPA received comments regarding the relationship between sanitary defects under the RTCR and ''significant deficiencies' under other regulations and the possible confusion between the two terms. One commenter said that the requirement to identify and correct sanitary defects under the RTCR is very similar to the GWR's requirement to identify and correct significant deficiencies, and that EPA should therefore consider which rule is more effective at minimizing risk of contamination.

The advisory committee specifically stated that ''sanitary defects'' are specific to the assessment and corrective action requirements of the RTCR and are not intended to be linked directly to ''significant deficiencies'' under the Interim Enhanced Surface Water Treatment Rule (IESWTR) (USEPA 1998, 63 FR 69389, December 16, 1998) and the GWR, although some problems could meet either definition. The term ''significant deficiency'' is tied or associated with the eight elements of a sanitary survey. There are problems that are ''sanitary defects'' and are also ''significant deficiencies''. For instance, source water problems like those associated with the well casing may fit the definition of both a ''sanitary defect'' and a ''significant deficiency.'' Depending on when the problem was identified (i.e., during a sanitary survey or during an assessment triggered under RTCR) and on the guidelines set by the State, the system should coordinate with their State regarding how to characterize the problem and how to coordinate the corrective action requirements under the GWR and RTCR, if needed. Conversely, there are problems that are ''sanitary defects'' but are not ''significant deficiencies'' and vice versa. ''Significant deficiency'' can include problems other than those in the distribution system that can have an effect on the long term viability of the system in delivering safe water to its customers. ''Significant deficiencies'' can also exist in the areas of reporting and data verification, system management and operation, and operator compliance with State requirements, which are not considered ''sanitary defects.''

Furthermore, although there might be overlap between a ''sanitary defect'' and ''significant deficiency,'' there are differences in the required timeframes for responding to them (see 40 CFR 141.403(a)(5) and 142.16(b)(1)(ii), and §§ 141.859(b)(3) and (b)(4) of the RTCR). It might therefore be more confusing to use only one term for the requirements of the GWR and RTCR, as suggested by some commenters.

In addition, the GWR only applies to ground water systems. Relying only on the corrective action provisions of the GWR (triggered by a fecal indicator-positive sample) will leave out those systems not covered by the GWR. Also, these GWR provisions are focused on the source water. Since contamination is intermittent and can be from a location other than the source water, the assessment and corrective action provisions in the RTCR will help to better address other types of defects.

As noted in the preamble to the proposed RTCR, nothing in the RTCR is intended to limit the existing authorities of States under other regulations.

4. Seasonal Systems

a. Provisions. EPA is finalizing the definition of seasonal system as ''a non-community water system that is not operated on a year-round basis and starts up and shuts down at the beginning and end of each operating season.''

The advisory committee recognized that seasonal systems have unique characteristics that make them susceptible to contamination. As their name implies, seasonal systems are not operated year-round. The depressurizing and dewatering of the water system, as often occurs with the temporary shutdown of the system, present opportunities for contamination to enter or spread through the distribution system. For example, loss of pressure after a system's shutdown can lead to intrusion of contaminants. Even a system that remains pressurized may be subject to water quality degradation due to stagnant water or loss of disinfectant residual. Microbial growth prior to start-up can result in biofilm formation, which can lead to the accumulation of contaminants. These systems are also more susceptible to contamination due to changes in the conditions of the source water (such as variable contaminant loading due to increased septic tank or septic field use), the seasonal nature of the demand, and the stress that the system experiences. As a result, the Agency is establishing a definition for seasonal systems and setting forth provisions that mitigate the risk associated with the unique characteristics of this type of system (see section III.C.1.f of this preamble, *Seasonal systems,* for requirements for seasonal systems). The advisory committee recommended that such provisions pertain to seasonal systems.

The definition of seasonal system that EPA is promulgating with this final rule is different from the definition proposed in July 2010 (USEPA 2010a, 75 FR 40926, July 14, 2010), which is ''a non-community water system that is operated in three or fewer calendar quarters per calendar year.'' As discussed in the preamble to the proposed rule, EPA was aware of the limitations of the proposed definition that could lead to less public health protection and less effective and more complicated implementation. EPA gave the example of a system that is operated from March to October. Such a system would operate in all four calendar quarters and therefore would not be considered a seasonal system according to the proposed definition, but would nonetheless be subject to the same possibility of distribution system contamination as a seasonal system operated from April to November (i.e., in only three calendar quarters). To address limitations such as this, EPA specifically requested comment on the proposed definition of a seasonal system. The change in the definition from the proposed rule is based on the comments received. Specific requirements (e.g., monitoring, start-up procedure, etc.) for seasonal systems that address the issues associated with such systems are discussed in section III.C.1.f, *Seasonal systems,* and III.C.2.c, *Seasonal systems,* of this preamble.

The definition does not include intermittent systems, such as those that are open year-round but are not operated continuously (e.g., a church open only on Saturdays and Sundays). It also does not include systems that operate year-round but may shut down part of their distribution system for part of the year (e.g., parts of the distribution system that serve a factory that is open only certain times of the year). Since these systems might be subject to the same type of risks as seasonal systems, States may want to consider whether to establish requirements that will mitigate the risks associated with their operation.

b. Key issues raised. EPA received many responses regarding the definition of a seasonal system. Many commenters suggested addressing the issue of depressurization and dewatering in the definition. They suggested that the important risk factor is not the number of quarters the system is in operation but rather the closure and the depressurization and/or dewatering of the distribution system. Other commenters expressed concern about contamination associated with lack of water movement and loss of disinfectant

residual even in a pressurized system. Although the definition of seasonal systems does not directly address these issues, seasonal systems are required to perform start-up procedures (which may include disinfection, flushing, and coliform sampling) prior to serving water to the public. See section III.C.1.f of this preamble, *Seasonal systems,* for a discussion of the requirements for seasonal systems. EPA believes that it is important for a seasonal system to perform start-up procedures to mitigate the public health risks associated with stagnant water and the depressurization and/or dewatering of the distribution system. Hence, failure to perform start-up procedures will result in a treatment technique violation. See section III.F.b of this preamble, *Coliform treatment technique violation,* for additional discussion on this violation.

Since it is possible and perhaps likely that some systems may keep the distribution system pressurized while out of season, EPA has included an additional provision in the RTCR whereby a State can exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating (see §§ 141.854(i)(3), 141.856(a)(4)(ii), and 141.857(a)(4)(ii) of the RTCR). In providing such exemption, the State should conclude that public health protection is maintained. However, a seasonal system monitoring less frequently than monthly must still monitor during the vulnerable period designated by the State. See section III.C.1.f of this preamble, *Seasonal systems,* for additional discussion.

Some commenters suggested that seasonal systems be defined by the number of days, months, or quarters they are not in operation, e.g., 30, 60, or 90 consecutive days, three or more consecutive months, one full calendar quarter, etc. While such a change could address some of EPA's concerns, it does not address the potential for contamination associated with lack of operation and loss of pressure.

B. Rule Construct: MCLG and MCL for E. coli and Coliform Treatment Technique

1. MCLG and MCL

a. Requirements. Under the final RTCR, EPA is eliminating the MCLG for total coliforms (including fecal coliforms) and the MCL for total coliforms. EPA is also establishing an MCLG of zero and an MCL for *E. coli.* The MCL for *E. coli* is based on the monitoring results for total coliforms and *E. coli.* A system is in compliance with the *E. coli* MCL unless any of the following conditions occur:

- A system has an *E. coli*-positive repeat sample following a total coliform-positive routine sample; or
- A routine sample is *E. coli*-positive and one of its associated repeat samples is total coliform-positive; or
- A system fails to test for *E. coli* when any repeat sample tests positive for total coliforms; or
- A system fails to take all required repeat samples following a routine sample that is positive for *E. coli.*

Although not explicitly stated, as a logical consequence of the second condition, a system also violates the MCL when an *E. coli*-positive routine sample is followed by an *E. coli*-positive repeat sample because *E. coli* bacteria are a subset of total coliforms.

EPA is establishing an MCLG of zero for *E. coli* and removing the current MCLG of zero for total coliforms (including fecal coliforms) because *E. coli* is a more specific indicator of fecal contamination and potential harmful pathogens in drinking water than are total coliforms (including fecal coliforms). These requirements were part of the July 2010 proposed rule (USEPA 2010a, 75 FR 40926, July 14, 2010) and are unchanged in the final RTCR. See section III.A.2 of the preamble to the proposed RTCR, *MCLG and MCL for E. coli, and coliform treatment technique,* for further discussion on the MCLG, MCL, and treatment technique requirements.

b. Key issues raised. The majority of the commenters supported EPA's proposal to remove the MCLG and MCL for total coliforms (including fecal coliforms) and to establish an MCLG and MCL for *E. coli.*

However, there were some who commented that removing the MCLG and MCL for total coliforms will result in backsliding in public health protection. These commenters stated that the elimination of the non-acute MCL violation removes a strong incentive for water systems to perform proactive maintenance and operations activities to maintain distribution system water quality and avoid MCL violations and subsequent public notice to customers. EPA disagrees. EPA and the advisory committee decided that removing the MCLG and MCL for total coliforms is appropriate. SDWA section 1412(b)(3)(A)(i) directs EPA to use ''the best available, peer-reviewed science and supporting studies conducted in accordance with sound and objective science practices'' in conducting the risk assessment when promulgating an NPDWR. In 1989, EPA set an MCLG of zero for total coliforms. Since the promulgation of the 1989 TCR, a better understanding of the nature of total coliforms, especially fecal coliforms, has become available. Many of the organisms detected by total coliform and fecal coliform methods are not of fecal origin and do not have any direct public health implications (Edberg *et al.* 2000). Total coliforms may, however, indicate the presence of a pathway by which fecal contamination can occur; thus, total coliforms are instead used as part of a treatment technique requirement, which is discussed in more detail in the next section and in section III.E of this preamble, *Coliform Treatment Technique.* Inclusion of the MCLG and MCL for total coliforms is not supported by the available science and would be contrary to SDWA section 1412(b)(3)(A)(i).

Commenters agreed with EPA's proposal to eliminate the provisions on fecal coliforms. Therefore, fecal coliforms will no longer be used in the RTCR and all analytical methods used to detect for fecal coliforms are also removed from the rule. For a discussion on analytical methods, see section III.I of this preamble, *Analytical Methods.*

2. Coliform Treatment Technique

a. Requirements. EPA is establishing a treatment technique that will require a PWS to conduct an assessment of its system and, when necessary, perform corrective actions in response to trigger conditions that indicate a possible pathway of contamination into the system. The treatment technique requirements are the same as those in the proposed RTCR. A PWS that exceeds a specified frequency of total coliform occurrence must conduct a Level 1 or Level 2 assessment to determine if any sanitary defect exists and, if found, to correct the sanitary defect. As discussed earlier, the MCLG and MCL for total coliforms are removed. The conditions that defined a non-acute MCL violation under the 1989 TCR are now used to trigger a system to conduct an assessment of the system. A discussion of the treatment technique requirements, i.e., the triggers, the levels of assessment, the completion of the assessment form, etc., can be found in section III.E of this preamble, *Coliform Treatment Technique.*

b. Key issues raised. The majority of the commenters supported the change from a total coliform non-acute MCL to a treatment technique requirement. However, some commenters disagreed with the change. They stated that the treatment technique construct will not work for small NCWSs since they typically do not treat their water, have

no certified operator, and have limited or no distribution system. They noted that since systems with limited or no distribution system do not have the extensive network of piping and service connections and other elements that comprise a typical distribution system, the treatment technique construct, which the commenters considered as focusing on the distribution system, will not work. These commenters suggested that for systems with limited or no distribution system, the focus should be on the source, and therefore, the requirements of the GWR should be sufficient. They suggested that the total coliform MCL should be retained for these systems because the treatment technique requirements will be too complicated for these systems to comply with, resulting in more non-compliance, more burden on the State, and likely less public health protection.

EPA disagrees that the treatment technique construct will not work for small NCWSs. The requirement to assess the system after a trigger consists of looking at all of the elements that might have affected the quality of the distributed water, including not only the distribution system but also the source and the treatment process. Although some small systems have limited or no distribution system, they can still have parts of their system (e.g., building plumbing, or buried piping at a campground) that are vulnerable to contamination, such as that introduced by a cross-connection or infiltration. In addition, relying only on the corrective action provisions of the GWR will leave out those systems not covered by the GWR, or in cases of positive results, systems where corrective action under the GWR is not immediately required by the State. For example, total coliform-positive repeat samples do not trigger any action under the GWR, even if those samples are also triggered source water samples. Also, a State may require additional source samples instead of a corrective action after the first fecal indicator positive sample (see 40 CFR 141.402(a)(3)). In addition, some small NCWSs with limited or no distribution system use surface water. Finally, the GWR provisions are focused on the source water. Since contamination is intermittent and can be from a location other than the source water, the assessment and corrective action provisions in the RTCR will help address other types of defects.

EPA understands that there will be implementation challenges during the first few years of the rule implementation, especially for small PWSs. However, as systems with limited or no distribution system are simple systems, the assessments should also be relatively simple. There is nothing in the RTCR that prohibits the States from conducting assessments that integrate the requirements of the GWR and RTCR where appropriate (see section III.E of this preamble, *Coliform Treatment Technique,* for a discussion of the coliform treatment technique). EPA encourages States to make any necessary modifications to their regulations to make the most efficient use of limited State resources and to better integrate these rules for systems with little-to-no distribution system, provided that the revisions satisfy the primacy requirements for both the GWR and the RTCR. Also, EPA plans to develop guidance manuals specifically for small systems to help them comply with the RTCR. EPA is also working to update the Safe Drinking Water Information System (SDWIS) to include the requirements of the RTCR and have SDWIS ready in advance of the compliance date for the rule.

As discussed earlier, EPA believes that the treatment technique requirements are more protective of public health because they require a system to take preventive actions to address problems. This is a change from just issuing a PN and conducting additional monitoring under the 1989 TCR to proactively doing an assessment to determine the cause of the possible contamination under the RTCR and performing corrective action where needed.

C. Monitoring

1. Requirements

a. Requirements that apply to all PWSs. As with the 1989 TCR, the RTCR requires all PWSs to collect and test samples for total coliforms and *E. coli* according to a sample siting plan and schedule specific to the system. PWSs must collect the samples at regular intervals throughout the month, except systems that use only ground water and serve 4,900 or fewer people may collect all required samples on a single day if they are taken from different sites.

Under the RTCR, all PWSs are still required to take repeat samples within 24 hours of learning of any routine monitoring sample that is total coliform-positive. PWSs must comply with the repeat monitoring requirements and *E. coli* analytical requirement, discussed in detail in section III.D of this preamble, *Repeat Samples.* All samples taken for RTCR compliance (routine and repeat) may occur at a customer's premises, dedicated sampling station, or other designated compliance sampling location.

EPA notes that a system must still take the required minimum number of samples even if it has had an *E. coli* MCL violation or has exceeded the coliform treatment triggers before the end of the monitoring compliance period. For example, if a system has an *E. coli* MCL violation after taking 10 of the 40 required routine monthly samples, the system must continue routine total coliform monitoring, analyze any total coliform-positive samples for *E. coli,* and take one round of repeat samples following any total coliform-positive routine sample.

Under the RTCR, systems' sample siting plans must include routine and repeat sample sites and any sampling points necessary to meet the Ground Water Rule (GWR) requirements. As with the 1989 TCR, the sample siting plan is subject to State review and revision.

The repeat sample sites may be alternative monitoring locations that the PWS is proposing to use instead of the repeat sample locations that are within five connections upstream and downstream of the original sampling location that tested total coliform-positive. The PWS must demonstrate to the State's satisfaction that the alternative monitoring locations are representative of a pathway for contamination into the distribution system (for example, near a storage tank), and that the sample siting plan remains representative of the water quality in the distribution system. Systems may elect to specify either alternative fixed locations or criteria for selecting their repeat sampling locations on a situational basis in a standard operating procedure (SOP), which is part of the sample siting plan. The State may determine that monitoring at the entry point to the distribution system (especially for undisinfected ground water systems) is effective to differentiate between potential source water and distribution problems. The use of alternative monitoring locations or an SOP does not require prior State approval but systems are required to submit to their primacy agencies their proposed alternative locations. States can modify and revise these locations or the SOP as needed. Additional discussion about the alternative monitoring locations can be found in section III.D of this preamble, *Repeat Samples.*

Monitoring locations that serve both as a repeat sampling location and a triggered source water monitoring location for the GWR (i.e., locations for dual purpose sampling) must also be included in the sample siting plan. These locations need to be approved by

the State before the PWS can use them. For more discussion on the dual purpose sampling, see section III.D of this preamble, *Repeat Samples.*

Under the RTCR, PWSs may take more than the minimum required number of routine samples and must include the results in calculating whether the total coliform treatment technique trigger for conducting an assessment has been exceeded, but only if the samples are taken in accordance with the sample siting plan and are representative of water throughout the distribution system (see section III.E of this preamble, *Coliform Treatment Technique,* for a discussion on the coliform treatment technique requirements).

Under the RTCR, EPA is not making substantive changes to the requirements of the TCR for (1) special purpose samples, and (2) invalidation of total coliform samples.

New systems that begin operation on or after the compliance date of the RTCR must comply with the routine monitoring frequency established by the RTCR for their system size and type beginning in their first month of operation.

The following are the monitoring requirements for different categories of systems.

b. Ground water NCWSs serving ≤ 1,000 people. i. Routine monitoring. The RTCR requires ground water NCWS serving 1,000 or fewer people to routinely monitor each quarter for total coliforms and *E. coli* except that systems can transition into RTCR at their 1989 TCR monitoring frequency as discussed in further detail in the next section, and there are provisions under which the monitoring frequency may be reduced or increased. Seasonal systems under this category must routinely monitor every month that they are in operation (see section III.C.1.f of this preamble, *Seasonal systems,* for additional discussion on seasonal system requirements).

ii. Transition to the RTCR. The RTCR requires all ground water NCWSs serving 1,000 or fewer people, including seasonal systems, to continue with their 1989 TCR monitoring schedules as of the compliance date of the RTCR, unless or until any of the conditions for increased monitoring discussed later in this section are triggered on or after the compliance date, or unless otherwise directed by the State as a result of the special monitoring evaluation conducted under a sanitary survey or at any other time the State believes that the sampling the system is conducting may not be adequate. In addition, systems on annual monitoring, including seasonal systems, must have an initial annual site visit by the State within one year of the compliance date and an annual site visit each calendar year thereafter to remain on annual monitoring. Systems may substitute a voluntary Level 2 assessment by a party approved by the State for the annual site visit in any given year. The periodic sanitary survey may be used to meet the requirement for an annual site visit for the year in which the sanitary survey was completed.

After the compliance date of the final RTCR, during each sanitary survey the State must perform a special monitoring evaluation to review the status of the water system, including the distribution system, to determine whether the system is on an appropriate RTCR monitoring schedule and modify the monitoring schedule as necessary. States must evaluate system factors such as the pertinent water quality and compliance history, the establishment and maintenance of contamination barriers, and other appropriate protections, and validate the appropriateness of the water system's existing RTCR monitoring schedule and modify as necessary. For seasonal systems on quarterly or annual monitoring, this evaluation must also include review of the approved sample siting plan, which designates the time period(s) for monitoring based on site-specific considerations (such as during periods of highest demand or highest vulnerability to contamination). The system must collect compliance samples during these designated time periods.

iii. Reduced monitoring. The State has the discretion to reduce the monitoring frequency for well-operated ground water NCWSs from the quarterly routine monitoring to no less than annual monitoring, if the water system can demonstrate that it meets the criteria for reduced monitoring provided in this section.

To be eligible to qualify for and remain on annual monitoring after the compliance date, a ground water NCWS serving 1,000 or fewer people must meet all of the following criteria:

- The system must have a clean compliance history (no MCL violations or monitoring violations under the 1989 TCR and/or RTCR, no Level 1 or Level 2 trigger exceedances or treatment technique violations under the RTCR) for a minimum of 12 months. (For a more detailed discussion on Level 1 and Level 2 triggers, see section III.E of this preamble, *Coliform Treatment Technique*);
- The most recent sanitary survey shows the system is free of sanitary defects, has a protected water source and meets approved construction standards; and
- An initial site visit by the State within the last 12 months to qualify for reduced annual monitoring, and recurring annual site visits to stay on reduced annual monitoring; and correction of all identified sanitary defects. A voluntary Level 2 assessment by a party approved by the State may be substituted for the State annual site visit in any given year.

iv. Increased monitoring. Ground water NCWS serving 1,000 or fewer people on quarterly or annual monitoring must begin monthly monitoring the month after any of the following events occurs:

- The system triggers a Level 2 assessment or two Level 1 assessments in a rolling 12 month period;
- The system has an *E. coli* MCL violation;
- The system has a coliform treatment technique violation (for example, if the system fails to conduct a Level 1 assessment or correct for sanitary defects if required to do so);
- The system on quarterly monitoring has two RTCR monitoring violations; or
- The system has one RTCR monitoring violation and triggers a Level 1 assessment in a rolling 12-month period.

EPA added the last condition by which a ground water NCWS serving ≤ 1,000 people can be triggered into increased monitoring to improve the internal consistency of these triggers, given that these NCWSs monitor less frequently in general, and given the added flexibility for States to elect not to count monitoring violations at TNCWS toward triggers to increased monitoring as described in the next paragraph. Since either two Level 1 assessments or two RTCR monitoring violations in a rolling 12-month period triggers increased monitoring, EPA believes it is appropriate for one of each of these events to also trigger increased monitoring for these NCWSs. See section III.E.1 of this preamble, *Coliform treatment technique triggers,* for a discussion of coliform treatment technique triggers.

EPA also added flexibility to allow States to elect to not count TNCWS monitoring violations in determining whether the trigger for increased monitoring has been exceeded, but only if the missed sample is collected no later than the end of the next monitoring period. The system must collect the make-up sample in a different week than the routine sample for the next monitoring period and should collect the sample as soon as possible during the next monitoring period. This

provision applies only for routine samples. The TNCWS would still incur a monitoring violation and must follow the other requirements associated with such violation (e.g., public notification and reporting). This provision is added in response to comments received by EPA. See section III.C.2.b of this preamble, *Ground water NCWSs serving ≤ 1,000 people,* for additional discussion of this provision.

Ground water NCWS serving 1,000 or fewer people on annual monitoring must begin quarterly monitoring the month after the following event occurs:

• The system on annual monitoring has one RTCR monitoring violation.

This is a change from the proposed rule requirement where the event would have triggered the system to go to monthly monitoring instead of quarterly monitoring. This change is further discussed in section III.C.2.b of this preamble, *Ground water NCWSs serving ≤ 1,000 people*.

The system must continue monthly or quarterly monitoring until the requirements in this section for returning to quarterly or annual monitoring are met.

v. Requirements for returning to quarterly monitoring. To be eligible to return from increased monthly monitoring to quarterly monitoring, ground water NCWSs serving 1,000 or fewer people must meet all of the following criteria:

• Within the last 12 months, the system must have a completed sanitary survey or a site visit by the State or a voluntary Level 2 assessment by a party approved by the State. The system is free of sanitary defects, and has a protected water source; and

• The system has a clean RTCR compliance history (no *E. coli* MCL violations, Level 1 or 2 triggers, coliform treatment technique violations or monitoring violations) for a minimum of 12 months.

For TNCWSs, the State may elect not to count monitoring violations towards the requirement of a clean compliance history (as presented in the last bullet) if the missed sample is collected no later than the end of the next monitoring period. This applies only for routine samples. The TNCWS would still incur a monitoring violation and must follow the other requirements associated with such violation (e.g., public notification and reporting). See section III.C.2.b of this preamble, *Ground water NCWSs serving ≤ 1,000 people,* for additional discussion about this provision.

vi. Requirements for returning to reduced annual monitoring. To be eligible to return from increased monthly monitoring to reduced annual monitoring, the system must meet the criteria to return to routine quarterly monitoring plus the following criteria:

• An annual site visit (recurring) by the State and correction of all identified sanitary defects. An annual voluntary Level 2 assessment may be substituted for the State annual site visit in any given year; and

• The system must have in place or adopt one or more additional enhancements to the water system barriers to contamination as approved by the State. These measures could include but are not limited to the following:

—Cross connection control, as approved by the State.

—An operator certified by an appropriate State certification program, which may include regular visits by a circuit rider certified by an appropriate State certification program.

—Continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the State.

—Maintenance of at least a 4-log inactivation or removal of viruses each day of the month based on daily monitoring as specified in the GWR (with allowance for a 4-hour exception).

—Other equivalent enhancements to water system barriers to contamination as approved by the State.

vii. Additional routine monitoring. All systems collecting samples on a quarterly or annual frequency must conduct additional routine monitoring following a single total coliform-positive sample (with or without a Level 1 trigger event). The additional routine monitoring consists of three samples in the month following the total coliform-positive sample at routine monitoring locations identified in the sample siting plan. This is a change from the 1989 TCR additional routine monitoring requirement of taking a total of five samples the month following a total coliform-positive sample for systems that take four or fewer samples per month. Consistent with the 1989 TCR, the State may waive the additional routine monitoring requirement if:

• The State, or an agent approved by the State, performs a site visit before the end of the next month the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the State to determine whether additional monitoring and/or any corrective action is needed. The State cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the State to perform sanitary surveys or RTCR assessments.

• The State has determined why the sample was total coliform-positive and establishes that the system has corrected the problem or will correct the problem before the end of the next month the system serves water to the public. In this case, the State must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the State official who recommends such a decision, and make this document available to the EPA and public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem.

• The State may not waive the requirement to collect three additional routine samples the next month in which the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. If the State determines that the system has corrected the contamination problem before the system takes the set of repeat samples required in § 141.858, and all repeat samples were total coliform-negative, the State may waive the requirement for additional routine monitoring the next month.

All additional routine samples are included in determining compliance with the MCL and coliform treatment technique requirements.

c. Ground water CWSs serving ≤ 1,000 people. i. Routine monitoring. The RTCR requires ground water CWSs serving 1,000 or fewer people to routinely monitor at least once each month for total coliforms and *E. coli* except that systems can transition into RTCR at their 1989 TCR monitoring frequency as discussed in further detail in the next section, and there are provisions under which the sampling frequency may be reduced by the State.

The State may reduce the monitoring frequency for ground water CWS from the monthly routine monitoring to quarterly reduced monitoring if the water system can demonstrate that it meets the criteria for reduced monitoring provided later in this section.

ii. Transition to the RTCR. All ground water CWSs serving 1,000 or fewer people continue with their 1989 TCR monitoring schedules unless or until any of the increased monitoring requirements in this section occur or as directed by the State.

After the compliance date of the final RTCR, the State must determine

whether the system is on an appropriate monitoring schedule by performing a special monitoring evaluation during each sanitary survey to review the status of the PWS, including the distribution system. The first such evaluation must be conducted during the first scheduled sanitary survey after the effective date of the rule; a system may remain on its 1989 TCR monitoring schedule until this time unless it is triggered into more frequent monitoring. After its first evaluation, the State may allow the system to remain on its 1989 TCR monitoring schedule as long as the system meets the conditions for doing so. The State must evaluate system factors such as the pertinent water quality and compliance history, the establishment and maintenance of barriers to contamination, and other appropriate protections to validate the water system's existing monitoring schedule or require more frequent monitoring.

iii. Reduced monitoring. The State has the flexibility to reduce the monitoring frequency for well-operated ground water CWS from the monthly routine monitoring to no less than quarterly monitoring if the water system can demonstrate that it meets the criteria for reduced monitoring provided in this section.

To be eligible to change from monthly to quarterly reduced monitoring after the compliance date, ground water CWSs serving 1,000 or fewer people must be in compliance with any State-certified operator provisions and meet each of the following criteria:

- The system must have a clean compliance history (no MCL violations or monitoring violations under the TCR and/or RTCR, no Level 1 or Level 2 trigger exceedances or treatment technique violations under the RTCR) for a minimum of 12 months;
- The most recent sanitary survey shows the system is free of sanitary defects (or has an approved plan and schedule to correct them and is in compliance with the plan and the schedule), has a protected water source, and meets approved construction standards; and
- The system must meet at least one of the following criteria:

—An annual site visit by the State or an annual voluntary Level 2 assessment by a party approved by the State or meeting criteria established by the State and correction of all identified sanitary defects (or an approved plan and schedule to correct them and is in compliance with the plan and schedule).
—A cross connection control program, as approved by the State.
—Continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the State.
—Demonstration of maintenance of at least a 4-log inactivation or removal of viruses each day of the month based on daily monitoring as specified in the GWR (with allowance for a 4-hour exception) (USEPA 2006c, 71 FR 65574, November 8, 2006).
—Other equivalent enhancements to water system barriers to contamination as approved by the State.

iv. Requirements for returning to monthly monitoring. When a system on quarterly monitoring experiences any of the following events the system must begin monthly monitoring the month after the event occurs:

- System triggers a Level 2 assessment or two Level 1 assessments in a rolling 12-month period.
- System has an *E. coli* MCL violation.
- System has a coliform treatment technique violation (e.g., fails to conduct a Level 1 or Level 2 assessment or to correct for a sanitary defect if required to do so).
- System has two routine RTCR monitoring violations in a rolling 12-month period.

The system must continue monthly monitoring until all the reduced monitoring requirements discussed previously in this section are met. A system that loses its certified operator must also return to monthly monitoring the month following the loss.

v. Additional routine monitoring. Ground water CWSs serving ≤ 1,000 people collecting samples on a quarterly frequency must conduct additional routine monitoring following a single total coliform-positive sample (with or without a Level 1 trigger event), similar to the additional monitoring requirements for ground water NCWS serving ≤ 1,000 people. See section III.C.1.b.vii of this preamble, *Additional routine monitoring,* for a discussion of the additional routine monitoring requirements.

d. Subpart H systems serving ≤ 1,000 people. The monitoring requirements for subpart H systems of this part (PWSs supplied by a surface water source or by a ground water under the direct influence of surface water (GWUDI) source) serving 1,000 or fewer people remain the same as under the 1989 TCR (see § 141.856). These systems are not eligible for reduced monitoring. In addition, the rule requires all seasonal systems, on and after the compliance date of the final RTCR, to demonstrate completion of a State-approved start-up procedure (see section III.C.1.f of this preamble, *Seasonal systems,* for additional discussion on seasonal system requirements).

e. PWSs serving > 1,000 people. The monitoring requirements for PWSs serving more than 1,000 people remain the same as under the 1989 TCR (see § 141.857), with the exception of the applicable revisions to the repeat sampling locations provided in § 141.858 and to the additional routine monitoring provisions. Systems on monthly monitoring are not required to take additional routine samples the month following a total coliform-positive sample, as recommended by the advisory committee (see section III.A.3.b.ii(g) of the preamble to the proposed RTCR, *Additional routine monitoring,* for an explanation of this change from the 1989 TCR). Consistent with the 1989 TCR, systems serving > 1,000 people are not eligible for reduced monitoring. In addition, the rule requires all seasonal systems, on and after the compliance date of the final RTCR, to demonstrate completion of a State-approved start-up procedure (see section III.C.1.f of this preamble, *Seasonal systems,* for additional discussion on seasonal system requirements).

f. Seasonal systems. Since seasonal systems are a subset of NCWSs, they are subject to the requirements of the particular NCWS size category they fall under (e.g., seasonal systems using ground water and serving ≤ 1,000 people are subject to the requirements of ground water NCWS serving ≤ 1,000 people, or seasonal systems using surface water and serving ≤ 1,000 people are subject to the requirements of subpart H systems serving ≤ 1,000 people, and so on), unless otherwise noted. The RTCR is promulgating requirements specific to seasonal systems to mitigate the risk associated with the unique characteristics of this type of systems (see section III.A.4 of this preamble, *Seasonal systems,* for additional discussion about seasonal systems). One of the provisions is the requirement that all seasonal systems must demonstrate completion of a State-approved start-up procedure prior to serving water to the public on and after the compliance date of the final RTCR each time they start up the system. The start-up procedure may include a requirement for a start-up sample prior to serving water to the public.

Under the RTCR, all seasonal systems are required to take at least one routine sample per month for total coliforms and *E. coli* during the months that they are in operation, unless the sampling

frequency has been reduced by the State under the RTCR. Seasonal systems serving > 1,000 people have the same monitoring frequency as other PWSs serving > 1,000 people (see § 141.857 of the RTCR) and it cannot be reduced. However, seasonal systems serving ≤ 1,000 people that are not on monthly monitoring by the compliance date of the RTCR may continue with their existing 1989 TCR monitoring frequency afterwards, unless or until any of the conditions for increased monitoring discussed previously in section III.C.1.b.iv of this preamble, *Increased monitoring,* are triggered on or after the compliance date, or as directed by the State. To continue on their existing 1989 TCR monitoring frequency, seasonal systems on less than monthly monitoring at the compliance date of the RTCR must have an approved sample siting plan that designates the time period for monitoring based on site-specific considerations (e.g., during periods of highest demand or highest vulnerability to contamination). The system must collect compliance samples during this time period. Seasonal systems on annual monitoring frequency are required to have a recurring annual site visit by the State (or an annual voluntary Level 2 assessment by a party approved by the State) to remain on annual monitoring.

Only seasonal systems using ground water and serving ≤ 1,000 people are eligible for reduced monitoring. To be newly eligible for reduced monitoring after the compliance date, they must meet the following criteria:

- The system must have an approved sample siting plan that designates the time period for monitoring based on site-specific considerations (e.g., during periods of highest demand or highest vulnerability to contamination). The system must collect compliance samples during this time period; and
- To be eligible for reduced quarterly monitoring, the system must also meet all the reduced monitoring criteria discussed in section III.C.1.b.v of this preamble, *Requirements for returning to quarterly monitoring,* and provided in § 141.854(g) of the RTCR.
- To be eligible for reduced annual monitoring, the system must also meet all the reduced monitoring criteria discussed in section III.C.1.b.vi of this preamble, *Requirements for returning to reduced annual monitoring,* and provided in § 141.854(h) of the RTCR.

The State may exempt any seasonal system from some or all of the requirements for seasonal systems (e.g., performing start-up procedures) if the entire distribution system remains pressurized during the entire period that the system is not operating. However, systems that monitor less frequently than monthly must still monitor during the time period designated in their approved sample siting plan.

g. Consecutive systems. EPA did not identify any issues regarding consecutive systems in the RTCR. Consecutive systems must monitor for total coliforms at a frequency based on the population served by the consecutive system and the source water type of the wholesale system. In instances where it is justified to treat two or more distribution systems as a single system for monitoring purposes, 40 CFR 141.29 allows the State to modify the monitoring requirements for the combined distribution system. Any modifications to the monitoring requirements must be approved by EPA. The State may not, however, modify the compliance requirements. The RTCR is not modifying the provisions of 40 CFR 141.29. When conducting assessment and corrective action under the RTCR, wholesalers and consecutive systems should cooperate as directed by the State and conduct assessment and corrective action based on the location of the positive sample results, the potential pathways of distribution system contamination, and the sanitary defects identified.

2. Key Issues Raised

a. Sample siting plans. The majority of the comments EPA received supported the proposal that sample siting plans be subject to State review and revision instead of requiring State approval. The advisory committee recommended that States review and revise sample siting plans consistent with current practice and that the State develops and implements a process to ensure the adequacy of sample siting plans. EPA also received comments that requiring State approval of sample siting plans will be an additional burden to the States. Considering these comments and the recommendation of the advisory committee, EPA, therefore, is not changing the requirement regarding State review and revision of the sample siting plan in most instances. There are, however, instances where it is necessary for the State to review and approve elements of the sample siting plan, and other instances where the need for State approval is left to State discretion. For example, seasonal systems on less than monthly monitoring must have an approved sample siting plan that designates the time period for collecting the sample(s) as discussed previously in section III.C.1.f of this preamble, *Seasonal systems.* On the other hand, for systems that want to establish repeat sampling locations other than the within-five-connections-upstream-and-downstream of the total coliform-positive sample, the system must submit the siting plan for review and the State may modify the sampling locations as needed, but State approval is not required by the RTCR, as discussed in section III.D of this preamble, *Repeat Samples.*

EPA received comment that supported the use of dedicated sampling locations. Although not specifically addressed this practice is already in use by some States and systems under the 1989 TCR. As discussed in the proposed RTCR, EPA is specifically allowing the use of dedicated sampling stations for the following reasons:

- To reduce potential contamination of the sampling taps. Utilities will have more control to prevent contamination of the sampling tap by preventing its use by unauthorized persons and allowing no routine use of the tap except for sampling.
- To facilitate access to sampling taps. Currently systems may be constrained by where they sample, e.g., only at public buildings or in certain individual customer's house.
- To improve sampling representation of the distribution system. Allowing dedicated sampling taps in areas where systems have not been able to gain access will facilitate better sampling representation of the distribution system.

b. Ground water NCWSs serving ≤ 1,000 people. EPA received comments regarding the monitoring requirements for small ground water NCWSs. Many of the commenters agreed with the requirements proposed while some commenters suggested that systems should not be allowed to monitor less than monthly.

The advisory committee recommended that the routine monitoring frequency for ground water NCWSs serving 1,000 or fewer people remain at quarterly monitoring as provided in the 1989 TCR. EPA believes that quarterly monitoring carried out in conjunction with the assessment and corrective action requirements would maintain or improve public health protection without increasing sampling costs over the 1989 TCR requirements. The advisory committee also recognized that current sampling costs are not insignificant for small systems, and wanted to allow reduced monitoring for well-performing systems under the more specific and rigorous criteria described previously in sections III.C.1.b.iii, *Reduced monitoring,* and III.C.1.c.iii, *Reduced monitoring,* of this preamble. To continue to provide adequate health

protection, systems on reduced monitoring must adhere to criteria that ensure that barriers are in place and are effective. Furthermore, systems with problems that may indicate poor system integrity, maintenance, or operations, or systems that fail to monitor, are triggered into more frequent monitoring. This approach leverages the limited resources of small ground water NCWSs and of States, so that well-operated systems can minimize their costs and States can focus their resources on systems needing the greatest attention, such as systems with problems or vulnerabilities.

EPA requested comment in the proposed rule on whether to require NTNCWSs to comply with the CWS requirements (as they are in other rules such as disinfection byproduct (DBP) rules) since NTNCWSs serve the same people over time and include populations that may be at greater risk (e.g., schools, hospitals, daycare centers).

EPA received comments both in agreement and disagreement with this approach. Those who disagreed stated that such requirement would result in disproportionate impact on NTNCWS, since these systems are small systems with limited resources. One commenter said that the 1989 TCR has been in effect for decades now and there have been no adverse health effect impacts by not having NTNCWSs comply with CWS requirements.

Considering the comments EPA received, the Agency is not requiring NTNCWSs to comply with CWS requirements under the RTCR. However, EPA recommends that States consider the population served at NTNCWSs, especially those that serve sensitive subpopulations such as schools, hospitals, and daycare centers, when they decide on an appropriate monitoring frequency. EPA is aware that some States are already doing so and suggests that other States consider the same.

EPA received comments that the criteria for returning to reduced monitoring are overly strict, including a suggestion that the requirement to have an additional barrier enhancement to return to annual monitoring is too burdensome and costly. Some commenters stated that systems that are triggered into increased monitoring will be unlikely to return to reduced monitoring. Another commenter suggested that a system should be able to return to reduced monitoring sooner than 12 months.

EPA continues to believe that for a system to be able to monitor only once a year, it should be able to demonstrate that it has the ability to continually deliver safe water by ensuring that barriers are in place to protect against contamination. A system that has been triggered into increased monitoring has failed in some way to demonstrate that it has those barriers in place. The requirements to return to reduced monitoring are intended to show that the system has made the long-term commitment and provided the necessary additional barriers to eliminate the vulnerability to contamination that triggered the increased monitoring in the first place. EPA believes that the requirements for returning to reduced monitoring are not impossible to meet but require an appropriate level of effort over at least 12 months to show the commitment and ability to deliver safe water.

EPA received comments regarding monitoring violations as a trigger for increased monitoring and as part of the criteria for returning to reduced monitoring. EPA heard from States with large numbers of NCWSs that including monitoring violations as a trigger for increased monitoring and as part of the criteria for reduced monitoring will make the RTCR difficult to implement in their States. NCWSs, especially TNCWSs, pose unique challenges to rule compliance as they typically do not have the resources that CWSs have and providing water is not their primary business. Commenters suggested that triggering a NCWS into increased monitoring because of just one or two missed samples is not appropriate and will burden the State with compliance and enforcement tracking. They indicated that this will shift limited State resources away from oversight activities for CWSs that serve large populations to compliance and enforcement activities for NCWSs that serve small populations, resulting in decreases in public health protection. The commenters also concluded that once a system is triggered into increased monitoring, it would not be able to qualify for reduced monitoring because it would not be able to meet the requirements for clean compliance history (e.g., no monitoring violations).

EPA recognizes the burden on States that may result from implementing the increased and reduced monitoring provisions of the RTCR. EPA is therefore providing States the flexibility to not count monitoring violations towards eligibility for remaining on quarterly monitoring or for returning to quarterly monitoring as long as a make-up sample is collected by the end of the next monitoring period. This flexibility only applies to TNCWSs and only for routine samples. The State cannot use this flexibility to qualify a system for annual monitoring. When exercising the flexibility about whether to count a monitoring violation towards eligibility for reduced monitoring, the State may find it appropriate to also consider the system's history of monitoring violations. The TNCWSs would still incur a monitoring violation and must comply with the other associated requirements after such violation (e.g., public notification and reporting).

In the proposed rule, a NCWS on annual monitoring with one RTCR monitoring violation is triggered into monthly monitoring. Some commenters expressed concern that many systems on annual monitoring will be triggered to monthly monitoring because of just one missed sample. The commenters stated that this was unreasonable considering that these systems typically do not have the resources that CWSs have, such as a certified operator. These systems typically experience frequent staff shortages or turnover that result in missed samples. Having these systems do monthly monitoring would require significant tracking and enforcement activities on the part of the State.

To address this concern, EPA has changed the consequence of having one RTCR monitoring violation for systems on annual monitoring. Instead of having to go to monthly monitoring, the system now moves to quarterly monitoring. EPA also believes that the annual site visit by the State, and the fact that some States conduct and/or pay for the annual monitoring, reduces the likelihood that systems on annual monitoring will miss samples and be triggered to increase to quarterly monitoring, so that PWS and State resource needs are not likely to significantly increase because of this requirement. EPA is not changing the consequence of exceeding the other triggers for increased monitoring; systems that experienced any of the other events in section III.C.1.b.iv of this preamble, *Increased monitoring,* will need to monitor monthly instead of quarterly. Systems can go back to annual monitoring by meeting the criteria for reduced monitoring.

EPA requested comment on whether daily chlorine residual measurements should be one of the criteria for reduced monitoring. EPA received comments that said that it should not be a criterion. Some commenters expressed concern that one missed measurement might be a basis for being bumped to increased monitoring. One commenter suggested giving the State the discretion to either allow or not allow it as a criterion. Section 141.854(h)(2)(iii) of the RTCR specifies that one of the

enhancements to water system barriers to contamination is continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the State. States are given the discretion to decide how they want to implement this criterion based on site-specific considerations. States may want to require daily measurement of chlorine residual to demonstrate continuous disinfection.

One commenter expressed concern that a reduction in the number of additional routine samples (i.e., from five to three) reduces the likelihood of detecting both total coliforms and *E. coli.* The advisory committee recommended that it is appropriate to drop from five to three samples the following month to reduce monitoring costs while still maintaining a substantial likelihood of identifying a problem if a problem persists. EPA and the advisory committee recognized that a reduction in the number of samples taken could also mean a reduction in the number of positive samples found. However, EPA and the advisory committee concluded that the new assessment and corrective action provisions of the RTCR lead to a rule that is more protective of public health and to improvement in water quality despite the reductions in the number of samples taken. The Final RTCR EA occurrence modeling results support this conclusion, as they predict that more *E. coli* MCL violations will be prevented and total coliform and *E. coli*-positive hit rates will decrease when assessment and corrective action occur. See chapter 6 of the Final RTCR EA (USEPA 2012a) for more details.

c. Seasonal systems. EPA received comments that disagreed with the routine monthly monitoring frequency for seasonal systems. The commenters suggested that requiring a start-up procedure is the essential element and having seasonal systems monitor quarterly like all other NCWSs should be adequate. Other commenters agreed with monthly monitoring.

As discussed in section III.A.4 of this preamble, *Seasonal systems,* seasonal systems are more susceptible to contamination due to changes in the conditions of the source water during the period the system is in operation. Such changes include variable contaminant loading due to increased septic tank or septic field use, the seasonal nature of the demand, and the stress the system may experience. Because of the risk factors, the advisory committee decided that more frequent monitoring is appropriate for these systems, with the possibility of going on reduced monitoring if they meet certain criteria. EPA concurs with the advisory committee assessment and the final rule maintains the proposed routine monthly monitoring frequency, when they are in operation, for seasonal systems.

One commenter said that a regular sampling schedule is more easily achieved and more practical than identifying vulnerable time periods as these periods can vary from year to year. EPA believes that a system that will monitor less frequently than monthly should sample based on site-specific considerations (e.g., during periods of high demand or highest vulnerability of contamination). This increases the probability of detecting a possible contamination; hence, measures can be taken to address the possible contamination before it becomes a public health threat.

One commenter suggested that start-up procedures must include flushing, disinfection, re-flushing to eliminate disinfectant residual, and taking a sample prior to serving water to the public. EPA is not requiring specific practices regarding the start-up procedure. States are given the flexibility to determine what start-up procedures are appropriate for a particular system based on its site-specific considerations and must describe their process for determining start-up procedures in their primacy application. EPA recommends that States require seasonal systems to take a sample as part of the required start-up procedures. Systems must allow sufficient time for completing start-up procedures (including receiving sample results) and notifying the State as required prior to serving water to the public.

D. Repeat Samples

1. Requirements

Under the RTCR, all PWSs must take at least three repeat samples for each routine sample that tested positive for total coliforms. This is a change from the 1989 TCR requirements where systems serving 1,000 or fewer people must collect at least four repeat samples while the rest of the systems must collect three repeat samples.

As discussed in the preamble to the proposed RTCR, EPA believes that sampling again immediately after determining that a sample is positive (i.e., conducting repeat sampling) increases the likelihood of identifying the source and/or nature of the possible contamination. Analyses conducted by EPA indicated that once a total coliform-positive is found, there is a much greater likelihood of finding another total coliform-positive within a short period of time of the initial finding (see page 40939 of the **Federal Register** (FR) notice for the proposed RTCR (USEPA 2010a, 75 FR 40926, July 14, 2010) for more discussion on the analyses done by EPA regarding repeat samples). Repeat sampling (when it is total coliform-positive) can indicate a current pathway for potential external contamination into the distribution system. EPA recommends that States work with PWSs and laboratories to facilitate timely notification through the most expeditious method (e.g., phone, fax, or email) to ensure that repeat samples are taken in a timely manner.

The repeat monitoring requirements of the RTCR are essentially the same as the requirements of the 1989 TCR, except for some new provisions promulgated by the RTCR to provide flexibility to States and PWSs. The following requirements are not changing under the RTCR:

- PWSs must collect the repeat samples within 24-hours of being notified that their routine sample is total coliform-positive.
- The State can extend the 24-hour limit on a case-by-case basis. EPA is providing flexibility to this provision as discussed later in this section.
- The State cannot waive the requirement for a system to collect repeat samples.
- In addition to taking repeat samples, PWSs must test each routine total coliform-positive sample for *E. coli.* They must also test any repeat total coliform-positive sample for *E. coli.* If *E. coli* is present, the system must notify the State the same day it learns of the positive result, or by the end of the next business day if the State office is closed and the State does not have either an after-hours phone line or an alternative notification procedure.
- The State has the discretion to allow the system to forgo *E. coli* testing in cases where the system assumes that the total coliform-positive sample is *E. coli*-positive. If the State allows a system to forgo *E. coli* testing, the system must still notify the State and comply with the *E. coli* MCL requirements specified in § 141.858.
- The system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken. Unless different locations are specified in its sample siting plan (this is a new provision of the RTCR and is discussed later in this section), the system must also collect at least one repeat sample at a tap within five service connections upstream, and at least one repeat sample at a tap within five service connections

downstream of the original sampling site. The State may waive the requirement to collect at least one repeat sample upstream or downstream of the original sampling site if the total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system. EPA notes that it is the location of the repeat sample that is waived, not the required number of repeat samples. A PWS still needs to take the required repeat sample(s) elsewhere in the distribution system if it is unable to do so upstream or downstream of the original sampling site.

- Systems must collect all repeat samples on the same day. The State may allow systems with a single service connection to collect the required set of repeat samples over a three-day period or to collect a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least 300 milliliters (ml).
- Systems must collect an additional set of repeat samples for each total coliform-positive repeat sample. As with the original set of repeat samples, the system must collect the additional repeat samples within 24 hours of being notified of the positive result, unless the State extends the time limit. The system must repeat this process until either total coliforms are not detected in one complete set of repeat samples or, as the RTCR is adding, the system determines that the coliform treatment technique trigger has been exceeded and notifies the State. After a trigger (see section III.E, of this preamble, *Coliform Treatment Technique*) is reached, the system is required to conduct only one round of repeat monitoring after each total coliform-positive or *E. coli*-positive routine sample. If a trigger is reached as a result of a repeat sample being total coliform- or *E. coli*-positive, no further repeat monitoring related to that sample is necessary.
- A subsequent routine sample, which is within five service connections of the initial routine sample and is collected after an initial routine sample but before the system learns the initial routine sample is total coliform-positive, may count as a repeat sample instead.
- A ground water system with a single well serving 1,000 or fewer people may still use a repeat sample collected from a ground water source to meet both the repeat monitoring requirements of the RTCR and the triggered source monitoring requirements of the GWR (i.e., a dual purpose sample). Modifications to this provision under the RTCR are discussed later in this section.

As mentioned previously, the RTCR adds some new provisions to the repeat monitoring requirements to provide flexibility to the States and PWSs. One of these changes is the additional flexibility provided to States regarding the waiver or the extension of the 24-hour limit for a PWS to collect repeat samples. States are given the option to describe in their primacy application the criteria they will use to waive or extend the 24-hour limit instead of making the decisions on a case-by-case basis. This is discussed further in section V of this preamble, *State Implementation.*

Another change is the use of alternative monitoring locations. As discussed in section III.C of this preamble, *Monitoring,* the PWS may propose alternative repeat monitoring locations that are expected to better characterize or identify pathways of contamination into the distribution system. Systems may elect to specify either alternative fixed locations or criteria for selecting their repeat sampling locations on a situational basis in a standard operating procedure (SOP), which is part of the sample siting plan. By allowing systems to specify criteria for selecting their repeat sampling locations in their SOP instead of setting fixed repeat sampling locations, systems can provide a more flexible and more protective response. The system can focus the repeat samples at locations that will best verify and determine the extent of potential contamination of the distribution system based on specific situations. For discussion on additional requirements for alternative monitoring locations, see section III.C of this preamble, *Monitoring.*

There are also some modifications to the dual purpose sampling allowed under the GWR and 1989 TCR. Ground water systems required to conduct triggered source monitoring under the GWR must take ground water source samples in addition to the repeat samples required by the RTCR. However, a ground water system serving 1,000 or fewer people may use a repeat sample collected from a ground water source to meet both the repeat monitoring requirements of the RTCR and the source water monitoring requirements of the GWR (i.e., a dual purpose sample), but only if the State approves the use of a single sample to meet both rule requirements and the use of *E. coli* as a fecal indicator for source water monitoring. If the sample is *E. coli*-positive, the system violates the *E. coli* MCL under the RTCR and must also comply with the GWR requirements following a fecal indicator-positive sample. These provisions are consistent with the GWR.

If a system with a limited number of monitoring locations (such as a system with only one service connection or a campground with only one tap) takes more than one repeat sample at the triggered source water monitoring location, the system may reduce the number of additional source water samples by the number of repeat samples taken at that location that were not *E. coli*-positive. For example, if a system takes two dual purpose samples and one is *E. coli*-positive and the other is *E. coli*-negative, the system has an *E. coli* MCL violation under the RTCR and is required to take four additional source water samples, rather than five, under the GWR (see 40 CFR 141.402(a)(3)). If the system takes more than one of these repeat samples at the triggered source water monitoring location and has more than one repeat sample that is *E. coli*-positive at the triggered source water monitoring location, then the system would have both an *E. coli* MCL violation under the RTCR and a second fecal indicator-positive source sample under the GWR. The system would then need to also comply with the GWR treatment technique requirements under 40 CFR 141.403.

Results of all routine and repeat samples not invalidated by the State must be used to determine whether the coliform treatment technique trigger has been exceeded (see section III.E of this preamble, *Coliform Treatment Technique,* for a discussion of the coliform treatment technique triggers).

2. Key Issues Raised

A majority of the commenters supported the change from four to three repeat samples for systems serving 1,000 or fewer people. However, one commenter stated that decreasing the number of repeat samples would also lessen the likelihood of detecting total coliforms and *E. coli.* EPA explained the analysis that EPA has done to support the reduction in the number of repeat samples in the preamble to the proposed RTCR. In that analysis, using the Six-Year Review 2 data (USEPA 2010c), EPA showed that if the number of required repeats were reduced from four to three, there would still be almost as many (approximately 94 percent) situations leading to an assessment being triggered for the system. See section III.A.4 of the preamble to the proposed RTCR, *Repeat Samples,* for a detailed discussion of EPA's analysis on the reduction of the number of repeat

samples. Although dropping the required number of repeat samples from four to three means that some fraction of triggered assessments may be missed, the other provisions of the RTCR compensate for that change and, taken as a whole, the provisions of the RTCR provide for greater protection of public health. One such provision includes enhanced consequences for monitoring violations. For example, systems that do not take all of their repeat samples under the RTCR are triggered to conduct a Level 1 assessment. This permits an increase in public health protection over the 1989 TCR because PWSs are required to assess their systems when lack of required monitoring creates a situation where the PWS does not properly know whether it is vulnerable to contamination. Moreover, because of the substantial cost of this potential consequence, systems would be more likely to take all of their required repeat samples in the first place (see section III.E of this preamble, *Coliform Treatment Technique,* for additional discussion on the coliform treatment technique triggers).

EPA also received comments generally supporting the use of alternative sites for repeat monitoring since they provide more flexibility in determining the locations of the repeat samples, allowing for better protection of public health on a site-specific basis, subject to State review. One commenter disagreed, saying that repeat samples should be near the original positive sample site so that they can provide the necessary information to confirm the original positive sample. A few commenters are against having within-five-connections-upstream-and-downstream locations from the original positive sample as the default locations for repeat monitoring. They suggested that these default locations should be eliminated altogether and that all PWSs be allowed to take the other two repeat samples at alternative locations.

EPA believes that not all systems will use the option of taking repeat samples at alternative locations. Some PWSs, especially small NCWSs, may not avail themselves of this option for reasons of simplicity and lack of resources and expertise. They may elect to stick with the set repeat monitoring locations of five connections upstream and downstream of the original total coliform-positive sample, as it will be less burdensome on them than locating alternative sites and demonstrating that the alternative sites are more effective. Hence, EPA is maintaining within-five-connections-upstream-and-downstream locations as the default repeat sampling locations.

While the prescribed locations may work for some systems, other systems may find them too limiting. Taking repeat samples at the prescribed locations of within five-connections-upstream-and-downstream can be difficult for some systems to implement within the required 24 hours for a repeat sample because of issues such as access to the site. Therefore, EPA is allowing PWSs to propose alternative repeat monitoring locations, either as fixed locations or as criteria in an SOP, to facilitate the identification of the source and extent of any problem. EPA believes that both the within-five-connections-upstream-and-downstream repeat sampling locations and the locations as identified by an SOP can be used by the operator to better understand the extent and duration of potential pathways of contamination into the distribution system with the appropriate amount of State supervision.

EPA requested comment on whether systems should be required to obtain prior State approval for using repeat monitoring sites other than the within-five-connections-upstream-and-downstream locations of the original routine total coliform-positive site. Most of the commenters were against requiring prior State approval for the use of alternative repeat monitoring locations. They suggested that it is more appropriate to include these sites (or the criteria to choose sites) in the SOP or in the sample siting plan, which is then subject to State review and revision. Some commenters also stated that requiring pre-approval for each individual instance of using alternative sites is not practical.

EPA agrees that obtaining prior State approval to use alternative repeat monitoring locations is not necessary since there is no reduction in monitoring and EPA expects the SOP to be used only by large systems with the technical resources to justify alternative monitoring sites. Although State approval is not required, EPA requires PWSs that are intending to use this option to submit their proposed alternative sampling sites (as part of an SOP or the sample siting plan) to the State. The PWS must be able to demonstrate to the State that the alternative monitoring sites are appropriate to help characterize the extent of the possible contamination. The State is given the discretion to review and revise the alternative monitoring locations consistent with their practice regarding sample siting plans. EPA does not require that the State formally acknowledge and approve the alternative monitoring locations. The alternative monitoring locations are considered appropriate unless the State disapproves or modifies them, which results in the requirement being self-implementing.

EPA received general support for allowing samples taken at the ground water source to serve both as a triggered source sample under the GWR and as one of the repeat samples under the RTCR (i.e., as dual purpose samples). Some States said that this practice is already being done in their States and therefore should continue under the RTCR. Most commenters supported the provision with the understanding that the practice would be subject to State approval. One commenter, however, disagreed with the provision and thought the PWS would not be collecting a sufficient number of repeat samples to represent the water quality in the distribution system if one of the repeat samples is taken at the source water. Another commenter suggested making the option available for ground water systems of all sizes, as it will help reduce labor and analytical costs, and will provide a clearer picture as to the location and cause of the total coliform-positive sample.

The preamble to the proposed RTCR discussed the drawbacks to allowing dual purpose samples i.e., a reduction in the number of repeats in the distribution system. By requiring State approval of the use of dual purpose sampling, the RTCR ensures that this flexibility will only be allowed where the State has determined it is appropriate. EPA believes that PWSs with limited or no distribution systems are the best candidates for approval since there is little to no chance of contamination from the distribution system except from cross connection. On the other hand, EPA believes that dual purpose samples may not be appropriate for systems with extensive distribution systems because the reduction in monitoring (i.e., one less repeat sample in a distribution system that extends far from the source water sample site) may not provide public health protection equivalent to taking separate samples.

EPA requested comment on whether the use of dual purpose samples should be allowed by simply including it in the sample siting plan, without prior State approval. As stated earlier, most of the comments supported allowing dual purpose sampling with the understanding that it will be approved by the State. Some commenters, on the other hand, said that it should be allowed without prior State approval. One commenter said that the State may not be able to review and approve the sample siting plan until the next

sanitary survey, which maybe as long as five years after the RTCR implementation. One commenter said that States should only be required to say that dual purpose sampling is not allowed for specific systems. Another commenter suggested allowing States to explain their process for approval in their primacy application, rather than each situation being handled on a case-by-case basis, thereby reducing administrative burden.

As discussed earlier, EPA believes that requiring State approval for allowing dual purpose sampling limits the practice only to systems that can avail themselves of it without compromising public health protection. State approval is required because this constitutes a reduction in monitoring (no separate triggered source water samples), relative to requiring separate samples for compliance with the two rules. EPA believes this reduction in monitoring is appropriate only if the State determines that the dual purpose sample provides public health protection equivalent to that provided by separate repeat and source water samples.

As part of the special primacy requirements for the RTCR in § 142.16(q), States adopting the reduced monitoring provisions of the RTCR, including dual purpose sampling, must describe how they will do so in their primacy application package. States must include their approval process for dual purpose sampling in their application. This gives States the flexibility to determine how and when they want to grant approval, i.e., whether on a case-by-case basis (whenever a total coliform-positive occurs) or on a pre-approved basis (i.e., the system has prior State approval to take a dual purpose sample whenever it is triggered to do source water monitoring).

E. Coliform Treatment Technique

1. Coliform Treatment Technique Triggers

a. Requirements. The non-acute MCL violation for total coliforms under the 1989 TCR is replaced under the RTCR by a coliform treatment technique involving monitoring for total coliforms and assessment and corrective action when triggered. EPA is establishing an assessment process in the RTCR to strengthen public health protection. Under the 1989 TCR, a system is not required to perform an assessment following a monthly/non-acute MCL violation or an acute MCL violation. Under the RTCR treatment technique framework, the presence of total coliforms is used as an indicator of a potential pathway of contamination into the distribution system. As discussed in section III.B of this preamble, *Rule Construct: MCLG and MCL for E. coli and Coliform Treatment Technique,* the RTCR eliminates the associated MCLG and MCL for total coliforms. The RTCR specifies two levels of treatment technique triggers, Level 1 and Level 2, and their corresponding levels of response. The degree and depth to which a PWS must examine its system and monitoring and operational practices, i.e., the difference between a Level 1 or Level 2 assessment, depends on the degree of potential pathway for contamination. A Level 2 assessment requires a more in-depth and comprehensive review of the PWS compared to a Level 1. A discussion of the levels of assessments is found later in section III.E.2 of this preamble, *Assessment.*

The system has exceeded the trigger immediately once any of the following conditions have been met.

Level 1 treatment technique triggers

- For systems taking 40 or more samples per month, the PWS exceeds 5.0 percent total coliform-positive samples for the month; or
- For systems taking fewer than 40 samples per month, the PWS has two or more total coliform-positive samples in the same month; or
- The PWS fails to take every required repeat sample after any single routine total coliform-positive sample.

The first two treatment technique triggers were the conditions that define a non-acute MCL violation under the 1989 TCR. The third trigger provides incentive for systems to take their repeat samples to ensure that they are assessing the extent of the total coliform contamination; if they do not do so by repeat sampling, they must conduct an assessment instead to ensure there are no pathways to contamination (sanitary defects). Repeat monitoring is critical in identifying the extent, source, and characteristics of fecal contamination in a timely manner. EPA's analysis, as discussed in the preamble to the proposed RTCR (see section III.A.4 of the preamble to the proposed RTCR, *Repeat samples),* shows that the average percentage of repeat samples that are positive is much higher than that of routine samples, demonstrating that when operators are required to take a second look at their systems following the positive routine sample, they find, on average, a higher rate of coliform presence than during routine sampling. In other words, the high repeat total coliform positive rate indicates the persistence of total coliforms at such locations in the distribution system. Since under the RTCR there is no additional routine monitoring for systems that monitor at least monthly and the number of additional routine monitoring and repeat monitoring samples for the smallest systems that are not on monthly monitoring is decreased, the need to conduct repeat monitoring is more crucial than ever in providing immediate and useful information needed to protect public health.

Level 2 treatment technique triggers:

- The PWS has an *E. coli* MCL violation (see section III.F of this preamble, *Violations,* for a description of what constitutes an *E. coli* MCL violation); or
- The PWS has a second Level 1 treatment technique trigger within a rolling 12-month period, unless the initial Level 1 treatment technique trigger was based on exceeding the allowable number of total coliform-positive samples, the State has determined a likely reason for the total coliform-positive samples that caused the initial Level 1 treatment technique trigger, and the State establishes that the system has fully corrected the problem; or
- For PWSs with approved reduced annual monitoring, the system has a Level 1 treatment technique trigger in two consecutive years.

b. Key issues raised. EPA received comments that disagreed with the inclusion of the third Level 1 treatment technique trigger, i.e., failing to take every required repeat sample after any single routine total coliform-positive sample triggers a Level 1 assessment. Some of the commenters suggested that this does not pose a public health concern and should remain a monitoring violation because if a system does not conduct the required repeat monitoring, then it is doubtful that it will conduct the assessment. One commenter was concerned that a system might opt to conduct the assessment instead of taking the repeat samples and just indicate in the assessment form that no sanitary defect was found or the cause of the total coliform-positive sample could not be identified. The system then avoids the possibility of the repeat samples being total coliform- or *E. coli*-positive. They commented that since the Level 1 assessment is done by the system, doing the assessment will also be cheaper than taking the repeat samples.

EPA disagrees that the PWS will avoid taking repeat samples because of economic reasons. EPA's analysis indicates that a Level 1 assessment costs about four times as much as taking three repeat samples (see Exhibits 3–12 and

4–7 of the *Technology and Cost Document for the Final Revised Total Coliform Rule* (USEPA 2012b)). States also must review the assessment form submitted by the PWS. If the assessment and/or corrective action is/are not acceptable to the State, the State can require the PWS to redo the assessment and submit a revised assessment form. EPA also expects that in situations where the cause of the total coliform- or *E. coli*-positive result cannot be identified, the PWS will arrive at this conclusion only after due diligence on its part (i.e., the system adheres to proper procedures and standards set by the State in conducting the assessment). The State may require the PWS to provide supporting documentation and analyses to back-up its finding. Because of the cost and the effort involved in conducting a Level 1 assessment, EPA expects that systems will want to ensure that assessments are conducted only when potential problems may exist rather than for failure to take repeat samples.

One commenter suggested that EPA clarify that collecting samples outside the 24-hour required time is not a Level 1 trigger as there are instances when the repeat samples cannot be collected within 24 hours of the routine total coliform-positive sample. EPA notes that there is a provision in the RTCR, § 141.858(a)(1), that allows the State to extend the 24-hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. In such cases when the State allows the system to collect the repeat samples beyond the 24 hours, the system does not trigger a Level 1 assessment.

One commenter suggested that EPA include an additional provision that an assessment need not be triggered if the total coliform-positive occurred when there are representative levels of disinfectant residual in the distribution system, stating that historical total coliform-positive results occurred with normal levels of chlorine residuals in the distribution system and did not cause any waterborne disease. EPA disagrees that there is no public health risk in this situation. The fact that total coliforms can be detected even in the presence of a disinfectant residual is an indication that there might be a bigger, hidden problem that needs further investigation. An assessment is warranted to determine if there exists a potential pathway of contamination into the distribution system and corrective action is warranted if a sanitary defect is identified.

EPA received comments to eliminate the Level 2 treatment technique trigger where a second Level 1 assessment is triggered within a rolling 12-month period, or for systems on annual monitoring, where two Level 1 assessments in two consecutive years trigger a Level 2 assessment. Some of the commenters thought that many small systems will be triggered to conduct a Level 2 assessment multiple times. EPA believes that although the conditions (i.e., a second Level 1 trigger) that lead to the Level 2 trigger do not necessarily pose an immediate acute public health threat, it may still pose a potential serious health impact because of the persistence of the contamination and the failure of the system to address it. EPA believes that a Level 2 assessment is warranted in this case because a more in-depth examination of the system is needed to determine the cause of the persistent occurrences of total coliforms. EPA also notes that, ideally, a well-performed Level 1 assessment and appropriate corrective action will prevent most systems from developing conditions that lead to a Level 2 assessment.

2. Assessment

a. Requirements. There are two levels of assessment based on the associated treatment technique trigger: Level 1 assessment for a Level 1 treatment technique trigger and Level 2 assessment for a Level 2 treatment technique trigger. At a minimum, both Level 1 and 2 assessments must include review and identification of the following elements:

- Atypical events that may affect distributed water quality or indicate that distributed water quality was impaired;
- Changes in distribution system maintenance and operation that may affect distributed water quality, including water storage;
- Source and treatment considerations that bear on distributed water quality, where appropriate;
- Existing water quality monitoring data; and
- Inadequacies in sample sites, sampling protocol, and sample processing.

The system must conduct the assessment consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system. The PWS must complete the assessment as soon as practical after the PWS learns it has exceeded a treatment technique trigger. Failure to conduct a triggered assessment is a treatment technique violation. See section III.F.1.b of this preamble, *Coliform treatment technique violation.*

Level 1 Assessment

A Level 1 assessment must be conducted when a PWS exceeds one or more of the Level 1 treatment technique triggers specified previously. Under the rule, this self-assessment consists of a basic examination of the source water, treatment, distribution system and relevant operational practices. The PWS should look at conditions that could have occurred prior to and caused the total coliform-positive sample. Example conditions include treatment process interruptions, loss of pressure, maintenance and operation activities, recent operational changes, etc. In addition, the PWS should check the conditions of the following elements: sample sites, distribution system, storage tanks, source water, etc.

Level 2 Assessment

A Level 2 assessment must be conducted when a PWS exceeds one or more of the Level 2 treatment technique triggers specified previously. It is a more comprehensive examination of the system and its monitoring and operational practices than the Level 1 assessment. The level of effort and resources committed to undertaking a Level 2 assessment is commensurate with the more comprehensive investigation and review of available information, and engages additional parties and expertise relative to the Level 1 assessment. Level 2 assessments must be conducted by a party approved by the State: the State itself, a third party, or the PWS where the system has staff or management with the required certification or qualifications specified by the State. If the PWS or a third party conducts the Level 2 assessment, the PWS or third party must follow the State requirements for conducting the Level 2 assessment. The PWS must also comply with any expedited actions or additional actions required by the State in the case of an *E. coli* MCL violation.

Assessment Forms

The PWS must submit the completed assessment form for either a Level 1 or Level 2 assessment to the State for review within 30 days after the PWS learns that it has exceeded the trigger. Failure to submit the completed assessment form after the PWS properly conducts the assessment is a reporting violation (see section III.F.1.d of this preamble, *Reporting violation*). If the State determines that the assessment is insufficient, the State will consult with the PWS. If the State requires revisions after consultation, the PWS must submit

a revised assessment to the State on an agreed-upon schedule not to exceed 30 days from the date of the initial consultation.

The completed assessment form must include assessments conducted, all sanitary defects found (or a statement that no sanitary defects were identified), corrective actions completed, and a proposed timetable for any corrective actions not already completed. Upon completion and submission of the assessment form by the PWS to the State, the State must determine if the system has identified the likely cause(s) for the Level 1 or Level 2 treatment technique trigger and, if so, establish that the system has corrected the problem(s). Whether or not the system has identified any sanitary defects or a likely cause for the trigger, the State may determine whether or not the assessment is sufficient, and if it is not, the State must discuss its concerns with the system. The State may require revisions to the assessment after the consultation.

b. Key issues raised. The RTCR requires assessments to identify whether potential pathways of contamination into the distribution system exist after monitoring results indicate the system has exceeded a trigger. However, some commenters disagreed that requiring assessments will result in better public health protection. For one, they stated that assessments are already occurring under the 1989 TCR; hence, there is no need to formally require them. Second, assessments conducted by small systems will not likely be adequate as these systems usually do not have the resources and the capability to conduct a proper assessment. The States will then have to perform the assessments themselves (even the Level 1 assessments), thus adding to State burden. Third, assessments will reduce follow-up sampling and will allow a PWS to ''guess assess'' the cause of the positive sample.

EPA agrees that there already is some level of assessment and corrective action being performed voluntarily by proactive systems, and accounted for this fact in the economic analyses for the final RTCR (see chapter 7.4.5 of the RTCR EA (USEPA 2012a), *Assessments*). However, not all systems are proactive in addressing the probable cause(s) of the positive samples. Under the 1989 TCR, when a system has an MCL violation and any subsequent sampling did not detect total coliforms, the problem may persist despite the subsequent negative samples due to the intermittent nature of microbial contamination and may remain unaddressed. By requiring PWSs to assess their systems when they are triggered to do so, the RTCR aims to build and strengthen the capability of PWSs in ensuring that their systems maintain their integrity and that barriers are in place and are effective. These actions will better protect public health than the additional monitoring with no assessment and corrective action that is allowed under the 1989 TCR.

EPA acknowledges that small systems, especially small NCWSs may not have the knowledge and the resources that other systems, like CWSs, have. However, most small NCWSs are simple systems that often consist of just the source water and a limited distribution system. EPA anticipates then that the level of effort and expertise needed to conduct a Level 1 assessment at these systems will not be considerable. At a minimum, the Level 1 assessment should be conducted or managed by a responsible party of the PWS. While EPA does not expect the Level 1 assessor to be an expert in the requirements of SDWA, the assessor should be someone familiar enough with the system to answer the questions in the Level 1 assessment form or to gather correct information from others who work for the system.

To help in the implementation of the assessment, a PWS may conduct a Level 1 assessment while it consults with the State by phone. This is in lieu of having the State physically perform the assessment when the PWS needs assistance. Generally, the PWS would still need to fill-out the assessment form and submit it to the State. The State would still need to review the form but the process will not take as much effort as previously anticipated since the State would already be familiar with that particular assessment. It is also permissible that the State fill out the form while the PWS consults with the State by phone when doing the assessment. The State may also want to set up alternative methods for the PWS to submit the assessment form, such as via an online submission or email. The State should document its process in the primacy application.

EPA disagrees that the assessment requirements will reduce follow-up sampling. PWSs are still required to take repeat samples following a routine total coliform-positive sample. PWSs on quarterly or annual monitoring must conduct additional routine monitoring the month following the total coliform-positive sample. In addition, nothing in the treatment technique requirements precludes a PWS from taking additional compliance samples or special purpose samples such as those taken to determine whether disinfection practices are sufficient following pipe replacement or repairs (see § 141.853(b) of the RTCR).

EPA disagrees that PWSs conducting the assessment will ''guess assess'' the cause of the positive samples. Conducting an assessment is a methodical process that requires a PWS to evaluate the different elements of its operation and distribution system (§ 141.859(b)(2) of the RTCR specifies the minimum elements that an assessment must have, keeping in mind that some of the elements may not be applicable to some PWSs like small NCWSs). The RTCR requires that an assessment form be completed. The assessment form should help and guide the PWS in conducting the assessment by laying out the different elements the PWS must look into. EPA provides examples of assessment forms that States and PWSs can use to help them in conducting the assessment (these examples are given in Appendix X of the AIP (USEPA 2008c) and in Appendix A of the *Proposed Revised Total Coliform Rule Assessments and Corrective Actions Guidance Manual—Draft* (USEPA 2010d)). EPA also acknowledges that an assessment will not always identify sanitary defects or find a reason or cause for the presence of total coliforms and/or *E. coli.* In such cases, the PWS must document that fact in the completed assessment form. This, however, is not ''guess assessing'' as EPA expects that only PWSs that adhere to proper procedures and standards set by the State are eligible to arrive at this determination. It is then the responsibility of the State to determine if the assessment was acceptable.

Some commenters suggested that for systems with limited distribution systems that have a first Level 1 trigger, the Level 1 assessment should be delayed and the focus of the evaluation should be on the source water, and the Level 1 assessment should only be conducted if there is another Level 1 trigger.

The system may conduct an integrated assessment that meets the requirements of all applicable rules, such as the GWR and the RTCR, as long as the assessment is consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system, as required under § 141.859(b)(2) of the RTCR. EPA further notes that source water issues are one of the elements that need to be considered in a Level 1 (or 2) assessment where they may be a contributing factor to a coliform exceedance or other trigger. EPA expects that assessments at PWSs

with limited or no distribution systems will be relatively simple assessments and can be tailored to meet applicable requirements of both the GWR and the RTCR. EPA will address this in the revised *Revised Total Coliform Rule Assessment and Corrective Actions Guidance Manual* that is being developed.

EPA received comments both in support and against having two levels of assessment. The commenters in the second category concluded that both levels of assessment would involve the same effort. There were comments to eliminate the Level 1 assessment and emphasize the Level 2 assessment, as the Level 1 assessment will not lead to any meaningful evaluation and will only take up the State's resources. EPA disagrees that there is no need for two levels of assessment. The RTCR requires two levels of assessment to recognize that a higher level of effort to diagnose a problem should be applied to situations of greater potential public health concern such as repeated Level 1 triggers or an *E. coli* MCL violation. A Level 1 assessment is not as comprehensive as Level 2 assessment. This however, does not negate the importance of a Level 1 assessment. Triggers that lead to a Level 1 assessment may indicate the possibility of a breach of the barriers in place. It is important that PWSs ensure that these barriers remain intact by performing the assessment.

EPA received comments that the qualifications of assessors are not clear in the rule. The commenters suggested including the qualifications in the rule or referencing the qualifications described in the *Proposed RTCR Assessment and Corrective Actions Guidance Manual—Draft* (USEPA 2010d). Some commenters concluded that the Level 2 assessment will require a whole new certification program for assessors. Others concluded that the States will end up doing the Level 2 assessment because of what is expected and required of a Level 2 assessment. On the other hand, one commenter suggested that a system operator should be certified to perform an assessment of their own system. Another suggested that States be allowed to set mechanisms in place to ensure that a Level 2 assessment is performed more comprehensively than a Level 1 assessment.

EPA does not require that a separate certification program be established to determine who can perform a Level 2 assessment. Instead of being prescriptive on who can conduct a Level 2 assessment, EPA is allowing the State to determine its criteria and process for approval of Level 2 assessors and to determine who is appropriate to conduct the assessment given the State's knowledge of the complexity of the system and the knowledge and policies of the State. Although the rule allows that certified operators may perform a Level 2 assessment if approved by the State, EPA recommends that States consider whether having the assessment done by someone from outside the system can provide a fresh perspective. Qualified certified operators can be allowed to conduct assessments at other systems.

EPA requested comments on how to ensure that a Level 2 assessment is more comprehensive than a Level 1 assessment (e.g., by possibly including asset management and capacity development). EPA asked in the proposed rule whether EPA should provide more detail in guidance or rule language, on the elements and differences between a Level 1 and Level 2 assessment. A majority of the commenters were against the inclusion of asset management and capacity development in the Level 2 assessment. EPA received comments stating that the proposed rule language regarding the two levels of assessment was adequate and that additional discussion about the differences between the two should instead be addressed in guidance. One commenter, on the other hand, said that there was no difference in the scope between the two assessments based on the way the proposed rule language was written.

EPA defined in § 141.2 both a Level 1 assessment and a Level 2 assessment to provide a better distinction between the two levels of assessment and facilitate the implementation of the RTCR. See section III.A.1 of this preamble, *Assessment,* for the definitions of a Level 1 and Level 2 assessment. EPA is also requiring States to describe in their primacy application how they will ensure that a Level 2 assessment is more comprehensive than a Level 1 assessment; thus, giving the States more flexibility in implementing the rule. EPA released the *Proposed Revised Total Coliform Rule Assessments and Corrective Actions Guidance Manual—Draft* (USEPA 2010d) in August 2010 to help stakeholders understand the difference between the two levels of assessment. EPA will revise this guidance manual based on the comments received and release it soon after the final RTCR is published in the **Federal Register**.

EPA received comments to allow the extension of the assessment period beyond 30 days. A commenter suggested that intermediate deadlines for a Level 2 assessment triggered by the presence of *E. coli* be included because of the acute nature of the threat.

EPA expects that the PWS will conduct an assessment as soon as practical after the PWS receives notice or becomes aware that the system has exceeded a trigger. EPA imposes a 30-day limit because the possible occurrence of contamination, as indicated by the conditions that trigger the assessment, must be addressed immediately. The system has 30 days from the time it learns of exceeding the trigger to conduct the assessment and complete the corrective action. EPA believes that the 30-day period is sufficient time for problem identification and potential remediation of the problem in conjunction with the follow-up assessment in most cases. The system can work out a schedule with the State to complete the corrective action if more time is needed. It is very important, however, that the assessment is conducted as soon as possible within those 30 days. In the case of an *E. coli* MCL violation, the system must comply with any expedited actions or additional actions required by the State (see § 141.859(b)(4) of the RTCR). EPA also encourages PWSs to submit their completed assessment forms as soon as possible and not wait until the end of the 30-days to do so.

3. Corrective Action

a. Requirements. Under the RTCR, PWSs are required to correct sanitary defects found through either a Level 1 or Level 2 assessment. Systems should ideally be able to correct any sanitary defects found in the assessment within 30 days and report that correction on the assessment form. This is especially important when *E. coli* has been detected in samples collected from the distribution system, indicating that a potential health hazard exists. However, EPA recognizes that correcting sanitary defects within 30 days may not always be possible due to the extent and cost of the corrective action, and that some systems therefore may not be able to fix sanitary defects before submitting the completed assessment form within the 30-day interval. When the correction of sanitary defects is not completed by the time the PWS submits the completed assessment form to the State, EPA encourages the State and PWS to work together to determine the appropriate schedule for corrective actions (which may include additional or more detailed assessment or engineering studies) to be completed as soon as possible. The schedule, which is approved by the State, must include when the corrective action will be completed and any

necessary milestones and temporary public health protection measures. The PWS must comply with this schedule and notify the State when each scheduled corrective action is completed.

At any time during the assessment or corrective action phase, either the PWS or the State may request a consultation with the other entity to discuss and determine the appropriate actions to be taken. The system may consult with the State on all relevant steps that the system is considering to complete the corrective action, including the method of accomplishment, an appropriate timeframe, and other relevant information. EPA is not requiring this to be a mandatory consultation to provide ease of implementation for States. In many cases, consultation may not be necessary because the type of corrective action for the sanitary defect will be clear and can be implemented right away (e.g., replacement of a missing screen).

b. Key issues raised. EPA received comments that not all sanitary defects should have to be corrected unless it can be determined the defect directly correlates to the trigger or if the defect is otherwise regulated. Similarly, commenters suggested that EPA clarify that any requirement to correct sanitary defects found during the assessment be limited only to issues that are within the system's control. In contrast, one commenter encouraged EPA to provide authority to States to require broader corrective actions beyond fixing specific sanitary defects (e.g., requiring development and implementation of a storage tank inspection and maintenance plan).

EPA acknowledges that it may or may not be possible to conclusively link the total coliform-*E. coli*-positive sample to a given sanitary defect due to the complexity of the distribution system configuration and transport of contaminants throughout the system. That being the case, the PWS must still correct all sanitary defects found through the assessment even if the defect cannot be proven to be the likely cause of the positive sample, to prevent the defect from providing a pathway for future contamination. The RTCR takes a more preventive approach to protect public health by requiring that systems perform an assessment of their system when their monitoring results indicate a potential pathway of contamination into the distribution system, or a breach in the barriers that are in place, and correct all identified sanitary defects, regardless of whether the defect is directly related to the positive sample or not. This is because EPA believes that correcting only sanitary defects that are correlated to the positive sample is not sufficiently protective of public health. Uncorrected sanitary defects may provide a pathway for future incidences of contamination.

The RTCR requires that sanitary defects be corrected but does not mandate how the defects are to be corrected. States and PWSs may have other authorities under local ordinances and State laws that they may use to address the problem. For example, in cases where the location of the sanitary defect is outside the normal control of the PWS (e.g., cross connection occurring on private property), community water systems that are part of the local government may have some authority to address the problem under the public health code if the issue is affecting the water in the distribution system (AWWA 2010) or through other local ordinances such as plumbing codes. EPA encourages States and PWSs to work together to determine the best course of action when correcting sanitary defects.

Some commenters said that it is unclear how a water utility should demonstrate that it has corrected a sanitary defect and how the primacy agency would take enforcement action on any defects identified by the system. One commenter suggested that EPA clarify whether a sanitary defect would be considered corrected if subsequent samples are total coliform-negative. EPA notes that because of the intermittent nature of microbial contamination, it may not be adequate to just rely on follow-up samples to verify that the problem has been corrected or has gone away. Depending on the nature of the sanitary defect, States may require additional measures to ensure that the integrity of the distribution system has been restored (e.g., pressure monitoring, follow-up inspection of tanks, etc.). States have discretion on how to determine that defects have been corrected (e.g., site visits, sanitary surveys, etc.). Failure to correct identified sanitary defects is a treatment technique violation and States are expected to use their legal authority to take enforcement action to return the system to compliance.

F. Violations

1. Requirements

EPA is establishing the definition of the following violations—MCL violation, treatment technique violation, monitoring violation, and reporting violation—consistent with the proposed RTCR. Each type of violation requires public notice, the level of which depends on the severity of the violation (see section III.G of this preamble, *Providing Notification and Information to the Public,* for information on public notification), and may trigger a system on reduced monitoring to increase its monitoring frequency (see section III.C of this preamble, *Monitoring,* for information on monitoring frequency). In addition to these violations, systems are required to comply with all the requirements of the RTCR, e.g., to use an approved analytic method to test for total coliforms and *E. coli,* to monitor according to a sample siting plan, etc. EPA also would like to clarify that exceeding a trigger and being required to conduct an assessment is not a violation by itself; as described later in this section, a violation occurs when a system exceeds the trigger but does not complete the required assessment and corrective action in response.

a. E. coli MCL violation. A system incurs an *E. coli* MCL violation if any of the following occurs:

- A routine sample is total coliform-positive and one of its associated repeat samples is *E. coli*-positive.
- A routine sample is *E. coli*-positive and one of its associated repeat samples is total coliform-positive.
- A system fails to take all required repeat samples following a routine sample that is positive for *E. coli.*
- A system fails to test for *E. coli* when any repeat sample tests positive for total coliforms.

b. Coliform treatment technique violation. A system incurs a coliform treatment technique violation when any of the following occurs:

- A system fails to conduct a required assessment within 30 days of notification of the system exceeding the trigger (see section III.E of this preamble, *Coliform Treatment Technique,* for conditions under which monitoring results trigger a required assessment).
- A system fails to correct any sanitary defect found through either a Level 1 or 2 assessment within 30 days (see also section III.E of this preamble, *Coliform Treatment Technique*) or in accordance with State-derived schedule.
- A seasonal system fails to complete a State-approved start-up procedure prior to serving water to the public. This is further discussed later on in the *Key issues raised* part of this section.

There is no treatment technique violation associated solely with a system exceeding one or more action triggers (Level 1 or Level 2 triggers).

c. Monitoring violation. A system incurs a monitoring violation when any of the following occurs:

• A system fails to take every required routine or additional routine sample in a compliance period.

• A system fails to test for *E. coli* following a routine sample that is total coliform-positive.

d. Reporting violation. A system incurs a reporting violation when any of the following occurs:

• A system fails to timely submit a monitoring report or a correctly completed assessment form after it properly monitors or conducts an assessment by the required deadlines. The PWS is responsible for reporting this information to the State regardless of any arrangement with a laboratory.

• A system fails to timely notify the State following an *E. coli*-positive sample. See section III.H.1.a of this preamble, *Reporting,* for reporting requirements in the case of an *E. coli*-positive sample.

• A seasonal system fails to submit certification of completion of State-approved start-up procedure. This is further discussed in the *Key issues raised* part of this section.

2. Key Issues Raised

EPA received comments that supported the proposed definition of the violations. Others offered suggestions to ease implementation burden. For example, one commenter recommended that only one violation be generated for each compliance situation (i.e., if an MCL violation is determined, then neither treatment technique, nor monitoring, nor reporting violation can be generated; if a treatment technique violation is determined, then neither monitoring nor reporting violation can be generated). However, EPA believes that it is important to track each of these situations individually so that the State can be aware of the system's progress resolving situations and complying with all rule requirements. Each situation is also accompanied by public notification requirements so that consumers can be aware of problems at the water system and the progress and efforts to correct them. EPA believes it is important to continue to notify the public of each situation.

Some commenters were uncertain about when failure to take all repeat samples triggers the associated Tier 1 PN (i.e., when the 24-hour clock starts). Some questioned how the State will know when the failure to collect these repeats has occurred in such a way to assure timely Tier 1 PN when the sample results do not need to be reported until the 10th day of the month following the month in which the samples were collected. EPA believes that State programs have been designed to address timely response to follow-up requirements such as the need to take repeat samples, through education, compliance assistance, and tracking and enforcement programs. The time limit is established to assure that systems act promptly to investigate positive samples. Some States require direct electronic reporting of results, which provides for more timely notification, and EPA encourages such practice. In the situations where it is not possible for the system to take the repeat samples within 24 hours, States have the discretion to waive the requirement (see section III.D of this preamble, *Repeat Samples*).

Other commenters suggested adding to the list of violations. EPA received comment that there should be a violation when a seasonal system fails to perform the start-up procedure. EPA agrees and is designating such failure as a treatment technique violation. EPA is also requiring seasonal systems to certify that they have completed the start-up procedure and submit this certification to the State. Failure to do so is a reporting violation. EPA believes that performing start-up procedures is very important to mitigate the possible risks resulting from the seasonal system being shutdown, depressurized, or drained. Designating such failure as a violation will compel seasonal systems to make sure that they take the necessary steps to mitigate public health risks before serving water to the public.

Other commenters, on the other hand, suggested deleting the MCL violation resulting from failure to take all required repeat samples following a routine *E. coli*-positive sample. One commenter suggested that instead of an MCL violation, this should be considered a sanitary defect that requires corrective action. EPA considers *E. coli* as an indicator of a potential pathway of fecal contamination that should be taken seriously. A system needs to follow up with repeat samples to characterize the extent and source of such contamination. Failure to take the required repeat samples following an initial *E. coli*-positive sample is not protective of public health and is a serious violation. Making such failure an *E. coli* violation prevents a system from incurring only a monitoring violation when there is an indication of fecal contamination.

Some commenters do not agree with the treatment technique violation because they do not agree that the treatment technique requirements of the RTCR are appropriate. For a discussion on the treatment technique, see section III.E of this preamble, *Coliform Treatment Technique.* One commenter asked for clarification on whether failure to submit the assessment form within 30 days is a treatment technique violation. As stated previously, this is a reporting violation, not a treatment technique violation, if the assessment has in fact been completed and the only failure was in submitting the required form. A treatment technique violation occurs when a potential pathway of contamination into the distribution system is unexplored and/or uncorrected. A system that neglects to perform the prescribed assessment or corrective action within schedule is in violation of the treatment technique requirement.

Commenters also supported EPA's proposal of separating the combined monitoring and reporting violation under the 1989 TCR into two separate violations. One commenter noted that it has been difficult to determine the significance of a violation when two types of violations—monitoring and reporting—are captured and reported under only one heading. It is, therefore, difficult to develop performance measures and ensure data quality when the two violations are combined.

G. Providing Notification and Information to the Public

1. Requirements

EPA is promulgating changes to the public notification (PN) requirements contained in 40 CFR part 141 subpart Q to correspond to the violation provisions of the RTCR (see section III.F of this preamble, *Violations*). EPA is requiring a Tier 1 PN for an *E. coli* MCL violation, Tier 2 PN for a treatment technique violation for failure to conduct assessments or corrective actions, and a Tier 3 PN for a monitoring violation or a reporting violation.

Tier 1 PN is required for NPDWR violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure, such as could occur with exposure to fecal pathogens. Tier 1 PN is required as soon as possible but no later than 24 hours after the system learns of the violation. An *E. coli* MCL violation indicates possible exposure to pathogens in drinking water that can possibly result in serious, acute health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms and possible greater health risks for infants, young children, the elderly, and people with severely compromised immune systems.

In the 1989 TCR, if a system has an acute MCL violation, which is based on

the presence of fecal coliforms or *E. coli,* or the system's failure to test for fecal coliforms or *E. coli* following a total coliform-positive repeat sample, the system is required to publish Tier 1 PN. Under the RTCR, a system is required to publish Tier 1 PN when it has an *E. coli* MCL violation. (See section III.F of this preamble, *Violations,* for a discussion of MCL violations.) In addition, the system will continue to be required to notify the State after learning of an *E. coli*-positive sample, as required under the 1989 TCR. As mentioned earlier in section III.B of this preamble, *Rule Construct: MCLG and MCL for E. coli and Coliform Treatment Technique,* EPA is eliminating the MCL for fecal coliforms. Under the RTCR, the standard health effects language, which is required to be included in all public notification actions, is modified to delete the reference to the fecal coliform MCL and fecal coliforms. The language for a non-acute violation under the 1989 TCR is modified to apply to a violation of the assessments and corrective action requirements of the coliform treatment technique.

Tier 2 PN is required for all NPDWR violations and situations with potential to have serious adverse effects on human health not requiring Tier 1 PN. The system must provide public notice as soon as practical, but no later than 30 days after the system learns of the violation. A treatment technique violation under the RTCR meets these criteria because it is an indication that the public water system failed to protect public health when the system failed to conduct an assessment or complete corrective action following identification of sanitary defects. Sanitary defects indicate that a pathway may exist in the distribution system that has potential to cause public health concern.

In the 1989 TCR, a system is required to publish a Tier 2 PN when the system has a non-acute MCL violation, which is based on total coliform presence. Under the RTCR, a system is required to publish a Tier 2 PN if the system violates the coliform treatment technique requirements. Also, EPA is modifying the standard health effects language for coliform to emphasize the assessment and corrective action requirements of the RTCR.

Tier 3 PN is required for all other NPDWR violations and situations not included in Tier 1 or Tier 2. The existing Tier 3 PN requires a system to provide public notice no later than one year after the system learns of the violation or situation or begins operating under a variance or exemption. Monitoring and reporting violations have historically been designated as Tier 3 PN unless an immediate public health concern has been identified (e.g., failure to monitor for *E. coli* after a total coliform-positive sample requires a Tier 1 notification.) Where no such immediate public health concern has been identified, EPA believes that a public notice given at least annually for monitoring and reporting violations fulfills the public's right-to-know about these violations.

In the 1989 TCR, a system is required to publish a Tier 3 PN when the system has a monitoring and reporting violation. In the RTCR, monitoring violations are considered distinct from reporting violations. Both types of violations require Tier 3 PN.

Consumer confidence report (CCR) requirements are also modified. Health effects language for the CCR for total coliforms and *E. coli,* which is identical to the health effects language required for PN, is updated in the same way as described for PN. In addition, the RTCR removes the CCR requirements for the inclusion of total numbers of positive samples, or highest monthly percentage of positive samples for total coliforms as well as total number of positive samples for fecal coliforms. These provisions are replaced by requirements to include the number of Level 1 and Level 2 assessments required and completed, the number of corrective actions required and completed, and the total number of positive samples for *E. coli.* A system that fails to complete all the required assessments or correct all identified sanitary defects has a treatment technique violation and must identify it in the CCR as: (1) Failure to conduct all of the required assessment(s); and/or (2) failure to correct all identified sanitary defects. A system that has an MCL violation must also include the condition that resulted in the MCL violation (see section III.B.1 of this preamble, *MCLG and MCL,* and § 141.860(a) of the RTCR). Unchanged and consistent with the provisions under the 1989 TCR, a CWS may provide Tier 3 PN using the annual CCR.

CCR requirements are updated to reflect the advisory committee's recommendations that total coliforms be used as an indicator to start an evaluation process that, where necessary, will require the PWS to correct sanitary defects. EPA believes it is most appropriate to inform the public about actions taken, in the form of assessments and corrective actions, since failure to conduct these activities lead to treatment technique violations under the RTCR. Because the RTCR no longer includes the total coliform MCL but now includes a trigger, EPA believes that systems no longer need to report the number of total coliform-positive samples via the CCR, since that could cause confusion or inappropriate changes in behavior among consumers. In addition, the CCR requirements will also reflect the removal of fecal coliform.

2. Key Issues Raised

In general, EPA received comments in support of the PN requirements of the RTCR. The commenters stated that the changes are consistent with the intent and recommendations of the TCRDSAC. However, there were a few commenters who disagreed on certain aspects of the requirements. These comments are discussed in detail in the following paragraphs.

EPA requested comment on whether the elimination of the PN associated with the presence of total coliforms (i.e., the Tier 2 PN associated with the non-acute MCL violation under the 1989 TCR) will result in a loss of information to consumers. Although the majority of the commenters said that it would not result in a loss of information, some commenters said that it would. One commenter said that the PN associated with the presence of total coliforms has been an effective tool to motivate PWSs to take corrective actions; to eliminate such PN and replace it with a PN associated with treatment technique violations is not ''equal to or better'' public health protection. One commenter believed that if the non-acute PN requirement is eliminated, then NCWSs would not have the tool to communicate to the public the possible health risk as these PWSs are not required to send out a CCR.

As EPA discussed in section III.B of this preamble, *Rule Construct: MCLG and MCL for E. coli and Coliform Treatment Technique,* the presence of total coliforms is not, by itself, a public health threat. EPA agrees with comments received that suggest that the Tier 2 PN for a non-acute MCL violation under the 1989 TCR is sometimes unnecessarily alarming as it attributes greater public health significance to the presence of total coliforms than is warranted. EPA believes the removal of the Tier 2 PN for a non-acute MCL violation will help prevent public confusion.

EPA received comments that under the 1989 TCR some States require a Tier 1 PN when a NCWS has a non-acute MCL violation. EPA would like to note that the 1989 TCR requires a Tier 2 PN for a non-acute MCL violation, not a Tier 1 PN. Some States using their own authority have chosen to elevate the PN

level to Tier 1 for a non-acute MCL in some or all cases. In certain circumstances, some States use this elevated PN in association with other follow-up actions involving agreements with other State and local agencies, to provide a more comprehensive and immediate response to potential public health threats, or to make the most efficient use of their existing authorities to protect public health. It is not EPA's intent to take this discretion away from the States, or to undermine these cooperative agreements with other State and local agencies. If a State deems that a given situation calls for a more elevated level of PN, or requires a more immediate action to ensure that public health is protected, then they can do so under their own discretion and authority. For example, the Level 2 assessment requirements in § 141.859(b)(4) allow States to require expedited actions or additional actions to ensure that public health is protected.

EPA notes that NCWSs are required, like CWSs, to publish a PN, either a Tier 1, Tier 2, or Tier 3, depending on the violation. Even if they are not required to issue a CCR, NCWS must provide PN in other forms or methods consistent with the requirements of 40 CFR 141.153. States can also direct the PWS to perform additional public health measures (e.g., boil water orders, elevated PNs, etc.) as allowed under SDWA and the authority granted to them by their own legislation similar to EPA's authority under section 1431 of SDWA.

EPA requested comment on whether to require special notice to the public of sanitary defects similar to the special notice requirements for significant deficiencies under the GWR. Most commenters were against including such provision. They stated that it would cause confusion and unnecessary alarm to customers. Several commenters noted that it is not appropriate for sanitary defects under the RTCR to have similar notice requirements as that of significant deficiencies under the GWR. The special notice requirement for significant deficiencies under the GWR only applies to NCWSs since they are not required to send out a CCR. EPA agrees that no special notice of sanitary defects is necessary and is not including such provision in the RTCR.

EPA received comments suggesting modifications to the standard PN and CCR health effects language regarding total coliforms and the treatment technique violations included in the proposed RTCR. EPA has modified the standard health effects language found in Subpart O and Subpart Q of part 141 to make the language consistent with the use of total coliforms in the RTCR as an indicator of a potential pathway through which a contamination can enter the distribution system.

H. Reporting and Recordkeeping

1. Requirements

a. Reporting. In addition to the existing general reporting requirements provided in 40 CFR 141.31, the RTCR requires a PWS to:

- Notify the State no later than the end of the next business day after it learns of an *E. coli*-positive sample.
- Report an *E. coli* MCL violation to the State no later than the end of the next business day after learning of the violation. The PWS must also notify the public in accordance with 40 CFR part 141 subpart Q.
- Report a treatment technique violation to the State no later than the end of the next business day after it learns of the violation. The PWS must also notify the public in accordance with 40 CFR part 141 subpart Q.
- Report monitoring violations to the State within ten days after the system discovers the violation, and notify the public in accordance with 40 CFR part 141 subpart Q.
- Submit completed assessment form to the State within 30 days after determination that the coliform treatment technique trigger has been exceeded.
- Notify the State when each scheduled corrective action is completed for corrections not completed by the time of the submission of the assessment form.
- A seasonal system must certify that it has completed a State-approved start-up procedure prior to serving water to the public.

EPA is adding the submission of the assessment form and the certification of completion of start-up procedure to the reporting requirements under § 141.861 of the RTCR for better clarity and ease of tracking compliance. In the proposed rule, the submission of the assessment form is found only in § 141.859, *Coliform treatment technique requirements for protection against potential fecal contamination.* The inclusion of the submission of the assessment form in § 141.861 does not impose additional requirements beyond those that are imposed by the treatment technique requirements (see section III.E of this preamble, *Coliform Treatment Technique,* for discussion on the treatment technique requirements). Failure to submit the assessment form or the certification is a reporting violation as discussed in section III.F.1.d of this preamble, *Reporting violation.*

b. Recordkeeping. EPA is maintaining the requirements regarding the retention of sample results and records of decisions related to monitoring schedules found in 40 CFR 141.33, and including provisions that address the new requirements of the RTCR pertaining to reduced and increased monitoring, treatment technique, etc. In addition, systems are required to maintain on file for State review the assessment form or other available summary documentation of the sanitary defects and corrective actions taken. Systems are required to maintain these documents for a period not less than five years after completion of the assessment or corrective action. Since systems have to maintain these files no less than five years, which is the maximum period allowed between sanitary surveys (i.e., five years; see 40 CFR 142.16(b)(3) and 40 CFR 142.16(o)(2)), States have the opportunity to review these files during sanitary surveys and/or annual visits. The five-year period is also consistent with the recordkeeping requirements for microbiological analyses under 40 CFR 141.33(a).

The system must also maintain a record of any repeat sample taken that meets State criteria for an extension of the 24-hour period for collecting repeat samples.

2. Key Issues Raised

EPA received comments that support the reporting and recordkeeping requirements proposed by EPA. Most commenters said that the timeframes are appropriate and are consistent with EPA's practice regarding reporting and recordkeeping requirements in other regulations under SDWA. One commenter, however, said that EPA should standardize the recordkeeping requirements in all its rules, including the RTCR, for a period equal to the compliance cycle (i.e., nine years). The commenter adds that by standardization and being consistent with the compliance cycle, all monitoring and compliance records including corrective actions will be easily maintained, tracked, and available for State's inspections without the confusion of varying recordkeeping durations with different regulations. However, EPA's suite of drinking water regulations addresses different kinds of contaminants with different inherent characteristics, occurrence, and health effects. Because of these differences, monitoring of these contaminants occurs at different frequencies; hence, different reporting and recordkeeping requirements. The reporting and recordkeeping requirements specific to a

drinking water regulation are therefore meant to support the implementation of that regulation. If possible, EPA makes every effort to ensure consistency of requirements across the drinking water regulations.

I. Analytical Methods

1. AIP-Related Method Issues

a. Evaluation of currently approved methods. The AIP recommended that the Agency conduct a reevaluation of all the approved methods to ensure continued approval was warranted. In the proposed rule, the Agency identified the Environmental Technology Verification (ETV) program as the preferred mechanism for conducting such an evaluation and solicited comments on the approach.

Key issues raised. While several commenters expressed support for a method reevaluation study conducted through the ETV program, some commenters expressed concern regarding the use of this program. One commenter stated that the reevaluation study should meet criteria established by EPA, not an EPA-contractor, who would receive financial benefit from the method manufacturers for conducting the testing. This commenter further expressed concern with using the ETV program because ''the intent of the ETV program was never to certify, approve, guarantee, or warrantee analytical technologies.'' This commenter also suggested that the ETV program does not have the resources to develop the protocol for the method re-evaluation study.

A second commenter expressed concern that the ETV program was established to facilitate incorporation of commercially-ready test kits into the market, which differs from the task of determining what are appropriate performance criteria for SDWA compliance methods. This commenter also expressed concern that the ETV program has not generated rigorous enough product evaluations adequate to support approval of alternative analytical procedures.

Lastly, this commenter also suggested that the ETV studies do not have the same level of independence in protocol development as other third party studies, stating that in ETV studies, reviewers modify the protocol at the beginning of each study, and that for the recent verification study, there was not a clear discussion between the study organizers and the technical review panel regarding development of the final test protocol.

EPA will take the comments concerning the ETV program into consideration as the Agency develops a final approach to the reevaluation of methods. EPA notes that ETV work is accomplished through cooperative agreements between EPA and private non-profit testing and evaluation organizations. ETV partners verify performance claims but do not endorse, certify or approve technologies. EPA has the regulatory authority and the responsibility to approve/disapprove methods and typically does so based on a review of method performance data generated by third party laboratories. Testing under the ETV program is typically paid for by participating vendors.

ETV expert panels typically include representatives from industry, academia, EPA, and other stakeholders and collaborators. The rigor of an ETV study is determined by the objectives of the study and the resources available. If such a study is conducted, EPA, by virtue of participation in the expert panel, would ensure that the study is rigorous enough to meet the Agency's needs.

EPA held a series of three open technical webinars in fall 2010. Participants recommended the development of a coliform strain library. The Water Research Foundation has funded a project to accomplish this task and the Agency will be monitoring the progress of that work as it considers the appropriate course of action.

b. Review of the ATP protocol. The AIP recommended that the Agency engage stakeholders in a technical dialogue in its review of the Alternate Test Procedure (ATP) microbiological protocol. The proposed rule described how EPA could use the study plan development from the aforementioned method reevaluation study as a starting point for discussions with stakeholders regarding the basis for evaluating new methods. The proposed rule also explained that the study plan, along with ''lessons learned'' from the reevaluation study, could be used as a model for a revised ATP protocol.

Key issues raised. One commenter suggested that the protocol used in the method reevaluation study should be used as the revised ATP protocol. EPA intends to consider this recommendation as it decides how to move forward on revising the microbial test protocol.

c. Approval of ''24-hour'' methods. The AIP recommended that EPA consider the approval of analytical methods that allow more timely (e.g., on the order of 24 hours) results. As expressed in the rule proposal, EPA has concern that the more rapid ''24-hour'' methods may not have the same recovery rates, especially for stressed or injured organisms, as the historic methods that allow for longer incubation times.

Key issues raised. One commenter suggested that the Agency withdraw approval for the older approved methods that can require longer times to obtain results. EPA intends to consider this recommendation as it decides how to move forward.

d. Elimination of fecal coliforms. As explained in the rule proposal, EPA plans to eliminate all provisions for fecal coliform monitoring under this regulation. No comments were received on this issue. As such, all provisions relating to fecal coliforms are removed in this final rule.

e. Request for comment on other AIP-related method issues. i. Expedited results notification process. The proposed rule requested comment on whether the RTCR should include provisions to ensure a more expedited notification process. The RTCR could, for example, include language requiring that PWSs arrange to be notified of a positive result by their laboratory within 24 hours.

Key issues raised. The Agency received many comments regarding this element of the proposed rule. Many commenters expressed support for this provision, with some States reporting that this provision is an existing component of their State regulations. Several commenters expressed that given the widespread availability of electronic communication it would be easy for a laboratory to notify the public water system quickly of the results of the sample analyses.

Many comments expressed concern over the ability of the States to enforce such a provision. Additionally, several commenters noted that this provision would hold the water system accountable for the actions of the laboratory, which the public water system does not have immediate control over.

EPA believes that the public is well served by timely reporting of results but recognizes some of the challenges associated with addressing this via regulation. Accordingly, the Agency intends to use guidance documents associated with this regulation to address this issue. Through the guidance documents, the Agency expects to urge public water systems to establish language in their contract with the laboratories requiring that the water system be notified by the laboratory within 24 hours of any positive results.

Additionally, the Agency plans to encourage the certified laboratory community to ensure that laboratories

are aware of the importance of timely notification of any positive results to their clients.

ii. Taking repeat samples within 24 hours. During the Advisory Committee meetings, the factors impacting the timeframe between a coliform detection and the collection of the repeat sample were discussed. It was noted that in some cases, repeat samples are not collected for several days after notification of a coliform detection. EPA requested comment in the proposed rule whether the RTCR should require repeat samples be taken within 24 hours of a total coliform-positive with no (or limited) exceptions.

Key issues raised. While some commenters expressed support for such a provision in the final rule, most commenters noted that the final RTCR should retain flexibility around this requirement, as allowed in the 1989 TCR.

Several commenters noted that including such a provision in the final RTCR would create a hardship on systems, with many mentioning that weekend sample collection is a challenge for many small systems. Concern was expressed that this provision in the final rule would result in more monitoring violations but not necessarily change repeat sample collection practice.

Based on consideration of the concerns expressed, EPA is not changing the provision that States may extend the 24-hour limit if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. See sections III.D of this preamble, *Repeat Samples,* for additional discussion.

2. Other Method Issues

a. Holding time. In the proposed rule, EPA clarified the language defining when the sample holding time ends. The 1989 TCR states ''the time from sample collection to initiation of analysis may not exceed 30 hours,'' and this language was clarified in the proposed rule to state ''The time from sample collection to initiation of test medium incubation may not exceed 30 hours.''

Key issues raised. Two comments were received on this rule provision, with one commenter explaining that some water systems have a difficult time meeting the 30-hour hold time, and this provision may further impact their ability to meet the holding time. The second commenter stated that the number of coliforms does not likely change in ''a 30 minute window'' and that this provision will not improve public health.

As explained in the proposed rule, EPA recognizes that this provision may slightly decrease the amount of time that a water system has to get the sample to the lab, by approximately 30 minutes or less. EPA believes the impact of this provision is minimal, as a well managed laboratory will be able to recognize a sample that is received near the end of the holding time and make this sample a priority for analysis.

The inclusion of this provision in the final rule serves to ensure consistency in the analyses of the compliance samples on a national basis and will have a minimal impact on water systems. As such, the provision is included in the final rule.

b. Dechlorinating agent. The proposed rule included a provision that would require the use of a dechlorinating agent when samples of chlorinated water are collected.

Key issues raised. The Agency did not receive any adverse comment to this provision of the proposed regulation. Accordingly, this provision has been included in the final rule. EPA notes that the wording of this provision in the final rule differs slightly from that included in the proposed rule. The wording was changed to clarify that the use of a dechlorinating agent is applicable to water systems that use any type of chlorination (including chloramines) to disinfect their drinking water supplies. The proposed rule did not include language that was specific enough to ensure that this point was clear.

c. Filtration funnels. In the proposed rule, EPA added a footnote to the methods table that clarifies that the funnels used in the membrane filtration procedure should be sterilized by autoclaving, not by using ultraviolet (UV) light. The addition of this provision to the rule makes the rule requirements consistent with what is recommended by the Agency in the *Manual for the Certification of Laboratories Analyzing Drinking Water* (EPA 815–R–05–004, 5th Edition, 2005).

Key issues raised. The Agency only received one comment on this provision, requesting clarification that would allow the use of disposable filtration units that are purchased pre-sterilized by the manufacturer. EPA believes that these units can be appropriate for use in drinking water sample analyses, and therefore has modified the provision to reflect usage of such units. The provision now reads as follows:

All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving. Exposure of filtration equipment to UV light is not adequate to ensure sterilization. Subsequent to the initial autoclaving, exposure of the filtration equipment to UV light may be used to sanitize the funnels between filtrations within a filtration series. Alternatively, disposable membrane filtration equipment that is pre-sterilized by the manufacturer (i.e., disposable funnel units) may be used.

d. Analytical methods table changes. The proposed rule reflected many modifications to the table of analytical methods to clarify which methods were approved for use under this regulation.

No comments were received on the following changes to the methods table. Accordingly these modifications have been incorporated into the final rule.

- The table is organized by methodology.
- *E. coli* methods are included in the analytical methods table.
- The 18th and 19th editions *of Standard Methods for the Examination of Water and Wastewater* are no longer approved and are not included in the final rule.
- The references to Standard Methods 9221A and 9222A are removed.
- The reference to Standard Methods 9221B is changed to 9221B.1, B.2.
- The reference to Standard Methods 9221D is changed to 9221D.1, D.2.
- The citation for MI agar is changed to EPA Method 1604.
- The table clarifies that Standard Methods 9221 F.1 and 9222 G.1*c*(1), and 9222 G.1*c*(2) may be used for *E. coli* analysis.
- The table clarifies the correct formulation for *E. coli* medium with 4-methylumbelliferyl-Beta-D-glucuronide (EC–MUG) broth, when used in conjunction with Standard Methods 9222G.1*c*(2), through the addition of the following footnote: The following changes must be made to the EC broth with MUG (EC–MUG) formulation: Potassium dihydrogen phosphate, KH2PO4 must be 1.5g and 4-methylumbelliferyl-Beta-D-glucuronide must be 0.05 g.
- The table reflects the approval of a modified Colitag method for the simultaneous detection of *E. coli* and other total coliforms.

The proposed rule also contained a provision to allow the use of Standard Methods 9221D in an enumerative format, specifically, in the multiple tube format as described in Standard Methods 9221B.

Key issues raised. One comment was received, stating that the use of Standard Methods 9221D in an enumerative (multiple tube) format should be evaluated through an Alternate Test Procedure (ATP) study or be added to the proposed method reevaluation study. Given that this

method is a part of Standard Methods 9221, entitled ''Multiple-Tube Fermentation Technique for Members of the Coliform Group,'' the Agency believes it is appropriate for this method to be used in an enumerative, multiple tube format. Additionally, as explained in the proposed rule, there have been publications demonstrating that this method is effective in a multiple tube format.

Since use of this method in a multiple-tube format does not change the formulation of the medium, nor the volume of sample analyzed, the Agency has determined that an ATP evaluation is not necessary. Therefore, the provision is included in the final rule.

e. Holding temperature. In the proposed rule, the Agency requested comment as to whether the RTCR should require the samples to be held at 10 degrees Celsius (C) or less during transit.

Key issues raised. Several commenters expressed support for this provision stating that it would improve the integrity of the data collected under this rule. However, many commenters expressed concern that the addition of this provision would cause a hardship, especially to small systems, as it would increase the cost of the sample shipment. Additionally, concern was expressed that this provision would increase the number of ''failure to monitor'' violations, thereby imposing an enforcement burden on the States.

Based on further consideration of the potential additional burden on both the PWSs and the States, EPA has determined that the provision in the 1989 TCR will stay as is: ''Systems are encouraged but not required to hold samples below 10 deg. C during transit.''

Finally, in this final rule, there have been some further changes to the analytical methods table to improve its clarity. Such changes include the addition of the approved online versions of Standard Methods in the analytical methods table and correction of some clerical errors.

J. Systems Under EPA Direct Implementation

Systems falling under direct oversight of EPA (e.g., Tribal systems, PWSs in Wyoming, and PWSs in States that have not yet obtained primacy for the RTCR) where EPA acts as the State, must comply with decisions made by EPA for implementation of the RTCR. Under § 142.16(q), to obtain primacy for the RTCR, States/Tribes are required to demonstrate how they intend to implement the various requirements of the rule; States/Tribes may do so in a manner that maximizes the efficiency of the rule for the States/Tribes and the PWSs while maintaining or increasing the effectiveness of the rule to protect public health. EPA has the same responsibilities when the Agency acts as the State in directly implementing the RTCR. In the proposed RTCR, EPA requested comment on whether to make this explicit in the final RTCR. All commenters who responded to this request for comment were in support of such action. EPA already has such authority or flexibility in direct implementation situations, both in the 1989 TCR and in all other NPDWRs, but solicited comment and has added this provision to the final rule for the sake of clarity in situations where EPA directly implements the RTCR.

K. Compliance Date

Consistent with SDWA section 1412(b)(10), States and PWSs are given three years after the promulgation of the RTCR to prepare for compliance with the rule. PWSs must begin compliance with the requirements of the RTCR on April 1, 2016, a compliance effective date that is just over three years from promulgation and coincides with quarterly monitoring schedules applicable to many water systems. EPA believes that capital improvements generally are not necessary to ensure compliance with the RTCR. However, a State may allow individual systems up to two additional years to comply with the RTCR if the State determines that additional time is necessary for capital improvements, in accordance with SDWA section 1412(b)(10).

IV. Other Elements of the Revised Total Coliform Rule

A. Best Available Technology

1. Requirements

EPA is making three modifications to the 1989 TCR provisions regarding the best technology, treatment techniques, or other means available for achieving compliance with the MCL for *E. coli* under the RTCR. EPA has re-designated these provisions from 40 CFR 141.63(d) to 141.63(e) and is making the following modifications.

- ''Coliforms'' in 40 CFR 141.63(d)(1) under the 1989 TCR is replaced with ''fecal contaminants'' in 40 CFR 141.63(e)(1).
- ''Cross connection control'' is added to the list of proper maintenance practices for the distribution system in 40 CFR 141.63(e)(3) (formerly 40 CFR 141.63(d)(3)).
- Subparts P, T, and W (filtration and/or disinfection of surface water), and subpart S (disinfection of ground water), are added in 40 CFR 141.63(e)(4) (formerly 40 CFR 141.63(d)(4)).

The Agency is listing the same technology, treatment techniques, or other means available for achieving compliance with the MCL for *E. coli* as provided in § 141.63(e), for small PWSs serving 10,000 or fewer people, as required by SDWA section 1412(b)(4)(E)(ii).

2. Key Issues Raised

EPA received comments that supported the modifications to the list of best available technologies (BATs). The Agency also received comments suggesting the addition of other items to the list, such as the optional barriers that may qualify systems for reduced monitoring, unidirectional flushing, storage tank inspection, maintenance, and cleaning, and re-pressurization. EPA heard from a few commenters who are against the inclusion of cross connection control in the list of BATs. They stated that it is not appropriate to do so because EPA has not defined cross connection control, and risks associated with cross connection and backflow are being addressed in the research efforts of the Research and Information Collection Partnership (see *http://water.epa.gov/lawsregs/rulesregs/sdwa/tcr/regulation_revisions_tcrdsac.cfm#ricp* for additional information about the Partnership); hence, they concluded it is premature to include it in the RTCR.

The methods for achieving compliance listed in 40 CFR 141.63(e) represent the technology, treatment technique, and other means which EPA finds to be feasible for purposes of meeting the MCL for *E. coli,* in accordance with section 1412(b)(4)(E) of SDWA. The RTCR however, is not imposing additional requirements (e.g., disinfection, filtration, etc.) beyond those already addressed by other microbial drinking water regulations such as the Ground Water Rule and the Surface Water Treatment Rules; nor is it imposing specific requirements regarding the use of the other methods such as main flushing programs, cross connection control, etc. PWSs are given the discretion to use the methods in 40 CFR 141.63(e) (if they are not already required to do so), or other methods of their choice (provided they are acceptable to the State), as they see fit for their own systems.

EPA believes that the inclusion of cross connection control to the list of BATs is appropriate given the public health risk associated with unprotected cross connection. Several States already require that PWSs implement a cross connection control program. As

discussed in the previous paragraph, the inclusion of cross connection control in 40 CFR 141.63(e) does not impose specific requirements on PWSs to implement a cross connection control program. Rather, it acknowledges that cross connection control can be one of the tools PWSs can use to comply with the *E. coli* MCL.

B. Variances and Exemptions

1. Requirements

EPA is not allowing variances or exemptions to the *E. coli* MCL in § 141.4(a). EPA believes that water that exceeds the MCL for *E. coli* poses an unreasonable risk to public health. Therefore, EPA is not allowing any variances or exemptions to the *E. coli* MCL. EPA is also eliminating the variance provisions in § 141.4(b) under the 1989 TCR that allow systems to demonstrate to the State that the violation of the monthly/non-acute total coliform MCL is due to biofilm and not fecal or pathogenic contamination. This change also results in a parallel change in § 142.63(b). Since the MCL for total coliforms is eliminated and replaced by a treatment technique, the variance for the presence of biofilms is no longer applicable and allowed under SDWA. Instead, the presence of biofilm is addressed through the assessment and corrective action requirements of the RTCR.

EPA is adding a note to the provision in § 141.4(a) to clarify that small system variances or exemptions for treatment technique requirements in this rule and other rules that control microbial contaminants may not be granted under SDWA section 1415(e)(6)(B) and § 142.304(a). This action reflects the statutory provision within EPA's regulations and adds no new requirements or limitations to any of these rules.

2. Key Issues Raised

Most commenters support these changes. However, EPA also received comment that supported the retention of the variance for the presence of biofilms. The commenter said that the retention of the biofilm variance would require PWSs to have a biofilm control program in place that will require ongoing assessment and research to determine and address the cause of the biofilms, thereby providing valuable information. Some commenters suggested that if the biofilm variance is removed, EPA should make it clear that the finding of biofilms as the cause of the positive sample during an assessment is not a sanitary defect which requires correction.

As discussed previously in section IV.B.1 of this preamble, *Requirements,* EPA is not allowing variances to the *E. coli* MCL because EPA believes that water which exceeds the MCL for *E. coli* poses an unreasonable risk to public health. Furthermore, retention of the variance for total coliforms is not allowed under SDWA because the MCL for total coliforms is eliminated and replaced by a treatment technique. EPA believes that additional research and information collection will be valuable to learning about the magnitude of the risks from biofilms. However, research available to date indicates that biofilms can harbor pathogens and result in accumulation of contaminants (Brown and Barker 1999; Szewzyk *et al.* 2000; Berry *et al.* 2006; Långmark *et al.* 2007), and considering it a sanitary defect is warranted in some cases. Also, persistent biofilms that cause continued total coliform presence compromises the value of total coliforms as an indicator of potential pathways of contamination. If biofilm is determined to be the cause of the total coliform-positive samples that triggered an assessment, the PWS is encouraged to work with the State to determine the right course of action to address the biofilms. Under the RTCR, States have the discretion to determine if the completed assessment and corrective action are adequate. The State can use this discretion in addressing instances of biofilm presence and determining the extent of biofilm problems in the distribution system and the need to address them. When a system has an ongoing biofilm problem that continues to cause total coliform-positive samples, the system and the State can continue to take action until the biofilm problem is resolved.

C. Revisions to Other NPDWRs as a Result of the RTCR

EPA recognizes that there are linkages among monitoring requirements between the 1989 TCR and other NPDWRs. For instance, under the Surface Water Treatment Rule (SWTR) (USEPA 1989b, 54 FR 27486, June 29, 1989) and the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) (USEPA 1998a, 63 FR 69389, December 16, 1998), the residual disinfectant monitoring must be conducted at the same time and location at which total coliform samples are taken, as required. Under the SWTR, high measurements of turbidity in an unfiltered subpart H system (i.e., a system using surface water or ground water under the influence of surface water) trigger additional total coliform samples; and compliance with the total coliform MCL under the 1989 TCR is one of the criteria for a PWS to avoid filtration. Under the GWR, 1989 TCR distribution system monitoring results determine whether a system is required to conduct source water monitoring.

For the criteria for avoiding filtration in the SWTR (§ 141.71(b)(5)), the Agency is clarifying that unfiltered systems must continue to meet the *E. coli* MCL promulgated with the final RTCR at § 141.63(c) in order to remain unfiltered. The changes to § 141.71(b)(5) provides for replacement of the (acute) total coliform MCL at § 141.63(b) with the *E. coli* MCL at § 141.63(c) at the compliance date of the RTCR. Although the name of the MCL has changed, the determination of the *E. coli* MCL remains basically the same as that for the (acute) total coliform MCL in § 141.63(c), with the only changes being those that were made to address the advisory committee recommendations and the public comments.

After considering other possible linkages between the RTCR and the SWTR, GWR, Stage 1 DBPR, Stage 2 DBPR (USEPA 2006e, 71 FR 388, January 4, 2006), and Airline Drinking Water Rule (USEPA 2009), EPA has concluded that the only other necessary revision to these NPDWRs is to update the references to the 1989 TCR at 40 CFR 141.21, which is superseded by 40 CFR part 141 subpart Y beginning April 1, 2016. The monitoring requirements themselves are not changing as a result of the RTCR. Residual disinfectant samples must still be taken at the same time and location at which total coliform samples are taken under the RTCR. High measurements of turbidity under the SWTR would still result in additional total coliform samples. Results of total coliform monitoring under the RTCR would still be a trigger for the GWR. Although there are changes to the dual-purpose sampling requirement (i.e., one sample to satisfy both the repeat monitoring requirement of the RTCR and the triggered source water monitoring requirement of the GWR), these changes are addressed in the RTCR and not in the GWR (see section III.D of this preamble, *Repeat Samples,* for further discussion on dual-purpose sampling). Comments received on dual-purpose sampling are also discussed in section III.D of this preamble, *Repeat Samples*.

EPA also received comments regarding the relationship between source water evaluations under the GWR and assessments under RTCR; those comments are addressed in section III.E.2 of this preamble, *Assessment*.

The RTCR is also not changing the existing sanitary survey requirements

established under the IESWTR and the GWR. However, the RTCR is adding the special monitoring evaluation that States must conduct at systems serving 1,000 or fewer people during the sanitary survey. These evaluations are not expected to significantly increase the burden to conduct sanitary surveys because of the relatively simple nature of these systems and their monitoring requirements.

EPA did not receive any other substantial comments regarding the relationships between RTCR and other NPDWRs.

EPA recognizes that there are sections of part 141 that will no longer be applicable after the RTCR compliance effective date. EPA intends to review and update these sections in the future.

D. Storage Facility Inspection

In the proposed RTCR, EPA discussed the potential public health implications associated with poorly maintained storage facilities (such as those associated with significant sediment accumulation inside the tank and the presence of breaches). EPA requested comment and supporting information regarding the current status of storage tanks and their inspection as implemented by individual States and PWSs. Some of the information EPA requested comment on included the state and condition of tanks that have been cleaned and inspected, costs of storage tank inspection and cleaning, the frequency of inspection and cleaning, and how public health can be better protected. Based on the comments and information that EPA received, the Agency is considering the need for inspection requirements for finished water storage facilities that would help mitigate potential public health risks if PWSs do not inspect their storage facilities as recommended by industry guidance (e.g., American Water Works Association (AWWA) Manual 42). EPA plans to provide further information on the results of its consideration of this issue in a future notice.

V. State Implementation

SDWA establishes requirements that States or eligible Indian Tribes must meet to assume and maintain primary enforcement responsibility (primacy) to implement national primary drinking water regulations. This section describes the requirements that States must meet to maintain primacy under the RTCR, including adoption of drinking water regulations that are no less stringent than the RTCR and meeting recordkeeping and reporting requirements. This section also provides an update on the Safe Drinking Water Information System (SDWIS) revisions that EPA is developing to facilitate the implementation of RTCR.

A. Primacy

1. Requirements

States are required to adopt or maintain requirements that are at least as stringent as all of the sections of 41 CFR part 141that are revised or added by the RTCR. SDWA provides two years after promulgation of the RTCR (plus up to two more years if the Administrator approves) for the State to adopt their regulations. States may adopt more stringent requirements (e.g., requiring all systems to conduct routine monthly monitoring). Many States have used this authority in the past to improve public health protection and/or simplify implementation.

EPA grants interim primary enforcement authority for a new or revised regulation during the period in which EPA is making a determination with regard to primacy for that new or revised regulation. States that have primacy (including interim primacy) for every existing NPDWR already in effect may obtain interim primacy for the RTCR, beginning on the date that the State submits the application for this rule to EPA, or the effective date of its revised regulations, whichever is later. A State that wishes to obtain interim primacy for future NPDWRs must obtain primacy for this rule.

EPA regulations at 40 CFR part 142 contain the program implementation requirements for States to obtain primacy for the public water supply supervision program as authorized under SDWA section 1413. In addition to adopting rule requirements that are at least as stringent as the requirements of the RTCR, and basic primacy requirements specified in 40 CFR part 142, States are required to adopt special primacy provisions pertaining to each specific regulation where State implementation of the rule involves activities beyond general primacy provisions. States must include these regulation-specific provisions in their application for approval of any program revision. States must also continue to meet all other conditions of primacy for all other rules in 40 CFR part 142.

The RTCR provides States with flexibility to implement the requirements of the rule in a manner that maximizes the efficiency of the rule for the States and water systems while increasing the effectiveness of the rule to protect public health. To ensure an effective and enforceable program under the RTCR, the State primacy application for RTCR must include a description of how the State will meet the following special primacy provisions contained in the RTCR at 40 CFR part 142:

- Baseline and Reduced Monitoring Provisions—The State primacy application must indicate what baseline and reduced monitoring provisions of the RTCR the State will adopt and describe how the State will implement the RTCR in these areas so that EPA can be assured that implementation plans meet the minimum requirements of the rule.
- Sample Siting Plans—States must describe the frequency and process used to review and revise sample siting plans in accordance with 40 CFR part 141, subpart Y to determine adequacy.
- Reduced Monitoring Criteria—The primacy application must indicate whether the State will adopt the reduced monitoring provisions of the RTCR (e.g., reduced monitoring provisions for ground water systems serving 1,000 or fewer people, including provisions on dual purpose sampling). If the State adopts the reduced monitoring provisions, it must describe the specific types or categories of water systems that will be covered by reduced monitoring and whether the State will use all or a reduced set of the optional criteria. For each of the reduced monitoring criteria, both mandatory and optional, the State must describe how the criteria will be evaluated to determine when systems qualify.
- Assessments and Corrective Actions—States must describe their process to implement the new assessment and corrective action phase of the rule. The description must include how the State will ensure that Level 2 assessments are more comprehensive than Level 1 assessments, examples of sanitary defects, examples of assessment forms or formats, and methods that systems may use to consult with the State on appropriate corrective actions.
- Invalidation of routine and repeat samples collected under the RTCR—States must describe their criteria and process to invalidate total coliform-positive and *E. coli*-positive samples under the RTCR. This includes criteria to determine if a sample was improperly processed by the laboratory, reflects a domestic or other non-distribution system plumbing problem or reflects circumstances or conditions that do not reflect water quality in the distribution system.
- Approval of individuals allowed to conduct RTCR Level 2 assessments—States must describe their criteria and process for approval of individuals allowed to conduct RTCR Level 2 assessments.

• Special monitoring evaluation—States must describe how they will perform special monitoring evaluations during sanitary surveys for ground water systems serving 1,000 or fewer people to determine whether systems are on an appropriate monitoring schedule.

• Seasonal systems—States must describe how they will identify seasonal systems, how they will determine when systems on less than monthly monitoring must monitor, and what will be the seasonal system start-up provisions.

• Additional criteria for reduced monitoring—States must describe how they will require systems on reduced monitoring to demonstrate, where appropriate:

—Continuous disinfection entering the distribution system and a residual in the distribution system.
—Cross connection control.
—Other enhancements to water system barriers.

• Criteria for extending the 24-hour period for collecting repeat samples—If the State elects to use a set of criteria in lieu of case-by-case decisions, they must describe the criteria they will use to waive the 24-hour time limit for collecting repeat samples after a total coliform-positive routine sample, or to extend the 24-hour limit for collection of samples following invalidation. If the State elects to use only case-by-case waivers, the State does not need to develop and submit criteria.

2. Key Issues Raised

Commenters generally supported the inclusion of these activities in the primacy application and emphasized the importance of the flexibility and discretion that this approach provides for States to build on existing authorities of the 1989 TCR and focus on systems with the greatest need. They suggested that EPA allow States as much flexibility and discretion as possible to design their approach to implementing the RTCR, including how to address seasonal water systems, qualifications of assessors, the content of sample siting plans, and compliance with multiple rules (e.g., coordination between 1989 TCR/RTCR and GWR compliance), and how to consider multiple Level 1 assessments where the cause of the first Level 1 assessment has been identified and corrected. However, some commenters suggested removal of some of the special primacy requirements, such as those regarding seasonal system startup procedures and how the States will review sample siting plans, implement the assessment and corrective action phase, and determine who is approved to conduct Level 2 assessments. EPA is maintaining these primacy requirements in the RTCR because they provide the States with the flexibility to design their programs to fit their own needs without prescriptive, one-size-fits-all requirements. Describing how the State will accomplish them in the primacy application assures that consumers nationwide are receiving adequate and comparable public health protection under the rule.

EPA also requested comment on whether it is appropriate to have States describe their criteria for waiving or extending the 24-hour limit to collect repeat samples as a special primacy condition, or instead have States keep records of decisions to waive and/or extend the 24-hour limit. The majority of the commenters supported the former option as it reduces paperwork burden and adds flexibility to the implementation of the RTCR. EPA concurs and added the waiver or extension of the 24-hour limit to the special primacy requirements as an option for States that would rather describe their criteria for waiving or extending the 24-hour limit in their primacy application, instead of having to make the decision on a case-by-case basis. States that elect to use only case-by-case waivers do not need to develop and submit criteria.

B. State Recordkeeping and Reporting and SDWIS

1. Recordkeeping

The current regulations in 40 CFR 142.14 require States with primacy to keep records, including: analytical results to determine compliance with MCLs, maximum residual disinfectant levels (MRDLs), and treatment technique requirements; PWS inventories; State approvals; enforcement actions; and the issuance of variances and exemptions. Consistent with the recordkeeping requirements of the current regulations, the RTCR requires States to keep records and supporting information for each of the following decisions or activities for five years:

• Any case-by-case decision to waive the 24-hour time limit for collecting repeat samples after a total coliform-positive routine sample, or to extend the 24-hour limit for collection of samples following invalidation.

• Any decision to allow a system to waive the requirement for three routine samples the month following a total coliform-positive sample. The record of the waiver decision must contain all the items listed in §§ 141.854(j) and 141.855(f) of the RTCR.

• Any decision to invalidate a total coliform-positive sample. If the State decides to invalidate a total coliform-positive sample as provided in § 141.853(c)(1) of the RTCR, the record of the decision must contain all the items listed in that paragraph.

Also, consistent with the recordkeeping requirements of the current regulations, under the RTCR States must retain records of each of the following decisions in such a manner that each system's current status may be determined at any time:

• Any decision to reduce the total coliform monitoring frequency for a community water system serving 1,000 or fewer people to less than once per month, as provided in § 141.855(d) of the RTCR; and what the reduced monitoring frequency is. A copy of the reduced monitoring frequency must be provided to the system.

• Any decision to reduce the total coliform monitoring frequency for a non-community water system using only ground water and serving 1,000 or fewer people to less than once per quarter, as provided in § 141.854(e) of the RTCR, and what the reduced monitoring frequency is. A copy of the reduced monitoring frequency must be provided to the system.

• Any decision to reduce the total coliform monitoring frequency for a non-community water system using only ground water and serving more than 1,000 persons during any month the system serves 1,000 or fewer people, as provided in § 141.857(d) of the RTCR. A copy of the reduced monitoring frequency must be provided to the system.

• Any decision to waive the 24-hour limit for taking a total coliform sample for a public water system that uses surface water, or ground water under the direct influence of surface water, and that does not practice filtration in accordance with part 141, subparts H, P, T, and W, and that measures a source water turbidity level exceeding 1 nephelometric turbidity unit (NTU) near the first service connection.

• Any decision to allow a public water system to forgo *E. coli* testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is *E. coli*-positive.

The RTCR also adds the following new recordkeeping requirement:

• States must keep records and supporting information regarding completed and approved RTCR assessments, including reports from the system that corrective action has been completed, for five years.

2. Reporting

EPA currently requires at 40 CFR 142.15 that States report to EPA information such as violations, variance and exemption status, and enforcement actions. The RTCR requires States to develop and maintain a list of public water systems that the State is allowing to monitor less frequently than once per month for community water systems or less frequently than once per quarter for non-community water systems, including the compliance date (the date that reduced monitoring was approved) of the reduced monitoring requirement for each system.

3. SDWIS

EPA has begun to plan and develop the next version of SDWIS, SDWIS Next Gen, which will provide improved capabilities to update the system when there are new rule requirements and that enables more efficient data sharing among systems, laboratories, States, and EPA. EPA has established a governance structure to allow States to provide input on SDWIS Next Gen and begin identifying and prioritizing necessary system functions. Developing the portions of the system that are needed for implementing RTCR is a high priority. EPA remains committed to completing revisions to SDWIS that will facilitate implementation of RTCR and to completing them well in advance of the effective date of the rule.

4. Key Issues Raised

Many commenters emphasized the importance of developing revisions to SDWIS sufficiently in advance of the effective date of the rule to allow for efficient, effective, and consistent implementation, tracking, recordkeeping, and reporting. As indicated above, EPA has already begun planning and development of SDWIS Next Gen to incorporate changes necessary to implement RTCR. EPA plans to complete the revisions necessary to implement RTCR well in advance of the RTCR effective date. Commenters also noted the advisory committee recommendation to develop metrics for evaluating the effectiveness of RTCR. Identifying metrics and incorporating them into SDWIS Next Gen will be part of the process completed by the governance structure with the input of stakeholders.

Some commenters objected to the requirement for States to maintain lists of systems on reduced monitoring and information on decisions on sample invalidations and waivers of time limits. EPA notes that these requirements also existed under the 1989 TCR and are not new under the RTCR. These requirements, and the requirements to maintain other information such as regarding assessments and review of seasonal system startup procedures, will be considered in the design of SDWIS Next Gen and incorporated to the extent possible to help States efficiently manage their implementation requirements.

Commenters also expressed the need for guidance to help States implement rule requirements regarding annual site visits for systems on annual monitoring, review of system RTCR monitoring frequency during sanitary surveys, review of seasonal system startup procedures, and identification of qualified assessors for Level 2 assessments. EPA plans to work with States to develop the necessary changes in implementation guidance well before the effective date of the RTCR.

VI. Economic Analysis (Health Risk Reduction and Cost Analysis)

This section summarizes the economic analysis (EA) for the final RTCR. The EA is an assessment of the benefits, both health and non-health-related, and costs to the regulated community of the final regulation, along with those of regulatory alternatives that the Agency considered. EPA developed the EA for the RTCR to meet the requirement of SDWA section 1412(b)(3)(C) for a Health Risk Reduction and Cost Analysis (HRRCA), as well as the requirements of Executive Order 12866, Regulatory Planning and Review, and Executive Order 13563, Improving Regulation and Regulatory Review, under which EPA must estimate the costs and benefits of the rule. The full EA for the final RTCR (RTCR EA) (USEPA 2012a) includes additional details and discussion on the topics presented throughout this section of the preamble. It is available in the docket (Docket ID No. EPA–HQ–OW–2008–0878) and is also published on the government's Web site at *http://www.regulations.gov*.

SDWA section 1412(b)(3)(C) requires that the HRRCA for a NPDWR take into account the following seven elements: (1) Quantifiable and nonquantifiable health risk reduction benefits; (2) quantifiable and nonquantifiable health risk reduction benefits from reductions in co-occurring contaminants; (3) quantifiable and nonquantifiable costs that are likely to occur solely as a result of compliance; (4) incremental costs and benefits of rule options; (5) effects of the contaminant on the general population and sensitive subpopulations including infants, children, pregnant women, elderly, and individuals with a history of serious illness; (6) any increased health risks that may occur as a result of compliance, including risks associated with co-occurring contaminants; and (7) other relevant factors such as uncertainties in the analysis and factors with respect to the degree and nature of risk. A summary of these elements is provided in this section of the preamble, and a complete discussion can be found in the RTCR EA.

Both benefit and cost measures are adjusted using social discounting. In social discounting, future values of a rule's or policy's effects are multiplied by discount factors. The discount factors reflect both the amount of time between the present and the point at which these events occur and the degree to which current consumption is more highly valued than future consumption (USEPA 2000a). This process allows comparison of cost and benefit streams that are variable over a given time period. EPA uses social discount rates of both three percent and seven percent to calculate present values from the stream of benefits and costs and also to annualize the present value estimates. Historically, the use of three percent is based on after tax rates of return to consumers on relatively risk-free financial instruments, while seven percent is an estimate of average economy-wide before-tax rate of return to incremental private investment generally. For further information, see USEPA 2000a and OMB 1996.

The time frame used for both benefit and cost comparisons in this rule is 25 years. This time interval accounts for rule implementation activities occurring soon after promulgation (e.g., States adopting the criteria of the regulation) and the time for different types of compliance actions (e.g., assessments and corrective actions) to be realized up through the 25th year following rule promulgation. In the RTCR EA, EPA also presents the undiscounted stream of benefits and costs over the 25-year time frame in constant 2007 dollars (2007$).

The benefits described in this section are discussed qualitatively, and reductions in occurrence of total coliforms and *E. coli* and in Level 2 assessments are used as indicators of positive benefits. EPA was unable to quantify health benefits for the RTCR because there are insufficient data reporting the co-occurrence in a single sample of fecal indicator *E. coli* and pathogenic organisms. In addition, the available fecal indicator *E. coli* data from the Six-Year Review 2 dataset (USEPA 2012a) described in this preamble were limited to presence-

absence data because the 1989 TCR requires only the reporting of presence or absence of fecal indicator *E. coli* using EPA-approved standard methods. However, as discussed in chapter 6 of the RTCR EA, even though health benefits could not be directly quantified, the potential benefits from the RTCR include avoidance of a full range of health effects from the consumption of fecally contaminated drinking water, including the following: acute and chronic illness, endemic and epidemic disease, waterborne disease outbreaks, and death. Since fecal contamination may contain waterborne pathogens including bacteria, viruses, and parasitic protozoa, in general, a reduction in fecal contamination should reduce the risk from all of these contaminants.

The net costs of the rule stem mostly from the new assessment and corrective action requirements as well as the revised monitoring provisions described earlier in this preamble. The costs discussed in this section are presented as annualized present values in constant 2007$.

This section of the preamble includes elements as follows: (A) Regulatory Options Considered, (B) Major Sources of Data and Information Used in Supporting Analyses, (C) Occurrence and Predictive Modeling, (D) Baseline Profiles, (E) Anticipated Benefits of the RTCR, (F) Anticipated Costs of the RTCR, (G) Potential Impact of the RTCR on Households, (H) Incremental Costs and Benefits, (I) Benefits from Simultaneous Reduction of Co-occurring Contaminants, (J) Change in Risk from Other Contaminants, (K) Effects of Fecal Contamination and/or Waterborne Pathogens on the General Population and Sensitive Subpopulations, (L) Uncertainties in the Benefit and Cost Estimates for the RTCR, (M) Benefit Cost Determination for the RTCR, (N) Comments Received in Response to EPA's Requests for Comment, and (O) Other Comments Received by EPA.

A. Regulatory Options Considered

EPA evaluated the following three regulatory options as part of this revised rule: (1) The 1989 TCR option, (2) the RTCR option (today's final rule), and (3) an Alternative option. EPA discusses the three regulatory options briefly in this preamble and in greater detail in chapter 3 of the RTCR EA.

First, the 1989 TCR option reflects EPA's understanding of how the 1989 TCR is currently being implemented. That is, the 1989 TCR option is assumed to include ''status quo'' PWS and State implementation practices. Next, the RTCR option is based on the provisions of this final rule as described in detail in section III of this preamble, *Requirements of the Revised Total Coliform Rule.* Third, the Alternative option parallels the RTCR in most ways but includes variations of some of the provisions that were discussed by the advisory committee before they reached consensus on the recommendations in their AIP, which served as the basis for the proposed and final rules.

The Alternative option differs from the RTCR option in two ways. First, under the Alternative option, at the compliance date all PWSs are required to sample monthly for an initial period until they meet the eligibility criteria for reduced monitoring. EPA assumes that eligibility for reduced monitoring is determined during the next sanitary survey following the RTCR compliance date. This more stringent approach differs from the RTCR option that allows PWSs to continue to monitor at their current frequencies (with an additional annual site visit or voluntary Level 2 assessment requirement for PWSs wishing to remain on annual monitoring) until they are triggered into an increased sampling frequency. Second, under the Alternative option, no PWSs are allowed to reduce monitoring to an annual basis. EPA defined the Alternative option this way and included it in the RTCR EA to assess the relative impacts of a more stringent rule and to better understand the balance between costs and public health protection. EPA wishes to emphasize that it is not adopting the Alternative Option, but is providing cost and benefit information on it as a point of comparison with the final rule as promulgated.

To understand the relative impacts of the options, EPA gathered available data and information to develop and provide input into an occurrence and predictive model. EPA estimated both baseline conditions and changes to these conditions anticipated to occur over time as a result of these revised rule options. The analysis is described in more detail in the RTCR EA.

B. Major Sources of Data and Information Used in Supporting Analyses

This section of the preamble briefly discusses the data sources that EPA used in its supporting analyses for the RTCR. For a more detailed discussion, see chapter 4 of the RTCR EA.

1. Safe Drinking Water Information System Federal Version Data

Safe Drinking Water Information System Federal Version (SDWIS/FED) is EPA's national regulatory compliance database for the drinking water program and is the main source of PWS inventory and violation data for the RTCR baseline. SDWIS/FED contains information on each of the approximately 155,000 active PWSs as reported by primacy agencies, EPA Regions, and EPA headquarters personnel. SDWIS/FED includes records of MCL violations and monitoring and reporting violations (both routine and repeat and minor and major). It does not include sample results. It also contains information to characterize the US inventory of PWSs including system name and location, retail population served, source water type (ground water (GW), surface water (SW), or ground water under the direct influence of surface water (GWUDI)), disinfection status, and PWS type (community water system (CWS), transient non-community water system (TNCWS), and non-transient non-community water system (NTNCWS)).

To create the PWS and population baseline, EPA used the fourth quarter of SDWIS/FED 2007 (USEPA 2007b), which was the most current PWS inventory data available when EPA began developing the RTCR EA. These data represent all current, active PWSs and the population served by these systems.

EPA also used the MCL violation data from SDWIS/FED to validate model predictions for systems serving 4,100 or fewer people and to predict *E. coli* (or ''acute,'' under the 1989 TCR) MCL violations (1989 TCR, RTCR, and Alternative option), total coliform (non-acute or monthly) MCL violations (1989 TCR), and Level 1 and Level 2 assessment triggers (RTCR and Alternative option) for systems serving more than 4,100 people.

2. Six-Year Review 2 Data

Through an Information Collection Request (ICR) (USEPA 2006b), States voluntarily submitted electronically available 1989 TCR monitoring data [1] (sample results) that were collected between January 1998 and December 2005. EPA requested the 1989 TCR monitoring results with the intent of conducting analyses and developing models to assess the potential impacts of changes to the 1989 TCR. EPA received data from 46 States, Tribes, and territories. A Data Quality Report (USEPA 2010c) describes how the 1989 TCR monitoring data were obtained, evaluated, and modified where

[1] This refers to results of monitoring conducted pursuant to the 1989 TCR, not results from the year 1989.

necessary to make the database internally consistent and usable for analysis. Exhibit 2.1 in the Data Quality Report provides a complete list of States or territories that submitted data and a description of the use of these data.

In this EA, EPA included data from 37 primacy agencies (35 States and 2 Tribes). Records included data for:

- PWS information (system type, population served, source water type)
- Sample type (routine, repeat, special purpose)
- Analytical result
- Sampling location—entry point, distribution system and, for repeat samples, original location, downstream, upstream, and other
- Analytical method
- Disinfectant residual data collected at TCR monitoring sites

As discussed in greater detail in section 4.2.2.1 of the RTCR EA, EPA used 2005 data exclusively in the analyses supporting the RTCR because the 2005 data set was the most complete year of data among the Six-Year Review 2 data. The 2005 data was also the most recent data available suggesting that it may be the most representative of present conditions.

The Six-Year Review 2 data also informed EPA's assumptions regarding the proportions of ground water systems serving 1,000 or fewer people that sample monthly, quarterly, or annually.

3. Other Information Sources

Additional data and information sources included the Economic Analysis for the Ground Water Rule (GWR EA) (USEPA 2006a), the *Technology and Cost Document for the Revised Total Coliform Rule* (RTCR T&C document) (USEPA 2012b), the US Census data, and the knowledge and experience of stakeholders representing industry, States, small systems, and the public.

The GWR EA provided occurrence information on *E. coli* in the source water of ground water PWSs for modeling the triggered monitoring component of GWR and informed the assumptions on the distribution of corrective actions taken in response to the presence of *E. coli* in the source water. As discussed in section VI.C of this preamble, *Occurrence and Predictive Modeling,* the model developed for this economic analysis considers the effect of GWR both before and during implementation of the RTCR. The RTCR T&C document included estimates of unit costs for the major components of the RTCR that were obtained from the advisory committee technical workgroup and vendors, including labor, monitoring, assessments, and corrective actions.

US Census data were used to estimate population per household and to characterize sensitive subpopulations. Lastly, knowledge and experience from stakeholders helped to inform the assumptions that were made for the analysis.

A more detailed discussion of these data sources and how EPA used them are included in the RTCR EA.

C. Occurrence and Predictive Modeling

EPA used the data to develop an occurrence and predictive model for PWSs serving 4,100 or fewer people based primarily on the 2005 Six-Year Review 2 data. The model predicts changes in total coliform and *E. coli* occurrence, Level 1 and Level 2 assessments (based on simulated monitoring results), corrective actions, and violations over time. EPA developed another simpler predictive model for PWSs serving more than 4,100 people that predicts Level 1 and Level 2 assessments (based on 2005 violation data from SDWIS/FED), corrective actions, and violations over time, but not total coliform and *E. coli* occurrence. EPA modeled systems serving more than 4,100 people separately because the Six-Year Review 2 data for larger PWSs were not as robust as the data for the smaller systems. In addition, while the RTCR includes new monitoring requirements for PWSs serving 4,100 people or fewer, monitoring requirements for systems serving greater than 4,100 people remain essentially unchanged from the 1989 TCR. This section briefly discusses the structures of each of the two models and how they used available data, information, and assumptions to make predictions over time resulting from the regulatory options.

Chapter 5 of the RTCR EA includes a more detailed description of the occurrence and predictive model used for PWSs serving 4,100 or fewer people, and the other simpler predictive model used for PWSs serving greater than 4,100 people.

1. Model Used for PWSs Serving ≤ 4,100 People

The occurrence and predictive model used for PWSs serving 4,100 or fewer people has two components. The first component of the model characterized how the presence or positive rates of total coliform and *E. coli* detections vary across the population of small (serving 4,100 or fewer people) public water systems in the US. These rates vary by the type of sample (routine or repeat), by analyte (total coliforms or *E. coli*), and by system type (CWS, NCWS, or TNCWS) and size. The second component of the model used the total coliform and *E. coli* occurrence distributions to simulate a set of nationally-representative systems within the context of the three regulatory options (1989 TCR, RTCR, and Alternative) to predict changes in total coliform and *E. coli* occurrence, triggers, assessments, corrective actions over time, and violations.

The model assumed that the national occurrence of total coliforms and *E. coli* has reached a steady state in recent years under the 1989 TCR. It assumed that cycles of normal deterioration and repair/replacement are occurring at the individual system level, but the numbers of violations at the national level have remained relatively unchanged. This assumption is based on evaluation of SDWIS/FED violation data. Exhibit VI–1 presents the number of PWSs with violations from 2001–2007 under the 1989 TCR which shows that national violation rates have remained relatively steady over recent years. The RTCR will affect this steady state, likely resulting in a reduction of the underlying occurrence and associated violations.

EXHIBIT VI–1—NUMBER OF PWSS WITH VIOLATIONS BY SYSTEM TYPE (2001–2007)

PWS Type	Year						
	2001	2002	2003	2004	2005	2006	2007
Acute MCL Violations							
CWS	143	144	185	171	151	171	171
NTNCWS	51	53	70	58	65	68	45
TNCWS	261	278	322	351	349	361	295

EXHIBIT VI–1—NUMBER OF PWSS WITH VIOLATIONS BY SYSTEM TYPE (2001–2007)—Continued

PWS Type	Year						
	2001	2002	2003	2004	2005	2006	2007
All	455	475	577	580	565	600	511
Non-Acute MCL Violations							
CWS	2,074	2,110	2,204	2,314	2,196	2,095	1,996
NTNCWS	601	679	725	750	753	735	655
TNCWS	2,707	2,934	3,036	3,132	3,039	3,244	3,209
All	5,382	5,723	5,965	6,196	5,988	6,074	5,860

Note: PWSs counts are of systems that had at least one violation during the year.
Source: SDWIS/FED annual data for period ending 3rd quarter 2001–2007. OH, US territories, Tribal PWS data excluded.

Before the RTCR goes into effect, GWR implementation begins and is also expected to affect the steady state. To estimate the effects that GWR implementation is expected to have on present steady state conditions, EPA used the occurrence and predictive model to simulate five years of implementation of the 1989 TCR with the GWR, which became effective in December 2009. EPA assumed these five years to account for the approximately two years before the expected promulgation date of the final RTCR and an additional three years after that until the RTCR effective date. The assumptions made to account for the GWR are described in detail in the in the RTCR EA and summarized in Exhibit VI–2.

EXHIBIT VI–2—SUMMARY OF MAJOR ASSUMPTIONS FOR SIMULATING GWR IMPLEMENTATION

GWR provision	Modeling approach/assumption
Triggered Monitoring: Ground water systems not providing 4-log treatment for viruses that have total coliform-positive samples under the 1989 TCR are required to take source water samples and test for a fecal indicator. If the sample is positive, they must take an additional 5 source water samples (unless the State requires corrective action). If any of these is positive, they must conduct corrective action.	Current model used same probabilities used in GWR EA (USEPA 2006a) to predict whether source water samples will be *E. coli*-positive. Ground water systems required to conduct corrective action due to monitoring results will either install disinfection or implement a non-disinfecting corrective action as described in the RTCR EA. Ground water systems installing disinfection will draw from the probability distributions for total coliforms and *E. coli* for disinfected systems for the remainder of analysis. Ground water systems implementing a nondisinfecting corrective action will experience no positive samples for the remainder of the year plus two additional years and will experience a 75[1] percent reduction in occurrence for five additional years.
Sanitary Surveys: GWR includes Federal sanitary survey requirements for all ground water systems, and requires States to perform regular comprehensive sanitary surveys including eight critical elements.	Model did not explicitly simulate sanitary surveys or their results. Rather, it assumed that the new sanitary survey provisions will result in 10 percent[2] reduced occurrence of total coliforms universally for entire analysis.
Compliance Monitoring: Ground water systems that provide 4-log treatment for viruses must demonstrate that they are providing this level of treatment by conducting compliance monitoring.	Model did not explicitly simulate compliance monitoring. Rather, it assumed that the provision will result in 10 percent[3] reduced occurrence of total coliforms for those ground water systems that are conducting compliance monitoring once assumed 4-log treatment for viruses begins.

[1 2 3] Assumption reflects EPA best professional judgment.
Source: RTCR EA (USEPA 2012a) as informed by GWR EA (USEPA 2006a).

Actual reductions in occurrence from the implementation of GWR requirements may differ from what is presented here. However, based on assumptions used in this model, the analysis of how the RTCR and Alternative option perform relative to each other are not affected.

In addition to capturing the effect of implementation of GWR requirements with the 1989 TCR for a five-year period of analysis, the model captures an additional 25 years with the 1989 TCR, the RTCR option, and the Alternative option. Along with changes in total coliform and *E. coli* occurrence, the model predicts behavioral changes: the number of Level 1 and Level 2 assessments (and associated Level 1 or Level 2 corrective actions) to be performed, further resulting adjustments to occurrence, and changes in sampling regimens as systems qualify for reduced monitoring requirements. The assumptions used to simulate RTCR implementation are detailed in the RTCR EA and summarized in Exhibit VI–3.

EXHIBIT VI–3—SUMMARY OF MAJOR ASSUMPTIONS FOR SIMULATING RTCR IMPLEMENTATION

RTCR Provision	Modeling Approach/Assumption
Level 1 Assessment	Model simulates sampling and sampling results and determines which PWSs will be triggered to conduct an assessment. Sanitary defects are found in 10 percent[1] of assessments (represents net increase over the 1989 TCR). All sanitary defects are corrected. Model selects from distribution of potential corrective actions as explained in chapter 7 of the RTCR EA (USEPA 2012a). PWSs implementing a corrective action as a result of a Level 1 assessment experience no positive samples for the remainder of the year plus one additional year and will experience 50 percent[2] reduction in occurrence for three additional years.
Level 2 Assessment	Model simulates sampling and sampling results and determines which PWSs will be triggered to conduct an assessment. Sanitary defects will be found in 10 percent[3] of assessments (represents net increase over the 1989 TCR). All sanitary defects are corrected. Model selects from distribution of potential corrective actions as explained in chapter 7 of the RTCR EA (USEPA 2012a). PWSs implementing a corrective action as a result of a Level 2 assessment will experience no positive samples for the remainder of the year plus two additional years and will experience 75 percent[4] reduction in occurrence for five additional years.

[1 3] Assumption based on conversation with State representatives with on-the-ground experience.
[2 4] Assumption reflects EPA best professional judgment.
Note: EPA recognizes that there is a large uncertainty with the assumptions. Sensitivity analyses showed that the fundamental conclusions of the economic analysis do not change over a wide range of assumptions tested.
Source: RTCR EA (USEPA 2012a)

EPA made different assumptions for the effectiveness of assessments and subsequent corrective actions to account for the differences between the two types of assessments. The Level 2 assessment is a more comprehensive investigation that may result in finding more substantial problems than what may be found during a Level 1 assessment, and for that reason the corrective actions that result from a Level 2 assessment were modeled to result in corrective action measures that are generally more expensive and have bigger and longer lasting effects than those of the Level 1 assessments. EPA conducted sensitivity analyses around the key assumptions summarized in Exhibit VI–2 as discussed in section VI.L of this preamble, *Uncertainties in the Benefit and Cost Estimate for the RTCR.*

2. Model Used for PWSs Serving > 4,100 People

For systems serving more than 4,100 people, EPA estimated violation and trigger rates using SDWIS/FED because the Six-Year Review 2 data for PWSs serving more than 4,100 people were not as robust as the Six-Year Review 2 data for systems serving 4,100 or fewer people. EPA did not quantify changes in violation or trigger rates for systems serving more than 4,100 people among the 1989 TCR, RTCR, and Alternative options because of: (1) Limited Six-Year Review 2 data to characterize these systems, (2) the essentially unchanged monitoring requirements across options for these systems, and (3) the level of effort already occurring to implement the 1989 TCR.

D. Baseline Profiles

The estimate of baseline conditions that EPA developed provides a reference point for understanding net impacts of the RTCR.

Compliance with the GWR began in December 2009, and the expected compliance date of the RTCR is approximately six years following commencement of the GWR implementation. The majority of PWSs are ground water systems and these systems are expected to be affected by the GWR. Because GWR implementation prior to the effective date of RTCR is expected to cause changes to ground water systems, the baseline conditions that EPA developed for ground water systems account for the expected effects of the GWR.

For PWSs serving more than 4,100 people, EPA assumed that present conditions, as reflected in 2005 SDWIS/FED data, are an appropriate representation of the conditions that are likely to exist when the RTCR becomes effective. EPA assumed that a steady state exists at the national level.

The number of ground water PWSs that disinfect is expected to change during implementation of the GWR before the expected rule compliance date of the RTCR. Exhibit VI–4 shows the estimated baseline number of the ground water PWSs at the RTCR compliance date.

EXHIBIT VI–4—ESTIMATED BASELINE NUMBER OF GROUND WATER SYSTEMS AND DISINFECTION STATUS AT COMPLIANCE DATE (3 YEARS POST RTCR PROMULGATION)

PWS Size	Number of ground water PWSs (post-GWR)					
	CWS		NTNCWS		TNCWS	
	Disinfecting	Non-disinfecting	Disinfecting	Non-disinfecting	Disinfecting	Non-disinfecting
≤100	6,190	5,748	2,938	5,888	13,753	46,447
101–500	9,311	4,581	2,776	3,837	5,451	13,824
501–1,000	3,512	955	873	845	684	1,279
1,001–4,100	5,422	1,021	547	265	274	343
4,101–33,000	2,798	358	56	14	27	40
33,001–96,000	307	28	2			2
96,001–500,000	62	1				1
500,001–1 M	4					1
>1 M	3					

EXHIBIT VI–4—ESTIMATED BASELINE NUMBER OF GROUND WATER SYSTEMS AND DISINFECTION STATUS AT COMPLIANCE DATE (3 YEARS POST RTCR PROMULGATION)—Continued

PWS Size	Number of ground water PWSs (post-GWR)					
	CWS		NTNCWS		TNCWS	
	Disinfecting	Non-disinfecting	Disinfecting	Non-disinfecting	Disinfecting	Non-disinfecting
Total	27,610	12,691	7,191	10,850	20,189	61,937
Combined Total		40,301		18,041		82,126

Source: RTCR Occurrence and Predictive Model Output as detailed in the RTCR EA (USEPA 2012a)

EPA estimated the numbers of ground water PWSs that monitor monthly, quarterly, and annually under the 1989 TCR based on an analysis of the Six-Year Review 2 data and individual State statutes conducted by EPA and the advisory committee Technical Work Group (TWG). Of the ground water PWSs serving 1,000 or fewer people, EPA estimated that approximately 34,000 monitor monthly, 67,000 monitor quarterly, and 27,000 monitor annually. EPA assumed that the numbers of systems on monthly, quarterly, and annual monitoring remain unchanged at the rule effective date for a continuation of the 1989 TCR. For the RTCR option, EPA assumed that only the percentage of systems that received an annual site visit under the 1989 TCR would continue on annual monitoring under the RTCR; the percentage of systems that would therefore no longer qualify for annual monitoring under the RTCR were assumed to revert to baseline quarterly monitoring. Under the Alternative option, all PWSs, regardless of size or type, start at monthly monitoring at the rule effective date.

The following two tables provide an overview of summary statistics relating to baseline water quality. Exhibit VI–5 shows the percentage of total coliform- and *E. coli*-positive samples based on PWS type and size. The percentages of samples that are total coliform-positive are generally higher in ground water systems than in surface water systems; in smaller systems than in larger systems; and in NCWSs than in CWSs.

EXHIBIT VI–5—TOTAL COLIFORM AND E. COLI PERCENT POSITIVE BY SYSTEM SIZE AND TYPE

PWS Type	Source water	Population served	Total coliform (# samples)	Total coliform (+ samples)	Total coliform (% positive)	*E. coli* (# samples) [1]	*E. coli* (+ samples)	*E. coli* (% positive) [2]
CWS	Ground Water (GW)	≤100	93,105	2,479	2.66	1,172	72	0.08
		101–500	125,490	2,500	1.99	1,639	61	0.05
		501–1,000	48,265	736	1.52	483	20	0.04
		1,001–4,100	110,391	1,176	1.07	732	21	0.02
		4,101–33,000	183,721	877	0.48	458	22	0.01
		33,001–100,000	96,361	214	0.22	44	2	0.00
		>100,000	64,965	289	0.44	34	1	0.00
		Total GW	722,298	8,271	1.15	4,562	199	0.03
	Surface Water (SW)	≤100	6,735	95	1.41	64	6	0.09
		101–500	19,716	227	1.15	159	10	0.05
		501–1,000	12,828	90	0.70	70	7	0.05
		1,001–4,100	55,310	314	0.57	233	17	0.03
		4,101–33,000	175,758	525	0.30	399	41	0.02
		33,001–100,000	112,894	157	0.14	106	5	0.00
		>100,000	112,143	235	0.21	99	2	0.00
		Total SW	495,384	1,643	0.33	1,130	88	0.02
	GW & SW	Total CWS	1,217,682	9,914	0.81	5,692	287	0.02
TNCWS	GW	≤100	163,730	7,820	4.78	5,820	316	0.20
		101–500	52,891	2,418	4.57	1,869	99	0.19
		501–1,000	6,952	299	4.30	217	4	0.06
		>1,000	7,062	143	2.02	85	2	0.03
		Total GW	230,635	10,680	4.63	7,991	421	0.18
	SW	≤100	6,723	150	2.23	141	17	0.25
		101–500	2,854	75	2.63	69	13	0.46
		501–1,000	523	19	3.63	19		0.00
		>1,000	988	6	0.61	37		0.00
		Total SW	11,088	250	2.25	266	30	0.27
	GW & SW	Total TNCWS	241,723	10,930	4.52	8,257	451	0.19
NTNCWS	GW	≤100	46,505	1,476	3.17	1,061	34	0.07
		101–500	33,084	893	2.70	628	19	0.06
		501–1,000	9,531	166	1.74	103	2	0.02
		>1,000	13,138	177	1.35	103	5	0.04
		Total GW	102,258	2,712	2.65	1,895	60	0.06
	SW	≤100	1,668	32	1.92	30	4	0.24
		101–500	2,304	9	0.39	9	2	0.09
		501–1,000	932	6	0.64	5		0.00
		>1,000	1,316	1	0.08	1		0.00
		Total SW	6,220	48	0.77	45	6	0.10
	GW & SW	Total NTNCWS	108,478	2,760	2.54	1,940	66	0.06

[1] Number of samples that were specifically tested for *E. coli*. The denominator of the *E. coli* percent positive calculation includes this number plus the number of total coliform negative samples (number of total coliform samples—number of total coliform-positive samples).

[2] Percent of *E. coli*-positive was calculated as (number of *E. coli*-positive samples)/(number of *E. coli* samples taken) x 100.

Source: Derived using Six-Year Review 2 Data, which was filtered by including a State only if the State's PWSs as a group had submitted at least 50 percent of the expected sample-months of usable data. The *Total Coliform Compliance Monitoring Data Quality and Completion Report* (USEPA 2010b) includes a detailed description of this data cleaning process.

Exhibit VI–6 presents the number of acute and non-acute violations reported by PWSs. The number of violations is also an indicator of baseline water quality prior to implementation of the RTCR. As discussed in detail chapter 5 of the RTCR EA, EPA used these data to estimate the numbers of MCL violations and triggers for PWSs serving more than 4,100 people for the three options. Under the 1989 TCR, larger systems incur a relatively small number of violations annually, while smaller systems incur the majority.

EXHIBIT VI–6—BASELINE NUMBER OF TCR VIOLATIONS BY SYSTEM SIZE AND TYPE (2005)

	Ground water PWSs			Surface Water PWSs			All PWSs Total
	Non-Acute	Acute	Total	Non-Acute	Acute	Total	
CWSs							
<100	905	52	957	16	3	19	976
101–500	809	34	843	50	7	57	900
501–1,000	203	13	216	16	3	19	235
1,001–3,300	272	8	280	55	7	62	342
3,301–10,000	171	8	179	75	3	78	257
10,001–50,000	125	8	133	78	4	82	215
50,001–100,000	11	2	13	5	4	9	22
100,001–1M	1	1	2	4	1	5	7
> 1M							
Total CWSs	2,497	126	2,623	299	32	331	2,954
NTNCWSs							
<100	514	34	548	7	2	9	557
101–500	346	20	366	4		4	370
501–1,000	57	6	63	2		2	65
1,001–3,300	58	4	62				62
3,301–10,000	9	2	11	1		1	12
10,001–50,000	1		1				1
50,001–100,000							
100,001–1M	1		1				1
> 1M							
Total NTNCWSs	985	66	1,051	14	2	16	1,067
TNCWSs							
<100	2,665	278	2,943	19	5	24	2,967
101–500	833	76	909	11	1	12	921
501–1,000	133	11	144	4		4	148
1,001–3,300	58	2	60	1		1	61
3,301–10,000	5		5	1		1	6
10,001–50,000							
50,001–100,000							
100,001–1M							
> 1M							
Total TNCWSs	3,694	367	4,061	36	6	42	4,103
Grand Total	7,176	559	7,735	349	40	389	8,124

Note: The RTCR EA uses violations data for PWSs serving greater than 4,100 people to estimate triggers for these systems. Data for other system sizes is provided for reference.

Source: Acute/Non-Acute Violations from SDWIS/FED annual data for period ending 3rd quarter 2001–2007 (only 2005 data is presented in this exhibit). OH, U.S. territories, Tribal PWS data excluded. See the RTCR EA (USEPA 2012a) for additional details.

E. Anticipated Benefits of the RTCR

In promulgating the RTCR, EPA expects to further reduce the risk of contamination of public drinking water supplies from the current baseline risk under the 1989 TCR. The options considered during development of this rule and analyzed as part of the RTCR EA are designed to achieve this reduction while maintaining public health protection in a cost-effective manner.

This section examines the benefits in terms of trade-offs among compliance with the 1989 TCR option, the RTCR option, and the Alternative option. Because there are insufficient data reporting the co-occurrence in a single sample of fecal indicator *E. coli* and pathogenic organisms and because the available fecal indicator *E. coli* data from the Six-Year Review 2 dataset were limited to presence-absence data, EPA was unable to quantify health benefits for the RTCR. EPA used several methods to qualitatively evaluate the benefits of the RTCR options. The qualitative evaluation uses both the judgment of EPA as informed by the TCRDSAC deliberations as well as quantitative estimates of changes in total coliform occurrence and counts of systems implementing corrective actions. The evaluation characterizes, in relative terms, the reduction in risk for each regulatory scenario as compared to baseline conditions.

Since *E. coli* is an indicator of fecal contamination, EPA assumed that a decrease in *E. coli* occurrence in the

distribution system would be associated with a decrease in fecal contamination in the distribution system. In general, this decrease in fecal contamination should reduce the potential risk to human health for PWS customers. Thus, any reduction in *E. coli* occurrence is considered a benefit of the RTCR. Since fecal contamination may contain waterborne pathogens including bacteria, viruses, and parasitic protozoa, in general, a reduction in fecal contamination should reduce the risk from all of these contaminants.

As presented in Exhibit VI–5, the percentages of samples that are positive for total coliforms and *E. coli* are generally higher for PWSs serving 4,100 or fewer people than those serving more than 4,100 people. PWSs with higher total coliform and *E. coli* occurrence are more likely to be triggered into assessments and corrective action. As discussed previously, the assessments and corrective action lead to a decrease in total coliform and *E. coli* occurrence. Because the PWSs serving 4,100 or fewer people have a higher initial *E. coli* occurrence and are likely triggered into more assessments and corrective actions than larger PWSs, the increase in benefits for these small systems are likely more evident as compared to the larger systems. In particular, model results suggest that customers of small ground water TNCWSs serving 100 or fewer people, which constitute approximately 40 percent of PWSs, experience the most improvement in water quality under the RTCR. That is, the occurrence of *E. coli* is predicted to decrease more for these systems than for other systems types.

1. Relative Risk Analysis

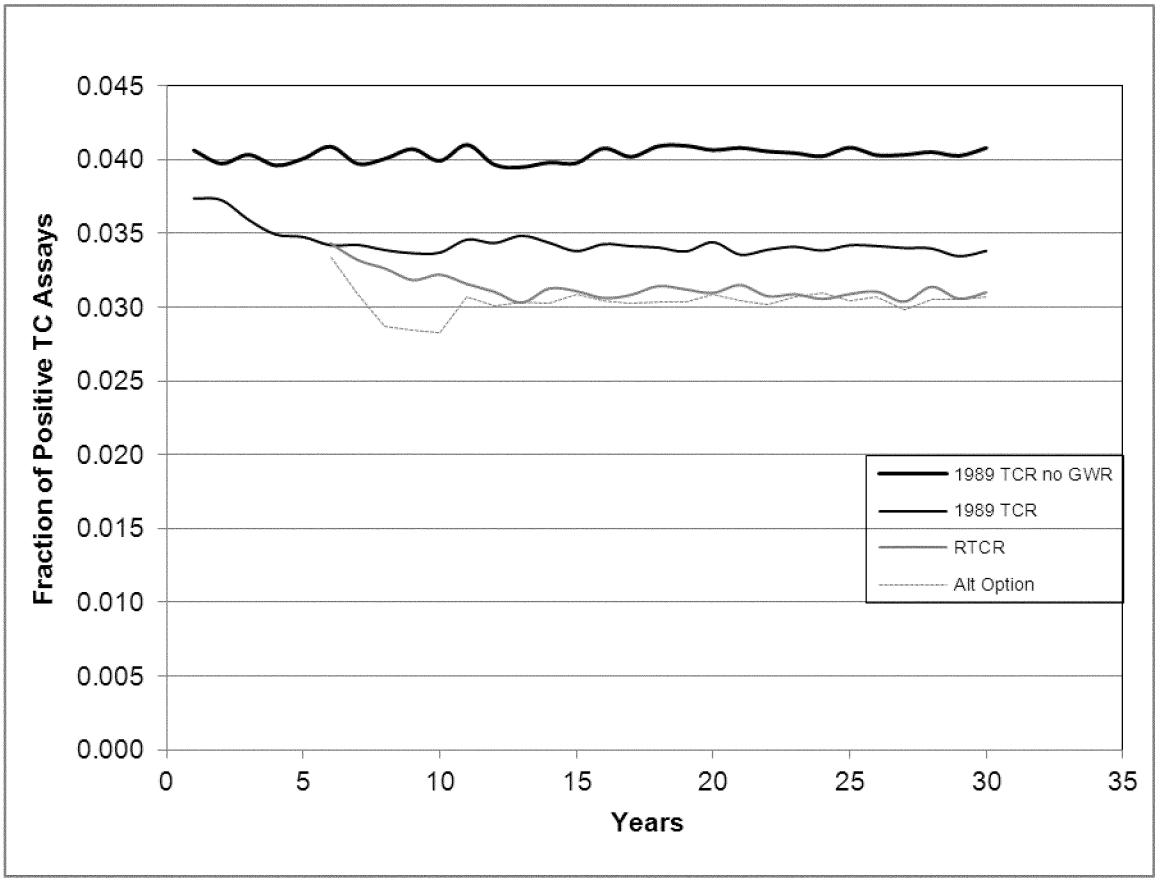
When revising an existing drinking water regulation, one of the main concerns is to ensure that backsliding on water quality and public health protection does not occur. SDWA requires that EPA maintain or improve public health protection for any rule revision. The RTCR is more stringent than the 1989 TCR with regard to protecting public health. The basis for this perspective is provided in this subsection and the following subsections (sections VI.E.2, *Changes in violation rates and corrective actions,* and VI.E.3, *Nonquantifiable benefits*) of this preamble.

Risk reduction for the RTCR is characterized by the activities performed that are presumed to reduce risk of exposing the public to contaminated water. These activities are considered under each rule component presented in Exhibit VI–8.

More frequent monitoring has the potential to decrease the risk of contamination in PWSs based on an enhanced ability to diagnose and mitigate system issues in a more timely fashion. Conversely, less frequent monitoring has the potential to increase risk. Real-time continuous sampling would mitigate the most risk possible based on sampling schedule; however, it would cost prohibitively more than the periodic sampling practiced under the 1989 TCR and included in the RTCR and the Alternative option. EPA's objective in proposing the sampling schedules included in the RTCR and Alternative option was to find an appropriate balance between the factors of risk mitigation and cost management.

Under the RTCR and Alternative option, the reduction in the number of required repeat samples and additional routine samples for some PWSs has the potential to contribute to increased risk for PWS customers (see also section III.C, *Monitoring,* and III.D, *Repeat Samples,* of this preamble for discussions on the additional routine sample and repeat sample provisions respectively). However, this potential increase in risk is expected to be more than offset by potential decreases in risk from increased routine monitoring (see section III.C of this preamble, *Monitoring*) and the addition of the assessments and corrective action provisions (see section III.E of this preamble, *Coliform Treatment Technique*) that find and fix problems indicated by monitoring. Exhibit VI–7 illustrates the predicted reduced frequency at which total coliforms occur subsequent to the implementation of the RTCR and Alternative option. As discussed previously, the RTCR uses total coliform occurrence as an indicator of potential pathways for possible contamination to enter the distribution system (see section III.B of this preamble, *Rule Construct: MCLG and MCL for E. coli and Coliform Treatment Technique*). Exhibit VI–7 illustrates the combined effects on total coliform occurrence resulting from changes in monitoring and the effects of assessments and corrective actions for the different rule options for very small systems. The relative trends indicated in Exhibit VI–7 for TNCWSs also pertain to other PWS categories as illustrated in chapter 5 of the RTCR EA. EPA chose to include the characterization for TNCWSs because they represent the system category of largest influence on the national impacts.

Exhibit VI-7 Ground Water Transient Non-community Water System (Summary of Systems Serving ≤ 4,100) Total Coliform Occurrence



Source: RTCR occurrence model as described in the RTCR EA (USEPA 2012a).

The effect that the elimination of public notification requirements for monthly/non-acute MCL violations has on risk is difficult to predict. Some factors, such as reduction in available public information and possible PWS complacency, lead to a potential increase in risk and other factors, such as less confusion (PN more in line with potential health risks) and PWSs resources used more efficiently, lead to a potential decrease, as discussed in Exhibit VI–8. This change to PN is addressing a key concern expressed by various stakeholders in the advisory committee and during the Six-Year Review 1 comment solicitation process. By eliminating the requirement and replacing it with assessment and corrective action requirements, the Agency expects less public confusion, more effective use of resources, increased transparency, and increased public health protection.

Other rule components are expected to have a negligible effect on risk. However, the overall effect of the RTCR is expected to be a further reduction in risk from the current baseline risk under the 1989 TCR. Chapter 6 of the RTCR EA presents a detailed discussion of the potential influence on health risk for each rule component.

EXHIBIT VI–8—POTENTIAL CHANGES IN RISK UNDER THE RTCR AND ALTERNATIVE OPTION RELATIVE TO THE 1989 TCR

RTCR Component	Factors leading to a potential increase in risk		Factors leading to a potential decrease in risk		Overall predicted change in risk	
	RTCR	Alternative	RTCR	Alternative	RTCR	Alternative
Implementation Activities.	None	None	None	None	No change	No change.

EXHIBIT VI–8—POTENTIAL CHANGES IN RISK UNDER THE RTCR AND ALTERNATIVE OPTION RELATIVE TO THE 1989 TCR—Continued

RTCR Component	Factors leading to a potential increase in risk		Factors leading to a potential decrease in risk		Overall predicted change in risk	
	RTCR	Alternative	RTCR	Alternative	RTCR	Alternative
Routine Monitoring (Including Reduced Monitoring).	None	None	Increased stringency in requirements to qualify for reduced monitoring along with requirement to return to baseline monitoring upon loss of these criteria is expected to result in decreased risk (That is, fewer PWSs will qualify and therefore PWSs will on average monitor more frequently than under the baseline for reduced monitoring).	PWSs all monitor monthly in the first few years of implementation of the RTCR, which is an increase in sampling frequency for systems that monitor quarterly or annually under the 1989 TCR. After the first few years, systems may reduce to quarterly, but none may reduce to annual monitoring, creating a decrease in risk for systems on annual monitoring under the 1989 TCR.	Decrease	Decrease.
Repeat Monitoring	Required repeat samples reduced from 4 to 3 for systems serving <1,000 people.	Same as RTCR option.	None	None	Increase	Increase.
Additional Routine Monitoring.	Additional routine samples are no longer required for PWSs monitoring monthly.. Ground water PWSs serving 1,000 or fewer people reduce additional routine samples from 5 to 3.	Same as RTCR option.	None	None	Increase	Increase.
Annual Site Visits	None (only States currently performing annual site visits are expected to continue).	Annual monitoring is not permitted under the Alternative option, so the protective benefit of the annual site visit is lost.	None	None	No change	Increase.
Assessments	None	None	Mandatory assessments are a new requirement.	Same as RTCR option.	Decrease	Decrease.
Corrective Actions	None	None	Mandatory corrective actions are a new requirement.	Same as RTCR option.	Decrease	Decrease.
Public Notification—Monthly/Non-Acute MCL Violations.	Reduction in available public information. Possible PWS complacency.	Same as RTCR option.	Less confusion (PN more in line with potential health risks). PWSs resources used more efficiently.	Same as RTCR option.	Unknown	Unknown.

EXHIBIT VI–8—POTENTIAL CHANGES IN RISK UNDER THE RTCR AND ALTERNATIVE OPTION RELATIVE TO THE 1989 TCR—Continued

RTCR Component	Factors leading to a potential increase in risk		Factors leading to a potential decrease in risk		Overall predicted change in risk	
	RTCR	Alternative	RTCR	Alternative	RTCR	Alternative
Public Notification—Monitoring and Reporting Violations.	None	None	Increased stringency of PNs motivates PWSs to conduct required sampling.	Same as RTCR option.	Decrease	Decrease.
Overall					Decrease	Decrease.

Notes: Detailed discussion of the rationale for determinations of potential risk for each rule component is presented in chapter 6 (section 6.2) of the RTCR EA (USEPA 2012a). Implementation activities consist of administrative activities by PWSs and States to implement the rule.

Assessment of potential changes in risk for monitoring components is an overall assessment. Potential changes (or static state) of risk for particular system sizes and types differ according to individual regulatory requirements and are discussed in section 6.2 of the RTCR EA. Chapter 3 of the RTCR EA provides a detailed description of the regulatory components for all three regulatory scenarios, and this preamble provides additional discussion of the TCRDSAC process and the rationale underlying the structure of the regulatory options considered.

2. Changes in Violation Rates and Corrective Actions

The quantified portion of the benefits analysis focuses on several measures that contribute to the changes in risk expected under the RTCR. Specifically, EPA modeled the predicted outcomes based on each regulatory option considered—baseline (1989 TCR), the RTCR (final rule), and the Alternative option—in the form of estimates of non-acute violations for the 1989 TCR and assessment triggers for the RTCR and Alternative option; *E. coli* violations; and the number of corrective actions implemented under each option. This section of the preamble includes six graphs (Exhibit VI–9 through Exhibit VI–14) that help to illustrate these endpoints.

Evaluation of each of these endpoints informed EPA's understanding of potential changes to the underlying quality of drinking water. In particular, the number of corrective actions performed has a strong relationship to potential improvements in water quality and public health. For a given rate of total coliform and *E. coli* occurrence, an increase in the number of corrective actions implemented leads to improved water quality. However, a reduction in sampling likely leads to a reduction in total coliform and *E. coli* positives being found, which in turn likely leads to a reduction in assessments and corrective actions being implemented. The number of total coliform and *E. coli* positives that are prevented, missed, or found under each regulatory option considered in comparison to those predicted under the 1989 TCR results in estimates of annual non-acute and acute violations (1989 TCR) and assessment triggers (RTCR and Alternative option). Section 6.4 of the RTCR EA presents a step-wise sensitivity analysis of the competing effects of additional protective activity (e.g., assessments and corrective actions) and decreased additional routine and repeat sampling of the RTCR compared to the 1989 TCR. The conclusions of this sensitivity analysis showed that for all categories of systems, more total coliform and *E. coli* positives are expected to be prevented than missed under the RTCR relative to the 1989 TCR.

For each of the graphs presented in Exhibit VI–9 through Exhibit VI–14, there are two main model drivers that affect the endpoints depicted: the total number of samples taken over time (including routine, additional routine, and repeat samples) and the effect of corrective actions taken. When looking at the comparisons between the 1989 TCR with the RTCR across all PWSs, the overall effect of the total numbers of samples taken is negligible because the total number of samples predicted to be taken throughout the period of analysis is almost the same (approximately 82M samples) under both the 1989 TCR and RTCR. For the Alternative option, the analysis predicts that approximately 88M total samples are taken over the period of analysis. Exhibit VI–18 of this preamble presents estimated total numbers of samples taken over the 25-year period of analysis. Based on the relationships of total samples taken among the 1989 TCR, RTCR, and Alternative option, the best way to interpret the graphs presented in this section is in a step-wise manner.

The first comparison that should be made is between the 1989 TCR option and RTCR. Because similar total numbers of samples are taken under the 1989 TCR and RTCR, the major effect seen in the graphs can be isolated to the effects that implementation of corrective actions has on underlying occurrence and how that occurrence influences the endpoint in question (assessments, *E. coli* MCL violations, and corrective actions). In each graph, this is depicted by a marked reduction in the endpoint under the RTCR compared to the 1989 TCR option and is a reflection of overall better water quality. The second comparison can then be made of the Alternative option against the RTCR. In each graph, the predicted results (assessments, *E. coli* MCL violations, and corrective actions) for the Alternative option are above those for the RTCR and represent an additional benefit over the RTCR. This additional benefit is primarily a function of the additional diagnostic abilities gained through increased monitoring under the Alternative option, and is especially prominent in the early years of the analysis, since all systems are initially required to monitor at least monthly.

More detailed descriptions of each endpoint considered in terms of the evaluation process described previously are provided in this section as they apply to the individual graphs in Exhibit VI–9 through VI–14. Each of the graphs shown in this section is presented first in nondiscounted terms, and then based on a discount rate of three percent to reflect the reduced valuation of potential benefits over time, consistent with the presentation of costs in the section that follows. Graphs of benefits discounted using seven percent discounted rates are presented in Appendix B of the RTCR EA.

Exhibit VI–9 shows the effect (on average across all PWSs) of the RTCR and the Alternative option on the annual number of non-acute violations (1989 TCR) and assessment triggers (RTCR and Alternative option) over time. The estimated reduction of annual assessment triggers (from the 1989 TCR

estimates of non-acute violations) by approximately 1,000 events under the RTCR is a reflection of the improved water quality expected under the RTCR. A similar but smaller reduction in non-acute violations (Level 1 triggers) from the 1989 TCR is seen under the Alternative option. The larger initial estimate of assessment triggers followed by a higher steady state number for the Alternative option than seen under the RTCR reflects the diagnostic abilities provided by increased sampling under the Alternative option. The additional triggers identified by increased sampling under the Alternative option translate into greater potential benefits than under the RTCR.

Exhibit VI–10 shows the effect (on average across all PWSs) of the RTCR and the Alternative option with respect to *E. coli* violations found over the 25-year period of analysis in comparison to the 1989 TCR. The overall reduction in annual *E. coli* violations under the RTCR of more than 100 events is a measure that should correlate more closely with expected benefits (that is, reductions in adverse health outcomes) than non-acute events (as presented in Exhibit VI–9) because *E. coli* violations are a direct result of measurement of fecal contamination in water. A similar but smaller reduction in *E. coli* violations is seen under the Alternative option after steady state is achieved. This is the result of two off-setting effects. The ''true'' number of steady state violations under the Alternative option is lower because there is a greater likelihood that violations will be found and fixed. However, the additional monitoring leads to a higher percentage of violations being detected. This second effect outweighs the first, so that the total number of detected violations in the steady state is higher than for the RTCR, even though the underlying ''true'' number of violations is lower. This lower number of ''true'' violations means that the Alternative option is more protective of public health, even though more violations are detected.

Exhibit VI–11 presents estimates over the 25-year period of analysis of the increase in corrective actions relative to the 1989 TCR (on average across all PWSs) attributable to the RTCR and Alternative option. Performance of these additional corrective actions is expected to result in the most direct benefits under the RTCR. Because only the incremental numbers of corrective actions estimated under the RTCR and Alternative option were modeled, the reference point for comparison to the 1989 TCR is the base (zero) line in the graph. The RTCR EA assumes that corrective actions are already being performed under the 1989 TCR. Baseline corrective actions are taken into account by assuming only a modest incremental increase of 10 percent in implementation of effective corrective actions under both the RTCR and Alternative option.

Exhibit VI–11 indicates that more corrective actions are implemented under the Alternative option than under the RTCR. This is driven, again, by the increased diagnostic power of more sampling and reflects additional potential benefits beyond those gained under the RTCR.

Taken together, Exhibit VI–9 through Exhibit VI–11 indicate that the modeled endpoints for the RTCR and the Alternative option predict positive benefits in comparison to the 1989 TCR; in particular, the Alternative option captures more benefits than the RTCR. Similar to the patterns seen in Exhibits VI–9 through VI–11, for each of the discounted endpoints presented over time in Exhibits VI–12 though VI–14, the graphs show that (on average across all PWSs) the Alternative option provides more benefit than the RTCR, and both provide more benefit than the 1989 TCR. These outcomes are consistent with the qualitative assessment of the benefits summarized in this section of this preamble.

The major difference between the RTCR and the Alternative option is the increased monitoring that is required under the Alternative option. The increased diagnostic ability of the extra samples taken under the Alternative option is seen in the large difference in the endpoint counts through the first several years in Exhibit VI–9 through Exhibit VI–14. Absent this effect, the Alternative option essentially mirrors the RTCR in the exhibits. Even though the predicted results (assessments, *E. coli* MCL violations, and corrective actions) under the Alternative option are greater than the 1989 TCR at first, the trend is due to initially finding more problems through monitoring. The increased monitoring during the first several years under the Alternative option results in a frontloading of benefits at the beginning of the implementation period. The benefits, however, tend to even out over time between the RTCR and Alternative option as eligible systems qualify for less intense (quarterly) monitoring under the Alternative option. However, the Alternative option leads to a greater number of assessments, *E. coli* MCL violations, and corrective actions than the RTCR because all PWSs are required to sample no less than quarterly under the Alternative option while under the RTCR qualifying PWSs are permitted to sample at a minimum of once per year: more monitoring has the potential for more triggered assessments, corrective actions, and/or violations than less monitoring.

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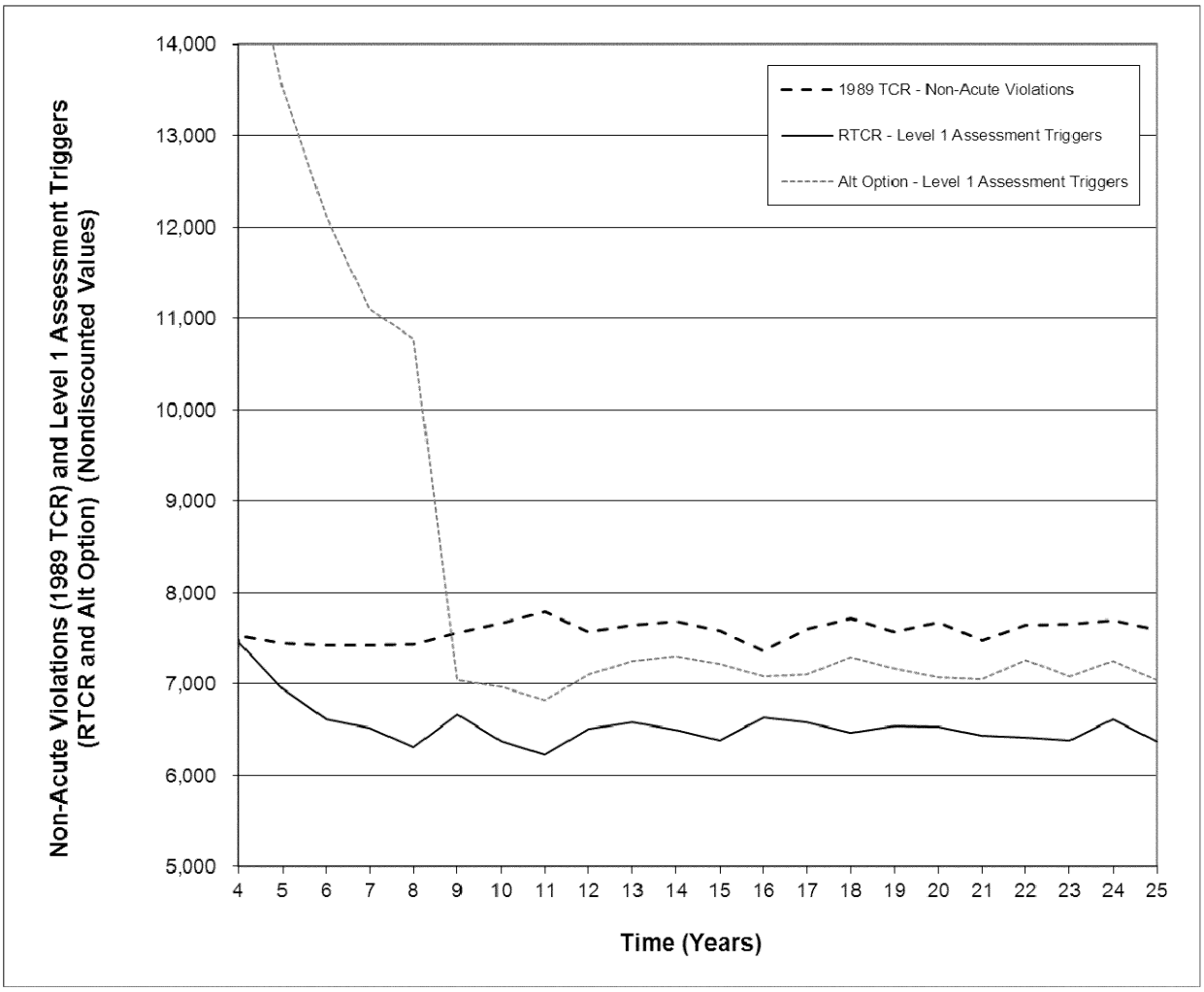
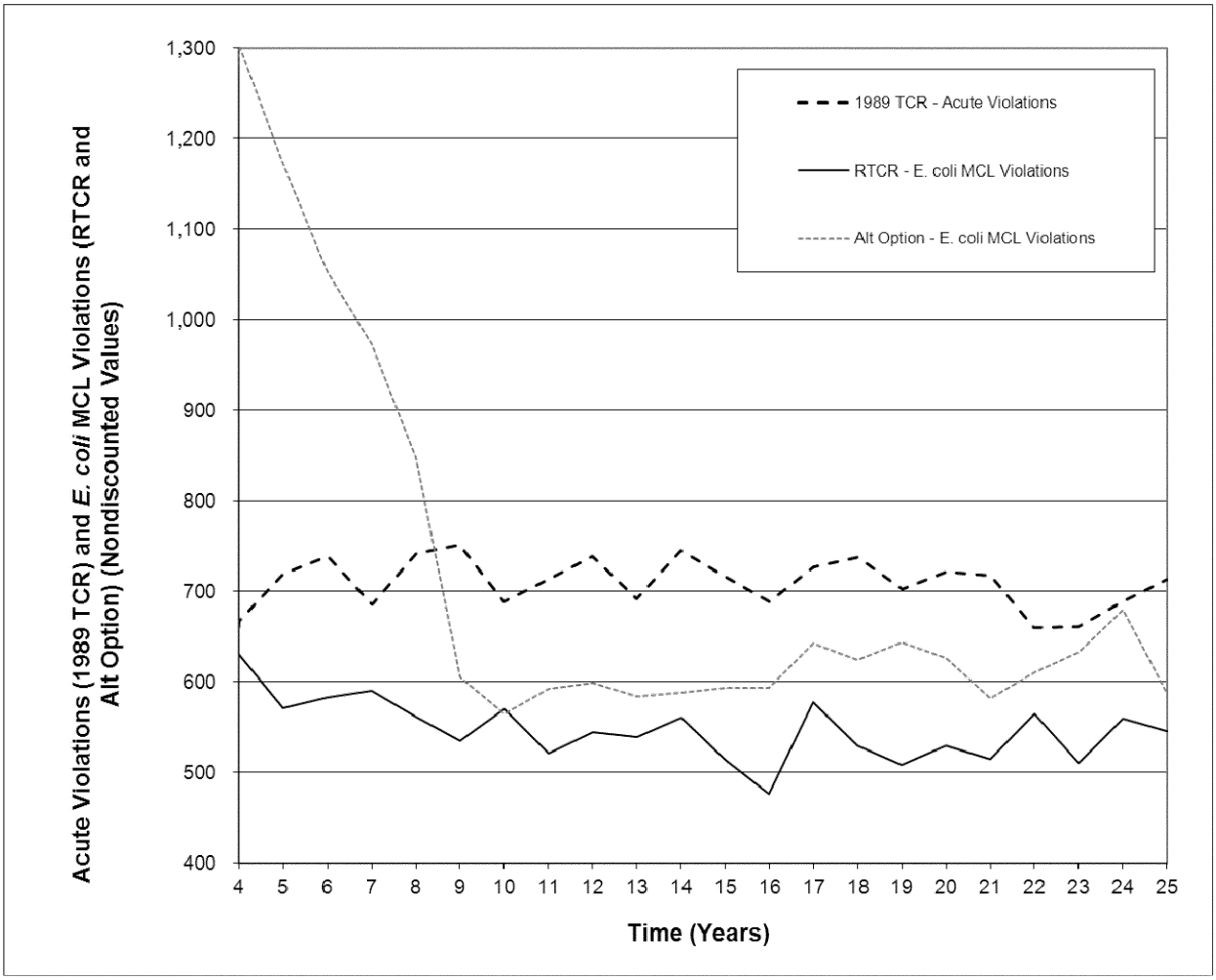
Exhibit VI-9 Estimates of Non-Acute Violations (1989 TCR) and Level 1 Assessment Triggers (RTCR and Alternative Option)



Notes: X-axis begins at Year 4 after rule promulgation, which is the first year of full implementation of the RTCR and Alternative option. The annual rates of non-acute violations (1989 TCR) and Level 1 assessment triggers (RTCR and Alternative option) as predicted by the model reach a steady state beginning in approximately Year 9, by which time PWSs that are expected to meet the criteria for reduced monitoring begin reduced monitoring, and the distribution of PWSs that monitor monthly, quarterly, and annually is assumed to remain relatively constant. Estimates represent the annual number of assessment triggers found by each option and the non-acute violations found under the 1989 TCR.

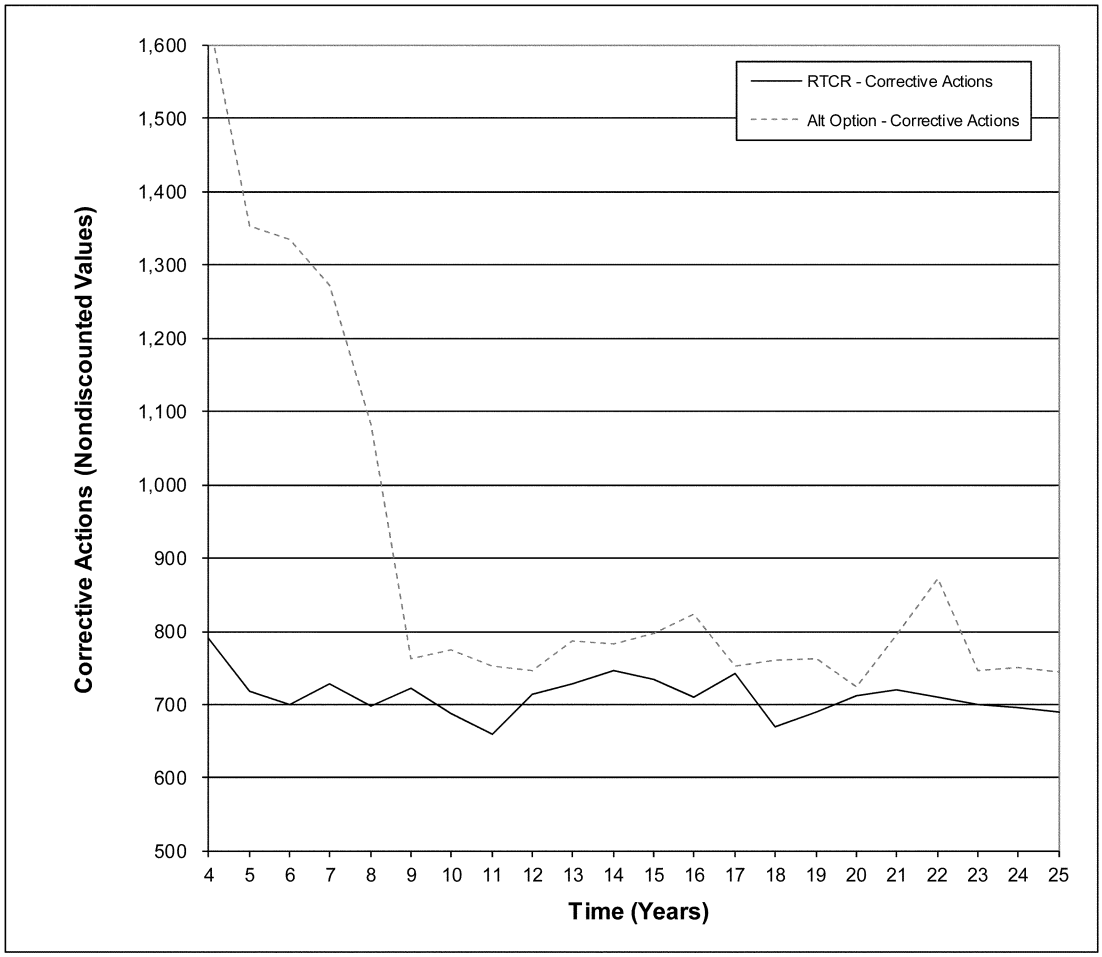
Source: RTCR occurrence model output.

Exhibit VI-10 Estimates of Acute Violations (1989 TCR) and *E. coli* MCL Violations (RTCR and Alternative Option)



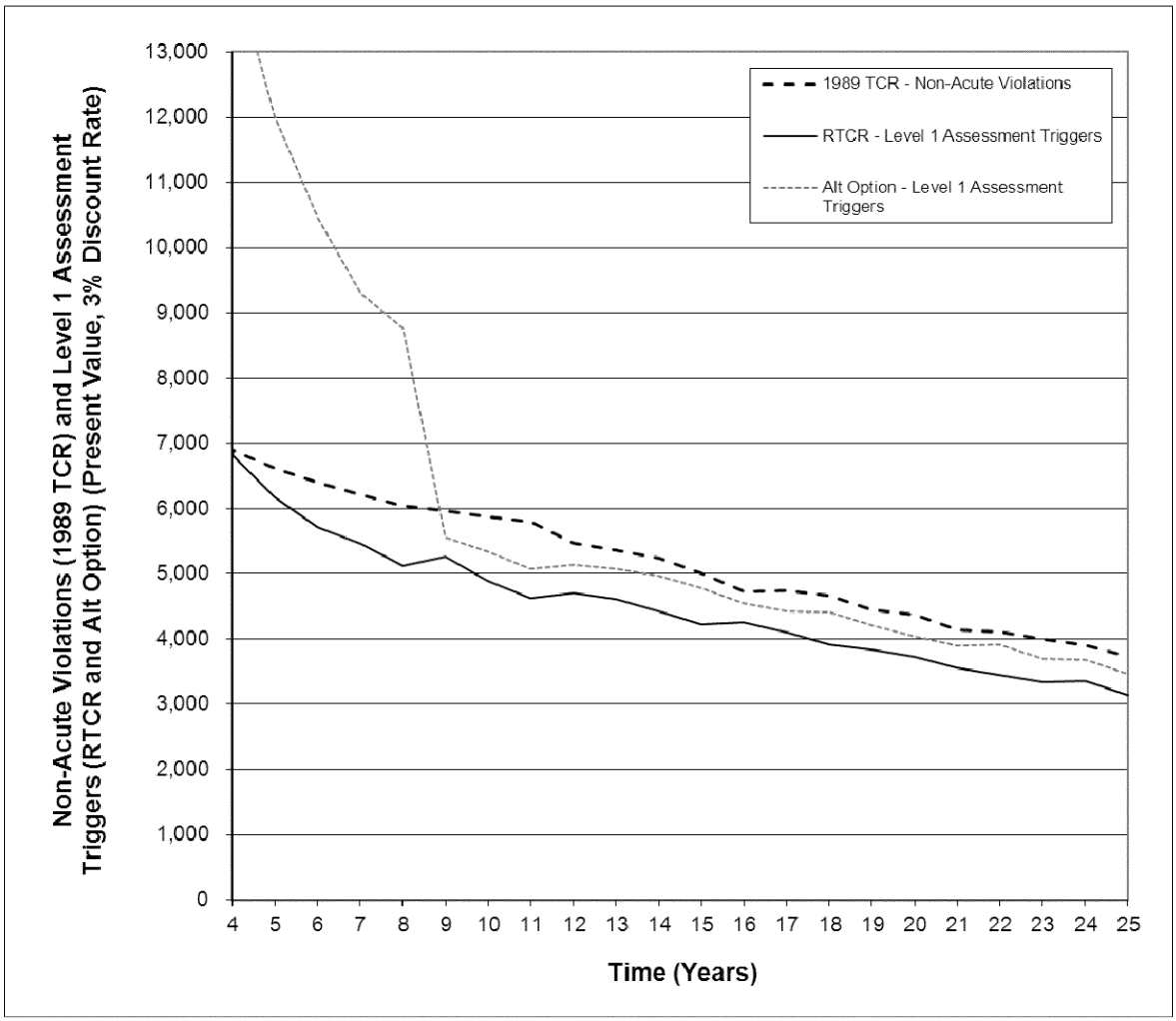
Notes: X-axis begins at Year 4 after rule promulgation, which is the first year of full implementation of the RTCR and Alternative option. The annual rates of acute violations (1989 TCR) and *E. coli* MCL violations (RTCR and Alternative option) as predicted by the model reach steady state in approximately Year 9, by which time PWSs that are expected to meet the criteria for reduced monitoring begin reduced monitoring, and the distribution of PWSs that monitor monthly, quarterly, and annually is assumed to remain relatively constant. Estimates represent the annual number of acute violations found by each option and the 1989 TCR.
Source: RTCR occurrence model output.

Exhibit VI-11 Estimates of Corrective Actions



Notes: X-axis begins at Year 4 after rule promulgation, which is the first year of full implementation of the RTCR and Alternative option. The annual rates of corrective actions as predicted by the model reach a steady state beginning approximately in Year 9, by which time PWSs that are expected to meet the criteria for reduced monitoring begin reduced monitoring, and the distribution of PWSs that monitor monthly, quarterly, and annually is assumed to remain relatively constant. All corrective actions performed are in addition to activity under the 1989 TCR, which does not require corrective actions. Therefore the 1989 TCR is not included in this graph.
Source: RTCR occurrence model output.

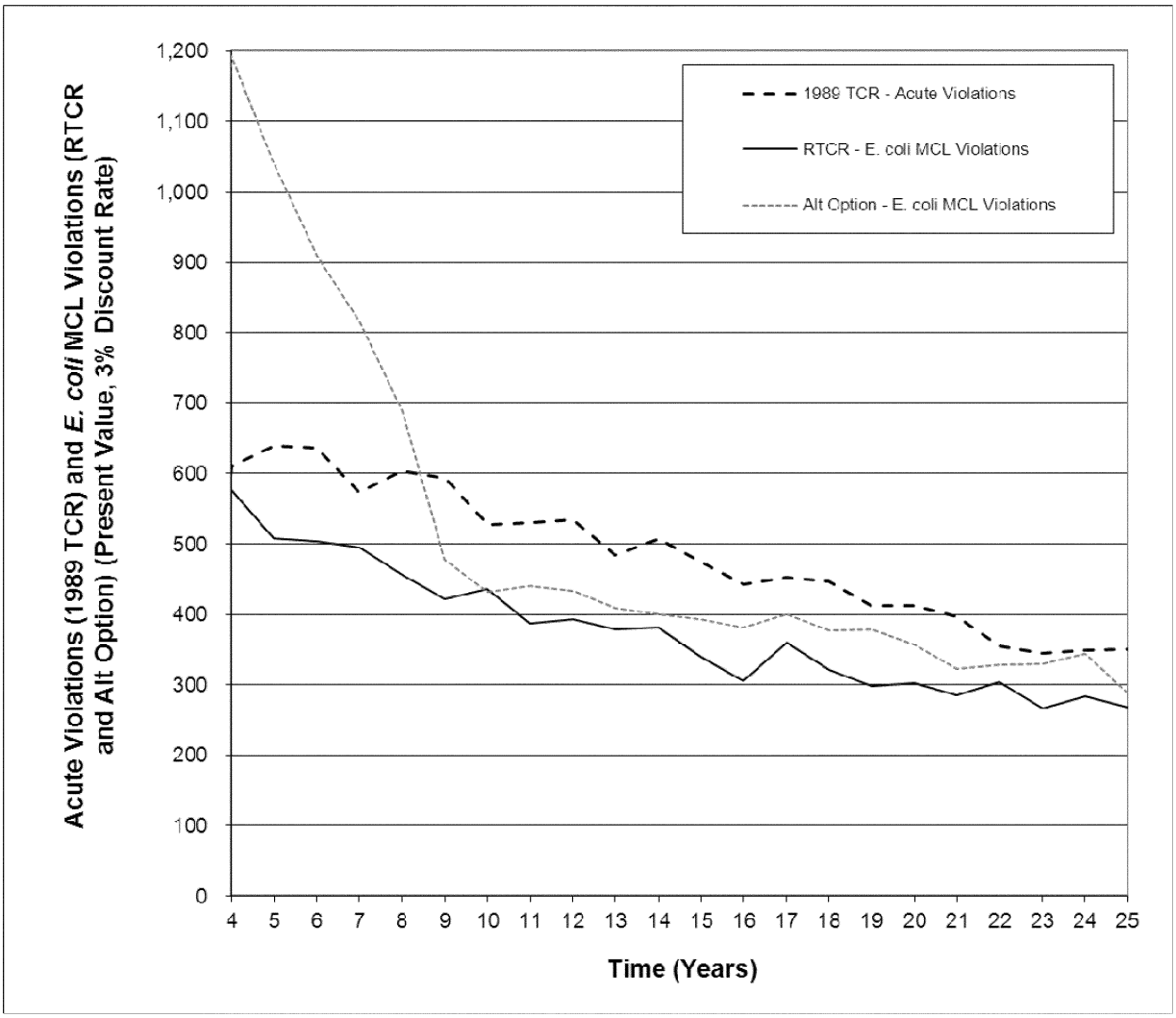
Exhibit VI-12 Discounted Estimates of Non-Acute Violations (1989 TCR) and Level 1 Assessment Triggers (RTCR and Alternative Option) (three percent discount rate)



Notes: X-axis begins at Year 4 after rule promulgation, which is the first year of full implementation of the RTCR and Alternative option. The annual rates of non-acute violations (1989 TCR) and Level 1 assessment triggers (RTCR and Alternative option) as predicted by the model reach a steady state beginning in approximately Year 9, by which time PWSs that are expected to meet the criteria for reduced monitoring begin reduced monitoring, and the distribution of PWSs that monitor monthly, quarterly, and annually is assumed to remain relatively constant. Estimates represent the annual number of assessment triggers found by each option and the non-acute violations found under the 1989 TCR.

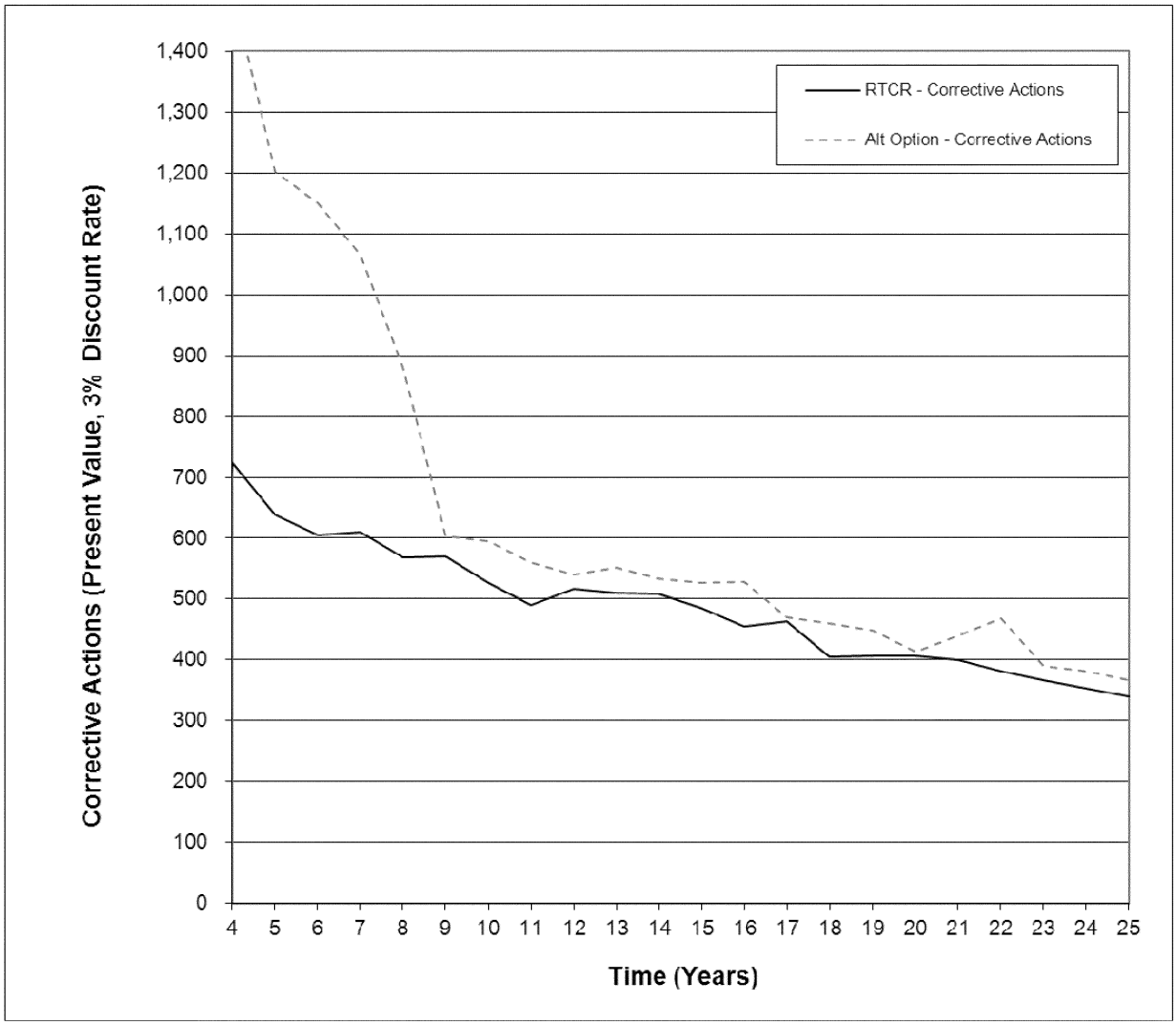
Source: RTCR occurrence model output.

Exhibit VI-13 Discounted Estimates of Acute Violations (1989 TCR) and *E. coli* Violations (RTCR and Alternative Option) (three percent discount rate)



Notes: X-axis begins at Year 4 after rule promulgation, which is the first year of full implementation of the RTCR and Alternative option. The annual rates of acute violations (1989 TCR) and *E. coli* MCL violations (RTCR and Alternative option) as predicted by the model reach steady state in approximately Year 9, by which time PWSs that are expected to meet the criteria for reduced monitoring begin reduced monitoring, and the distribution of PWSs that monitor monthly, quarterly, and annually is assumed to remain relatively constant. Estimates represent the annual number of acute violations found by each option and the 1989 TCR.
Source: RTCR occurrence model output.

Exhibit VI-14 Discounted Estimates of Corrective Actions (three percent discount rate)



Notes: X-axis begins at Year 4 after rule promulgation, which is the first year of full implementation of the RTCR and or Alternative option. The annual rates of corrective actions as predicted by the model reach a steady state beginning in approximately Year 9, by which time PWSs that are expected to meet the criteria for reduced monitoring begin reduced monitoring, and the distribution of PWSs that monitor monthly, quarterly, and annually is assumed to remain relatively constant. All corrective actions performed are in addition to activity under the 1989 TCR, which does not require corrective actions. Therefore the 1989 TCR is not included in this graph.
Source: RTCR occurrence model output.

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3. Nonquantifiable Benefits

a. Potential decreased incidence of endemic illness from fecal contamination, waterborne pathogens, and associated outbreaks. As discussed in section VI.E of this preamble, *Anticipated Benefits of the RTCR,* and chapter 2 of the RTCR EA, benefits from the RTCR may include avoidance of a full range of health effects from the consumption of fecally contaminated drinking water, including the following: acute and chronic illness, endemic and epidemic disease, waterborne disease outbreaks, and death. EPA recognizes that the EPA-approved standard methods available for *E. coli* do not typically identify the presence of the pathogenic *E. coli* strains, such as *E. coli* O157:H7. Thus, *E. coli* occurrence, as used in this EA, serves as an indication of fecal contamination but not necessarily pathogenic contamination. See also discussion in section II.D of this preamble, *Public Health Concerns Addressed by the Revised Total Coliform Rule.*

EPA was unable to quantify the cases of morbidity or mortality avoided because there are insufficient data reporting the co-occurrence of fecal indicator *E. coli* and pathogenic organisms in a single water sample, and because the available fecal indicator *E. coli* data from the Six-Year Review 2 dataset were limited to presence-absence data. Instead, EPA estimated changes in total coliform and fecal indicator *E. coli* occurrence and changes in number of corrective actions as measures of reduced risk. As discussed previously, the assessments and corrective actions required under the RTCR will help lead to a decrease in total coliform and *E. coli* occurrence in drinking water. Since fecal

contamination can contain waterborne pathogens including bacteria, viruses, and parasitic protozoa, in general, a reduction in fecal contamination should reduce the potential risk from all of these contaminants and the associated primary and secondary endemic disease burden, both acute and chronic.

b. Other nonquantifiable benefits. This section describes other nonquantified benefits, which include those associated with increased knowledge regarding system operation, accelerated maintenance and repair, avoided costs of outbreaks, and reductions in averting behavior.

By requiring PWSs to conduct assessments that meet minimum elements focused on identifying sanitary defects in response to triggers for total coliform- or *E. coli*-positive samples, the RTCR increases the likelihood that PWS operators, in particular those of systems triggered to conduct assessments and corrective action, will develop further understanding of system operations and improve and practice preventive maintenance compared to the 1989 TCR, which does not require PWSs to perform assessments and corrective action.

Another non-quantified benefit is that systems may choose corrective actions that also address other drinking water contaminants. For example, correcting for a pathway of potential contamination into the distribution system can possibly also mitigate a variety of other potential contaminants. Due to the lack of data available on the effect of corrective action on contamination entering through distribution system pathways, EPA has not quantified such potential benefits.

Some systems may see additional nonquantified benefits associated with the acceleration of their capital replacement fund investments in response to early identification of impending problems with large capital components. Although such capital investment will eventually occur in the absence of RTCR requirements, earlier investment may ensure that problems are addressed in a preventive manner and may preclude some decrease in protection that might have occurred otherwise. At the very least, the increased operator awareness is expected to reduce the occurrence of unplanned capital expenditures in any given year. However, because of the difficulty of projecting when capital replacements would occur, EPA has not costed this acceleration of capital replacement, so there would also be a nonquantified cost of making such investments sooner.

Another major non-health benefit is the avoided costs associated with outbreak response. Outbreaks can be very costly for both the PWS and the community in which they occur. Avoided outbreak response costs include such costs as issuing public health warnings, boiling drinking water and providing alternative supplies, remediation and repair, and testing and laboratory costs. Reduced total coliform occurrence resulting from the RTCR may also lead to a reduction of costs associated with boil-water orders, which some States require following non-acute violations under the 1989 TCR. Taken together, these expenses can be quite significant. For example, an analysis of the economic impacts of a waterborne disease outbreak in Walkerton, Ontario (population 5,000) estimated the economic impact (excluding estimates of the value of a statistical life for seven deaths and intangible costs for illness-related suffering) to be over $45.9M in 2007 Canadian dollars (approximately $42.8M 2007 US dollars) (Livernois 2002). Note that some of these costs were incurred by individuals and businesses in neighboring communities. The author of the study suggested that this was a conservative estimate.

In addition, the RTCR may also reduce uncertainty regarding drinking water safety, which may lead to reduced costs for averting behaviors. Averting behaviors include the use of bottled water and point-of-use devices. This benefit also includes the reductions in time spent on averting behavior such as the time spent obtaining alternative water supplies.

F. Anticipated Costs of the RTCR

To understand the net impacts of the RTCR on public water systems and States in terms of costs, EPA first used available data, information, and best professional judgment to characterize how PWSs and States are currently implementing the 1989 TCR. Then, EPA considered the net change in costs that results from implementing the RTCR or Alternative option as compared to the costs of continuing with the 1989 TCR. The objective was to present the net change in costs resulting from revisions to the 1989 TCR rather than absolute total costs of implementing the 1989 TCR as revised by the RTCR. More detailed information on cost estimates is provided in the sections that follow and a complete discussion can be found in chapter 7 of the RTCR EA. A detailed discussion of the RTCR requirements is located in section III of this preamble, *Requirements of the Revised Total Coliform Rule.*

1. Total Annualized Present Value Costs

To compare cost of compliance activities for the three regulatory scenarios, the year or years in which all costs are expended are determined and the costs are then calculated as a net present value. For the purposes of this EA, one-time and yearly costs were projected over a 25-year time period to allow comparison with other drinking water regulations using the same analysis period. For this analysis, the net present values of costs in 2007 dollars are calculated using discount rates of three percent and seven percent. These present value costs are then annualized over the 25-year period using the two discount rates.

Exhibit VI–15 summarizes the comparison of total and net change in annualized present value costs of the RTCR and Alternative option relative to the 1989 TCR baseline. A continuation of the 1989 TCR will result in no net change in costs. In calculating the 1989 TCR baseline, not all activities that PWSs and States are performing under the 1989 TCR were quantified (see Exhibit VI–16 of this preamble). Some of these activities are not required under the 1989 TCR but PWSs are performing them nonetheless (e.g., corrective actions); or these activities are required under the 1989 TCR and PWSs and States will continue to perform them under either the RTCR or Alternative option (e.g., revising sample siting plans). Instead of determining the absolute costs of performing these activities, EPA estimated the net increase in costs from these activities as a result of implementing either the RTCR or the Alternative option. The net change in mean annualized national costs of the RTCR option relative to the 1989 TCR is estimated to be approximately $14M using either a three percent or seven percent discount rate. The net change in mean annualized national costs for the Alternative option relative to the 1989 TCR are estimated to be approximately $30M using a three percent discount rate and $32M using a seven percent discount rate.

Under the RTCR, public water systems are estimated to incur greater than 90 percent of the RTCR's net annualized costs. States are expected to incur the remaining costs.

EXHIBIT VI–15—COMPARISON OF TOTAL AND NET CHANGE FROM 1989 TCR IN ANNUALIZED COSTS

[$Millions, 2007$]

	3% discount rate			7% discount rate		
	PWSs	State	Total	PWSs	State	Total
1989 TCR: Baseline [1]	185	0.9	186	178	0.9	179
RTCR: Baseline + Incremental [2]	199	1.1	200	192	1.3	193
RTCR: Net Change	14	0.1	14	14	0.4	14
RTCR: Percent Change	8%	16%	8%	8%	48%	8%
Alternative option: Baseline + Incremental [2]	214	1.2	216	209	1.5	210
Alternative option: Net Change	29	0.3	30	31	0.6	32
Alternative option: Percent Change	16%	34%	16%	17%	69%	18%

Note: Detail may not add due to independent rounding.
Source: RTCR EA (USEPA 2012a).
[1] Does not quantify all 1989 TCR components.
[2] For components not quantified for the 1989 TCR, only the net increase in the costs of these components is considered for the RTCR and Alternative option (e.g., corrective action costs).

Exhibit VI–16 presents the comparison of total and net change in annualized costs for PWSs and States by rule component. The table shows that corrective action costs are the most significant contributors to the net increase in costs for PWSs under the RTCR. For the Alternative option, routine monitoring costs are the most significant contributor to the net increase in costs for PWSs. For States, revision of sample siting plans contributes most to the cost increase under the RTCR and Alternative option. For both PWSs and States, a net decrease in costs associated with PN requirements helps to offset the total net cost increase.

EXHIBIT VI–16—COMPARISON OF TOTAL AND NET CHANGE IN ANNUALIZED COSTS BY RULE COMPONENT

[$Millions, 2007$]

	3% discount rate			7% discount rate		
	PWSs	State	Total	PWSs	State	Total
	Rule Implementation and Annual Administration					
1989 TCR—Total	.....	.....	.....	.....	.....	.....
RTCR—Total	2.77	0.18	2.95	4.00	0.26	4.26
RTCR—Net Change	2.77	0.18	2.95	4.00	0.26	4.26
Alternative Option—Total	2.77	0.18	2.95	4.00	0.26	4.26
Alternative Option—Net Change	2.77	0.18	2.95	4.00	0.26	4.26
	Sample Siting Plan Revision					
1989 TCR—Total	.....	.....	.....	.....	.....	.....
RTCR—Total	0.59	0.42	1.01	0.84	0.59	1.42
RTCR—Net Change	0.59	0.42	1.01	0.84	0.59	1.42
Alternative Option—Total	0.59	0.42	1.01	0.84	0.59	1.42
Alternative Option—Net Change	0.59	0.42	1.01	0.84	0.59	1.42
	Routine Monitoring					
1989 TCR—Total	170.59	.....	170.59	163.94	.....	163.94
RTCR—Total	174.71	.....	174.71	167.74	.....	167.74
RTCR—Net Change	4.12	.....	4.12	3.80	.....	3.80
Alternative Option—Total	187.50	.....	187.50	182.48	.....	182.48
Alternative Option—Net Change	16.91	.....	16.91	18.54	.....	18.54
	Additional Routine Monitoring					
1989 TCR—Total	3.87	.....	3.87	3.72	.....	3.72
RTCR—Total	1.12	.....	1.12	1.09	.....	1.09
RTCR—Net Change	(2.75)	.....	(2.75)	(2.63)	.....	(2.63)
Alternative Option—Total	0.78	.....	0.78	0.66	.....	0.66
Alternative Option—Net Change	(3.10)	.....	(3.10)	(3.06)	.....	(3.06)
	Repeat Monitoring					
1989 TCR—Total	5.11	.....	5.11	4.92	.....	4.92
RTCR—Total	4.88	.....	4.88	4.70	.....	4.70
RTCR—Net Change	(0.23)	.....	(0.23)	(0.22)	.....	(0.22)
Alternative Option—Total	5.66	.....	5.66	5.59	.....	5.59

EXHIBIT VI–16—COMPARISON OF TOTAL AND NET CHANGE IN ANNUALIZED COSTS BY RULE COMPONENT—Continued

[$Millions, 2007$]

	3% discount rate			7% discount rate		
	PWSs	State	Total	PWSs	State	Total
Alternative Option—Net Change	0.54	.....	0.54	0.67	.....	0.67
	Annual Site Visits					
1989 TCR—Total	.....	.....	.....	.....	.....	.....
RTCR—Total	.....	.....	.....	.....	.....	.....
RTCR—Net Change	.....	.....	.....	.....	.....	.....
Alternative Option—Total	.....	.....	.....	.....	.....	.....
Alternative Option—Net Change	.....	.....	.....	.....	.....	.....
	Level 1 Assessment					
1989 TCR—Total	1.13	0.21	1.34	1.08	0.20	1.29
RTCR—Total	1.63	0.20	1.84	1.57	0.20	1.77
RTCR—Net Change	0.51	(0.01)	0.50	0.49	(0.01)	0.48
Alternative Option—Total	1.76	0.23	1.99	1.72	0.23	1.94
Alternative Option—Net Change	0.63	0.02	0.65	0.63	0.02	0.65
	Level 2 Assessment					
1989 TCR—Total	0.70	0.26	0.96	0.68	0.25	0.92
RTCR—Total	0.90	0.19	1.08	0.88	0.18	1.06
RTCR—Net Change	0.20	(0.07)	0.12	0.20	(0.07)	0.13
Alternative Option—Total	1.26	0.29	1.55	1.30	0.31	1.61
Alternative Option—Net Change	0.55	0.03	0.58	0.62	0.06	0.68
	Corrective Actions Based on Level 1 Assessments					
1989 TCR—Total	.....	.....	.....	.....	.....	.....
RTCR—Total	9.62	0.01	9.63	8.14	0.01	8.15
RTCR—Net Change	9.62	0.01	9.63	8.14	0.01	8.15
Alternative Option—Total	10.01	0.01	10.02	8.52	0.01	8.53
Alternative Option—Net Change	10.01	0.01	10.02	8.52	0.01	8.53
	Corrective Actions Based on Level 2 Assessments					
1989 TCR—Total	.....	.....	.....	.....	.....	.....
RTCR—Total	2.82	0.00	2.82	2.49	0.00	2.49
RTCR—Net Change	2.82	0.00	2.82	2.49	0.00	2.49
Alternative Option—Total	3.78	0.01	3.79	3.57	0.01	3.58
Alternative Option—Net Change	3.78	0.01	3.79	3.57	0.01	3.58
	Public Notification					
1989 TCR—Total	3.75	0.44	4.19	3.60	0.42	4.02
RTCR—Total	0.26	0.06	0.32	0.25	0.06	0.31
RTCR—Net Change	(3.49)	(0.38)	(3.86)	(3.35)	(0.36)	(3.71)
Alternative Option—Total	0.35	0.08	0.43	0.35	0.08	0.44
Alternative Option—Net Change	(3.40)	(0.36)	(3.76)	(3.25)	(0.34)	(3.58)

Note: Detail may not add due to independent rounding.

Assumes a certain level of assessment activity already occurs under the 1989 TCR, as discussed in Chapter 7 of the RTCR EA (USEPA 2012a).

Not all 1989 TCR components are quantified. For components not quantified for the 1989 TCR, only the net increase in the costs of these components is considered for the RTCR and Alternative option (e.g., corrective action costs).

Source: RTCR EA (USEPA 2012a).

2. PWS Costs

Like the 1989 TCR, the RTCR applies to all PWSs. Exhibit VI–17 presents the total and net change in annualized costs to PWSs by size and type for the three regulatory options. No net change in costs will result from a continuation of the 1989 TCR. Among PWSs serving 4,100 or fewer people, looking at the three percent discount rate, the largest increase in aggregate net costs is incurred by the TNCWSs serving 100 or fewer people under either the RTCR ($5.3M) or Alternative option ($14.7M) because of the large number of systems. On a per system basis, this translates to a net annualized present value increase of approximately $86 per system under the RTCR and $240 per system under the Alternative option for the TNCWSs serving 100 or fewer people. As described in section VII.C of this preamble, *Regulatory Flexibility Act (RFA),* none of the small TNCWSs are estimated to have costs that are greater than or equal to three percent of their revenue and only 61 small systems (0.04%) are estimated to have costs greater than or equal to one percent of their revenue.

The total net change in national annualized present value costs for all

PWSs serving greater than 4,100 people (approximately $5.6M using three percent discount rate) is the same under the RTCR and Alternative option. This is expected because the provisions for PWSs serving greater than 4,100 are the same under the RTCR and the Alternative option. Monitoring requirements for PWSs serving greater than 4,100 people remain essentially unchanged under either the RTCR or Alternative option. The observed overall net increase in costs for PWSs serving greater than 4,100 people is driven primarily by the requirements to conduct assessments and to correct any sanitary defects that are found.

EXHIBIT VI–17—TOTAL AND NET CHANGE IN ANNUALIZED COSTS TO PWSS BY PWS SIZE AND TYPE

[$Millions, 2007$]

PWS Size (population served)	3% discount rate					7% discount rate				
	1989 TCR Total	RTCR Total	RTCR Net	Alternative option total	Alternative option net	1989 TCR total	RTCR total	RTCR net	Alternative option total	Alternative option net
	A	B	C = B − A	D	E = D − A	F	G	H = G − F	I	J = I − F
Community Water Systems (CWSs)										
≤100	7.4	7.5	0.1	7.6	0.2	7.1	7.3	0.2	7.5	0.3
101–500	9.0	9.4	0.4	9.5	0.5	8.6	9.1	0.5	9.2	0.6
501–1,000	3.7	3.8	0.0	3.8	0.1	3.6	3.7	0.1	3.7	0.1
1,001–4,100	13.2	13.6	0.4	13.6	0.4	12.7	13.1	0.4	13.1	0.4
4,101–33K	42.4	44.8	2.4	44.8	2.4	40.7	42.8	2.1	42.8	2.1
33,001–96K	34.9	36.4	1.5	36.4	1.5	33.5	34.8	1.3	34.8	1.3
96,001–500K	34.7	36.2	1.5	36.2	1.5	33.4	34.6	1.2	34.6	1.2
500,001–1M	6.5	6.7	0.2	6.7	0.2	6.2	6.4	0.1	6.4	0.1
>1M	5.6	5.6	(0.0)	5.6	(0.0)	5.3	5.3	(0.0)	5.3	(0.0)
Total	157.4	163.9	6.5	164.1	6.7	151.3	157.2	5.9	157.5	6.2
Nontransient Noncommunity Water Systems (NTNCWSs)										
≤100	2.6	2.7	0.1	3.7	1.1	2.5	2.7	0.2	3.8	1.4
101–500	1.9	2.0	0.1	2.8	0.9	1.8	2.0	0.2	2.9	1.1
501–1,000	0.6	0.6	0.1	0.9	0.3	0.6	0.6	0.1	0.9	0.3
1,001–4,100	1.2	1.3	0.1	1.3	0.1	1.1	1.2	0.1	1.2	0.1
4,101–33K	0.4	0.5	0.1	0.5	0.1	0.4	0.5	0.0	0.5	0.0
33,001–96K	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.0
96,001–500K	0.1	0.1	(0.0)	0.1	(0.0)	0.1	0.1	(0.0)	0.1	(0.0)
500,001–1M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>1M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6.9	7.3	0.4	9.3	2.5	6.6	7.2	0.6	9.6	3.0
Transient Noncommunity Water Systems(TNCWSs)										
≤100	13.4	18.7	5.3	28.1	14.7	12.8	18.2	5.3	28.9	16.1
101–500	4.9	6.5	1.6	9.5	4.7	4.7	6.3	1.6	9.8	5.1
501–1,000	0.6	0.8	0.2	1.2	0.5	0.6	0.8	0.2	1.2	0.6
1,001–4,100	0.9	1.0	0.1	1.0	0.1	0.9	1.0	0.1	1.0	0.1
4,101–33K	0.4	0.5	0.1	0.5	0.1	0.4	0.5	0.0	0.5	0.0
33,001–96K	0.1	0.1	(0.0)	0.1	(0.0)	0.1	0.1	(0.0)	0.1	(0.0)
96,001–500K	0.1	0.1	(0.0)	0.1	(0.0)	0.1	0.1	(0.0)	0.1	(0.0)
500,001–1M	0.2	0.2	(0.0)	0.2	(0.0)	0.2	0.2	(0.0)	0.2	(0.0)
>1M	0.3	0.3	0.0	0.3	0.0	0.3	0.3	0.0	0.3	0.0
Total	20.9	28.1	7.3	41.0	20.1	20.1	27.3	7.3	42.0	21.9
Grand Total	185.2	199.3	14.2	214.4	29.3	177.9	191.7	13.8	209.0	31.1

Note: Detail may not add due to independent rounding. Because only the incremental costs of some rule components are considered as part of the cost analysis, references to ''total'' costs in this exhibit do not refer to complete costs for regulatory implementation but only to specific costs considered to calculate net change in costs.

Source: RTCR cost model.

The following subsections discuss the different components of the costs to PWSs: Rule implementation and annual administration, sample siting plan revision, monitoring, annual site visits, assessments, corrective actions, and public notification.

a. Rule implementation and annual administration. Under the RTCR and Alternative option, all PWSs subject to the RTCR incur one-time costs that include time for staff to read the RTCR, become familiar with its provisions, and to train employees on rule requirements. No additional implementation burden or costs will be incurred by PWSs if the 1989 TCR option is maintained. Under the RTCR and Alternative option, all PWSs subject to the RTCR perform additional or transitional implementation activities. Based on previous experience with rule implementation, EPA estimated that

PWSs require a total of four hours to read and understand the rule, and a total of eight hours to plan and assign appropriate personnel and resources to carry out rule activities. EPA estimated a net increase in national annualized cost estimates incurred by PWSs for rule implementation and annual administration of $2.77M (three percent discount rate) and $4.00M (seven percent discount rate) under either the RTCR or the Alternative option. The annualized net present value total and net change cost estimates for PWSs for rule implementation and annual administration under the 1989 TCR, RTCR, and Alternative option are presented in Exhibit VI–16 of this preamble.

b. Sample siting plan revision. Under the RTCR and Alternative option, all PWSs subject to the RTCR incur one-time costs to revise existing sample siting plans to identify sampling locations and collection schedules that are representative of water throughout the distribution system. Under the 1989 TCR, no additional burden or costs are expected to be incurred by PWSs to revise sample siting plans, as these PWSs are already collecting total coliform samples in accordance with a written sample siting plan. Based on previous experience, EPA estimated that PWSs require two to eight hours to revise their sample siting plan, depending on PWS size. EPA estimated a net increase in national annualized cost estimates incurred by PWSs for revising sample siting plans of $0.59M (three percent discount rate) and $0.84M (seven percent discount rate) under either the RTCR or the Alternative option. The annualized net present value total and net change cost estimates for PWSs to revise their sample siting plan under the 1989 TCR, RTCR, and Alternative option are presented in Exhibit VI–16 of this preamble.

c. Monitoring. Monitoring costs for PWSs are calculated by multiplying the total numbers of routine, additional routine, and repeat samples required under the 1989 TCR, RTCR, and Alternative options by the monitoring costs per sample. Under the RTCR, the increased stringency to qualify for reduced monitoring results in more routine samples being taken over time (fewer PWSs are on reduced monitoring) compared to the 1989 TCR. For the Alternative option, this effect is combined with the requirement that all PWSs start the implementation period on monthly monitoring. The Alternative option also prohibits annual monitoring, resulting in a greater increase in the number of routine samples compared to the RTCR. Costs for routine monitoring under the RTCR and Alternative option are higher than routine monitoring costs under the 1989 TCR.

The overall reductions in the numbers of additional routine samples required under the RTCR and Alternative option result in lower costs for additional routine monitoring when compared to the 1989 TCR. Under the RTCR and Alternative option, additional routine monitoring is no longer required for systems that monitor at least monthly, and when additional routine monitoring is required, the number of samples required is reduced from five to three. Cost reductions are greater under the Alternative option than under the RTCR because under the Alternative option all PWSs start on monthly monitoring and are not required to take additional routine samples during that period.

Costs for repeat sampling are also lower under the RTCR and Alternative option. Under the 1989 TCR, PWSs serving 1,000 or fewer people take four repeat samples, at and within five service connections upstream and downstream of the initial total coliform positive occurrence location, over the course of 24 hours following the event. Under the RTCR and Alternative option, PWSs serving 1,000 or fewer people will need to take only three repeat samples, and they have greater flexibility about where to take them, consistent with the system sample siting plan that is developed in accordance with RTCR requirements and subject to review and revision by the State. The number of repeat samples required for PWSs serving more than 1,000 people is the same under the 1989 TCR and the RTCR and Alternative option, although these systems also have greater flexibility in sample location.

Exhibit VI–18 summarizes the cumulative number of samples taken by PWS size and category for routine, additional, and repeat monitoring under the 1989 TCR, RTCR, and Alternative option over the entire 25-year period of analysis. Under the 1989 TCR option, approximately 82.1M samples are taken over the 25-year period of analysis compared to approximately 82.2M samples under the RTCR and approximately 87.9M samples under the Alternative option (less than 10 percent more than 1989 TCR option). Appendix A of the RTCR EA presents additional information on the number of samples taken each year during the analysis period.

EXHIBIT VI–18—CUMULATIVE NUMBER OF SAMPLES OVER 25-YEAR PERIOD OF ANALYSIS FOR BASELINE (1989 TCR) AND REGULATORY ALTERNATIVES

[RTCR and Alternative option]

PWS Size (population served)	1989 TCR			RTCR			Alternative		
	Routine monitoring samples	Additional routine monitoring samples	Repeat monitoring samples	Routine monitoring samples	Additional routine monitoring samples	Repeat monitoring samples	Routine monitoring samples	Additional routine monitoring samples	Repeat monitoring samples
	A	B	C	D	E	F	G	H	I
Community Water Systems (CWSs)—Surface Water									
≤100	304,247	23,167	18,698	308,880	.....	13,764	308,880	.....	13,764
101–500	562,198	27,009	21,684	567,600	.....	15,660	567,600	.....	15,660
501–1,000	306,605	15,334	12,299	309,672	.....	8,708	309,672	.....	8,708
1,001–4,100	1,921,237	55,132	33,729	1,951,224	.....	33,326	1,951,224	.....	33,326
4,101–33K	10,636,296	.....	186,729	10,636,296	.....	181,661	10,636,296	.....	181,661
33,001–96K	11,058,960	.....	194,149	11,058,960	.....	188,880	11,058,960	.....	188,880
96,001–500K	10,190,400	.....	178,901	10,190,400	.....	174,046	10,190,400	.....	174,046
500,001–1M	2,019,600	.....	35,456	2,019,600	.....	34,493	2,019,600	.....	34,493
>1M	1,686,960	.....	29,616	1,686,960	.....	28,812	1,686,960	.....	28,812
Total	38,686,502	120,642	711,259	38,729,592	.....	679,350	38,729,592	.....	679,350

EXHIBIT VI–18—CUMULATIVE NUMBER OF SAMPLES OVER 25-YEAR PERIOD OF ANALYSIS FOR BASELINE (1989 TCR) AND REGULATORY ALTERNATIVES—Continued

[RTCR and Alternative option]

PWS Size (population served)	1989 TCR			RTCR			Alternative		
	Routine monitoring samples	Additional routine monitoring samples	Repeat monitoring samples	Routine monitoring samples	Additional routine monitoring samples	Repeat monitoring samples	Routine monitoring samples	Additional routine monitoring samples	Repeat monitoring samples
	A	B	C	D	E	F	G	H	I
Community Water Systems (CWSs)—Ground Water									
≤100	2,815,951	286,073	194,462	2,870,075	8,760	156,897	2,908,469	7,545	158,439
101–500	3,344,578	243,895	171,252	3,391,200	6,127	136,906	3,428,876	5,264	137,959
501–1,000	1,072,202	70,803	51,673	1,085,730	1,844	39,659	1,098,488	1,616	39,580
1,001–4,100	3,997,293	160,710	100,618	4,079,328	.....	96,939	4,079,328	.....	96,939
4,101–33K	9,145,224	.....	230,201	9,145,224	.....	217,321	9,145,224	.....	217,321
33,001–96K	4,884,000	.....	122,938	4,884,000	.....	116,060	4,884,000	.....	116,060
96,001–500K	1,945,680	.....	48,976	1,945,680	.....	46,236	1,945,680	.....	46,236
500,001–1M	253,440	.....	6,380	253,440	.....	6,023	253,440	.....	6,023
>1M	269,280	.....	6,778	269,280	.....	6,399	269,280	.....	6,399
Total	27,727,648	761,481	933,279	27,923,956	16,731	822,439	28,012,784	14,425	824,956
Nontransient Noncommunity Water Systems (NTNCWSs)—Surface Water									
≤100	65,018	4,910	3,991	66,000	.....	3,040	66,000	.....	3,040
101–500	66,045	3,735	3,011	66,792	.....	2,169	66,792	.....	2,169
501–1,000	22,976	1,278	1,029	23,232	.....	756	23,232	.....	756
1,001–4,100	41,759	2,142	1,348	42,768	.....	1,228	42,768	.....	1,228
4,101–33K	50,424	.....	1,628	50,424	.....	1,448	50,424	.....	1,448
33,001–96K	34,320	.....	1,108	34,320	.....	985	34,320	.....	985
96,001–500K	31,680	.....	1,023	31,680	.....	910	31,680	.....	910
500,001–1M	.....	.....	.....	.....	.....	.....	.....	.....	.....
>1M	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	312,223	12,065	13,138	315,216	.....	10,536	315,216	.....	10,536
Nontransient Noncommunity Water Systems (NTNCWSs)—Ground Water									
≤100	971,538	128,775	84,992	932,025	48,142	68,123	1,314,175	36,965	91,416
101–500	725,785	66,525	43,597	678,688	25,630	35,860	976,627	19,382	48,269
501–1,000	190,649	16,037	10,680	180,145	6,166	8,601	249,760	4,802	11,817
1,001–4,100	460,470	28,214	17,790	473,352	.....	15,887	473,352	.....	15,887
4,101–33K	153,648	.....	5,936	153,648	.....	5,157	153,648	.....	5,157
33,001–96K	23,760	.....	918	23,760	.....	797	23,760	.....	797
96,001–500K	.....	.....	.....	.....	.....	.....	.....	.....	.....
500,001–1M	.....	.....	.....	.....	.....	.....	.....	.....	.....
>1M	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	2,525,850	239,551	163,913	2,441,617	79,938	134,426	3,191,322	61,149	173,343
Transient Noncommunity Water Systems (TNCWSs)—Surface Water									
≤100	345,401	40,475	33,065	353,496	.....	23,122	353,496	.....	23,122
101–500	128,156	15,261	12,454	131,208	.....	8,192	131,208	.....	8,192
501–1,000	22,691	2,704	2,207	23,232	.....	1,533	23,232	.....	1,533
1,001–4,100	40,151	4,155	2,707	42,240	.....	2,312	42,240	.....	2,312
4,101–33K	40,656	.....	.....	40,656	.....	2,225	40,656	.....	2,225
33,001–96K	.....	.....	.....	.....	.....	.....	.....	.....	.....
96,001–500K	.....	.....	.....	.....	.....	.....	.....	.....	.....
500,001–1M	.....	.....	.....	.....	.....	.....	.....	.....	.....
>1M	102,960	.....	.....	102,960	.....	5,636	102,960	.....	5,636
Total	680,015	62,596	50,434	693,792	.....	43,020	693,792	.....	43,020
Transient Noncommunity Water Systems (TNCWSs)—Ground Water									
≤100	4,493,808	905,554	600,315	6,076,163	446,166	631,105	9,524,123	333,524	912,589
101–500	1,614,924	316,238	210,714	1,940,946	135,822	194,697	3,021,771	104,732	282,740
501–1,000	177,264	32,730	22,064	206,130	14,078	20,078	304,534	10,412	27,932
1,001–4,100	335,283	29,957	19,113	348,480	.....	16,027	348,480	.....	16,027
4,101–33K	156,288	.....	8,909	156,288	.....	7,188	156,288	.....	7,188
33,001–96K	34,320	.....	1,956	34,320	.....	1,578	34,320	.....	1,578
96,001–500K	26,400	.....	1,505	26,400	.....	1,214	26,400	.....	1,214
500,001–1M	63,360	.....	3,612	63,360	.....	2,914	63,360	.....	2,914
>1M	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	6,901,647	1,284,478	868,188	8,852,088	596,065	874,801	13,479,275	448,667	1,252,181
Grand Total	76,833,885	2,480,814	2,740,210	78,956,260	692,734	2,564,572	84,421,981	524,241	2,983,387

Note: (B), (E), (H) For modeling purposed, additional routine sample counts include regular routine samples taken in the same month.
Source: Appendix A of the RTCR EA (USEPA 2012a)—Total PWS Counts (A.1z, A.2z, A.3z).

The annualized total and net change cost estimates for PWSs to perform monitoring under the 1989 TCR, RTCR, and Alternative option are presented in Exhibit VI–19. EPA estimated a net increase in national annualized cost estimates incurred by PWSs for monitoring of $1.14M (three percent discount rate) and $0.95M (seven percent discount rate) under the RTCR and a net increase of $14.36M (three percent discount rate) and $16.15M (seven percent discount rate) under the Alternative option. See also Exhibit VI–16 of this preamble for a breakdown on the costs of monitoring (i.e., routine, additional routine, repeat).

EXHIBIT VI–19—ANNUALIZED NATIONAL PWS MONITORING COST ESTIMATES

[$Millions, 2007$]

	3% discount rate	7% discount rate
1989 TCR—Total	$179.57	$172.57
RTCR—Total	$180.71	$173.52
RTCR—Net Change	$1.14	$0.95
RTCR—Percent Change	0.63%	0.55%
Alternative option—Total	$193.93	$188.72
Alternative option—Net Change	$14.36	$16.15
Alternative option—Percent Change	7.99%	9.36%

Note: Detail may not add due to independent rounding.
Source: RTCR EA (USEPA 2012a).

The overall estimated increase in monitoring costs seen under the RTCR is driven by increases in routine monitoring due to stricter requirements to qualify for reduced monitoring. However, this is mostly offset by reductions in additional routine and repeat monitoring. For the Alternative option, the requirement for all PWSs to sample on a monthly basis at the beginning of rule implementation results in a much larger cost differential that is only partially offset by reduced costs from reductions in additional routine monitoring requirements.

d. Annual site visits. Under the RTCR, any PWS on an annual monitoring schedule is required to also have an annual site visit conducted by the State or State-designated third party. A voluntary Level 2 site assessment can also satisfy the annual site visit requirement. For years in which the State performs a sanitary survey (at least every five years for NCWSs and three years for CWSs), a sanitary survey performed during the same year can also be used to satisfy this requirement. Although similar site visits are not currently required under the 1989 TCR, discussions with States during the TCRDSAC proceedings revealed that some do, in fact, conduct such site visits for PWSs on annual monitoring schedules. Because of the high cost for an annual site visit by a State, for this analysis EPA assumed that no States choose to conduct annual site visits unless they already do so under the 1989 TCR. Therefore, for overall costing purposes, no net change in PWS or State costs are assumed for annual monitoring site visits under the RTCR or Alternative option.

e. Assessments. Annualized cost estimates for Level 1 and Level 2 assessments under the 1989 TCR, RTCR, and Alternative option are calculated in the RTCR EA by multiplying the number of assessments estimated by the predictive modeling (summarized in Exhibit 7.13 of the EA) by the unit costs (summarized in Exhibits 7–11 and 7–12 of the EA). Appendix A of the RTCR EA provides a detailed breakout of the number of Level 1 and Level 2 assessments estimated by the occurrence model. EPA estimated a net increase in national annualized cost estimates incurred by PWSs for conducting assessment of $0.70M (three percent discount rate) and $0.69M (seven percent discount rate) under the RTCR and a net increase of $1.18M (three percent discount rate) and $1.25M (seven percent discount rate) under the Alternative option. Annualized cost estimates are presented in Exhibit VI–16 of this preamble.

Under the RTCR, all PWSs are required to conduct assessments of their systems when they exceed Level 1 or Level 2 treatment technique triggers. While PWSs are not required to conduct assessments under the 1989 TCR, some PWSs do currently engage in assessment activity (which may or may not meet the RTCR criteria) following non-acute and acute MCL violations. EPA estimates both the costs to PWSs to conduct assessments under the RTCR as well as the level of effort that PWSs already put toward assessment activities under the 1989 TCR. These estimates are based on the work of the stakeholders in the Technical Work Group (TWG) during the proceedings of the TCRDSAC. These estimates allowed EPA to determine the average net costs to conduct assessments under the RTCR. EPA assumes that the numbers of non-acute and acute MCL violations would remain steady under a continuation of the 1989 TCR based on the review of SDWIS/FED violation data. Under the RTCR, EPA assumes that the numbers of assessment triggers decrease over time from the steady state level estimate based on the 1989 TCR to a new steady state level, as a result of reduced fecal indicator occurrence associated with the beneficial effects of requiring assessments and corrective action.

The overall number of assessments is larger under the Alternative option compared to the RTCR option. This is a result of the initial monthly monitoring requirements for all PWSs under the Alternative option. The modeling results indicate that a greater number of samples early in the implementation period results in more positive samples and associated assessments despite the predicted long term reductions in occurrence as informed by the assumptions. This increase in total assessments performed, combined with the higher unit cost of performing assessments compared to existing practices under the 1989 TCR, results in a higher net cost increase for the Alternative option than under the RTCR. The total net increase in cost for the Alternative option is estimated to be nearly twice that of the RTCR option. See Exhibit 7.15 of the RTCR EA.

f. Corrective actions. Under the RTCR and Alternative option, all PWSs are required to correct sanitary defects found through the performance of Level 1 or Level 2 assessments. For modeling purposes, EPA estimated the net change in the number of corrective actions performed under the RTCR and Alternative option. For ground water systems, EPA assumed that any corrective actions based on a positive source water sample are accounted for

under the GWR and not under the RTCR. Based on discussions with State representatives, EPA assumed that an additional 10 percent of corrective actions will be performed as a result of the assessment and corrective action requirements of the RTCR, representing the net increase of the RTCR over the 1989 TCR.

To estimate the costs incurred for the correction of sanitary defects, EPA assumed the percent distribution of PWSs that perform different types of corrective actions as presented in the compliance forecast shown in Exhibit VI–20 (i.e., distribution of the additional 10 percent of corrective actions) based on best professional judgment and stakeholder input. The compliance forecast presented in this section was informed by discussions of the TCRDSAC Technical Work Group and focuses on broad categories of types of corrective actions anticipated. EPA used best professional judgment and stakeholder input to make simplifying assumptions on the distribution of these categories that are implemented by different systems based on size and type of system. For each of the categories listed, a PWS is assumed to take a specific action that falls under that general category. Detailed compliance forecasts showing the specific corrective actions used in the cost analysis are provided in Appendix D of the RTCR EA, along with summary tables of the unit costs used in the analysis. Each corrective action in the detailed compliance forecast is also assigned a representative unit cost. Detailed descriptions of the derivation of unit costs are provided in Exhibits 5–1 through 5–47 of the *Technology and Cost Document for the Revised Total Coliform Rule* (USEPA 2012b).

EXHIBIT VI–20—COMPLIANCE FORECAST FOR CORRECTIVE ACTIONS BASED ON LEVEL 1 AND LEVEL 2 ASSESSMENTS

PWS Size (population served) (percent)	PWS flushing (percent)	Sampler training (percent)	Replace/ Repair of distribution system components (percent)	Maintenance of adequate pressure (percent)	Maintenance of appropriate hydraulic residence time (percent)	Storage facility maintenance (percent)	Booster disinfection (percent)	Cross-connection control and backflow prevention (percent)	Addition or upgrade of online monitoring and control (percent)	Addition of security measures (percent)	Development and implementation of an operations plan (percent)
	A	B	C	D	E	F	G	H	I	J	K
Level 1 Compliance Forecast											
≤100	39	15	12	9	8	6	4	1	3	1	2
101–500	39	15	12	9	8	6	4	1	3	1	2
501–1,000	39	15	12	9	8	6	4	1	3	1	2
1,001–4,100	39	15	12	9	8	6	4	1	3	1	2
4,101–33K	39	15	12	9	8	6	4	1	3	1	2
33,001–96K	39	15	12	9	8	6	4	1	3	1	2
96,001–500K	39	15	12	9	8	6	4	1	3	1	2
500,001–1M	39	15	12	9	8	6	4	1	3	1	2
>1M	39	15	12	9	8	6	4	1	3	1	2
Level 2 Compliance Forecast											
≤100	15	4	18	15	15	11	8	2	6	2	4
101–500	15	4	18	15	15	11	8	2	6	2	4
501–1,000	15	4	18	15	15	11	8	2	6	2	4
1,001–4,100	15	4	18	15	15	11	8	2	6	2	4
4,101–33K	15	4	18	15	15	11	8	2	6	2	4
33,001–96K	15	4	18	15	15	11	8	2	6	2	4
96,001–500K	15	4	18	15	15	11	8	2	6	2	4
500,001–1M	15	4	18	15	15	11	8	2	6	2	4
>1M	15	4	18	15	15	11	8	2	6	2	4

Source: (A)–(K) Percent of PWSs performing corrective actions based on Level 1 and Level 2 assessments reflect EPA estimates.

Level 1 assessments generally are less involved than Level 2 assessments and may result in finding less complex problems. As shown in the compliance forecast in Exhibit VI–20, EPA estimated that corrective actions found through Level 1 assessments result in corrective actions that focus more on transient solutions or training (columns A and B) than on permanent fixes to the PWS. However, in the case of flushing, EPA assumed that in a majority of instances, PWSs implement a regular flushing program as opposed to a single flushing, based on EPA and stakeholder best professional judgment.

Corrective actions taken as a result of Level 2 assessments are expected to find a higher proportion of structural/technical issues (columns C–K) resulting in material fixes to the PWSs and distribution system. Consistent with the discussions of the TCRDSAC regarding major structural fixes or replacements, EPA did not include these major costs in the analysis. Distribution system appurtenances such as storage tanks and water mains generally have a useful life that is accounted for in water system capital planning. The assessments conducted in response to RTCR triggers could identify when that useful life has ended but are not solely responsible for the need to correct the defect. In addition, EPA ran two sensitivity analyses to assess the potential impacts of different distributions within the compliance forecast. Results of the sensitivity analyses are presented in Exhibit VI–21, which indicates that the low bound estimates of annualized net change in costs at three percent discount rate are approximately $3M for the RTCR and $17M for the Alternative option, and the high bound estimates are approximately $25M for the RTCR and $43M for the Alternative option. Varying the assumptions about the percentage of corrective actions identified and the effectiveness of those actions had less than a linear effect on outcomes, and the RTCR continues to be less costly than the Alternative option under all scenarios modeled.

EXHIBIT VI–21—SENSITIVITY ANALYSIS—ANNUALIZED NET CHANGE IN COSTS BASED ON CHANGES IN COMPLIANCE FORECAST ($MILLIONS, 2007$)

	3% discount rate			7% discount rate		
	PWSs	State	Total	PWSs	State	Total
RTCR Net Change	14.15	0.15	14.30	13.75	0.42	14.17
RTCR Low Bound Net Change	2.61	0.15	2.75	3.91	0.42	4.33
RTCR High Bound Net Change	25.10	0.15	25.25	23.63	0.42	24.05
Alternative Option Net Change	29.29	0.31	29.60	31.09	0.61	31.69
Alternative Option Low Bound Net Change	16.54	0.31	16.84	19.93	0.61	20.54
Alternative Option High Bound Net Change	42.68	0.31	42.99	43.63	0.61	44.24

Note: Detail may not add due to independent rounding.
Source: RTCR cost model, described in chapter 7 of the RTCR EA (USEPA 2012a).

As indicated in the more detailed analysis presented in chapter 7 of the RTCR EA, PWSs also incur reporting and recordkeeping burden to notify the State upon completion of each corrective action. PWSs may also consult with the State or with outside parties to determine the appropriate corrective action to be implemented.

Annualized cost estimates for PWSs to perform corrective actions are estimated by multiplying the number of Level 1 and Level 2 corrective actions estimated by the predictive model, (i.e., 10 percent of Level 1 and Level 2 assessments) by the percentages in the compliance forecast and unit costs of corrective actions and associated reporting and recordkeeping. Exhibit 7.13 of the RTCR EA presents the estimated totals of non-acute and acute MCL violations (1989 TCR) and Level 1 and Level 2 assessments (RTCR and Alternative option). The model predicts a total of approximately 109,000 single non-acute MCL violations, 58,000 cases of a second non-acute MCL violation, and 16,000 acute MCL violations for the 1989 TCR, under which some PWSs currently engage in assessment activity which may or may not meet the RTCR criteria (see section 7.4.5 of the RTCR EA for details). For the RTCR, the model predicts approximately 104,000 Level 1 assessments and 52,000 Level 2 assessments. For the Alternative option, the model predicts approximately 120,000 Level 1 assessments and 81,000 Level 2 assessments. EPA estimated a net increase in national annualized cost estimates incurred by PWSs for conducting corrective actions of $12.44M (three percent discount rate) and $10.63M (seven percent discount rate) under the RTCR and a net increase of $13.79M (three percent discount rate) and $12.09M (seven percent discount rate) under the Alternative option. The annualized net present value total and net change cost estimates for PWSs to perform corrective actions under the 1989 TCR, RTCR, and Alternative option are presented in Exhibit VI–16 of this preamble.

The differences in the net change in corrective action costs between the RTCR and Alternative option are a function of the different number of assessments estimated to be performed in the predictive model.

g. Public notification. Estimates of PWS unit costs for PN are derived by multiplying PWS labor rates from section 7.2.1 of the RTCR EA and burden hour estimates derived from the *Draft Information Collection Request for the Public Water System Supervision Program* (USEPA 2008b). PWS PN unit cost estimates are presented in Exhibit 7.19 of the RTCR EA.

Total and net change in annualized costs for PN under the RTCR and Alternative option are estimated by multiplying the model estimates of PWSs with acute (Tier 1 public notification) and non-acute (Tier 2 public notification) violations by the PWS unit costs for performing PN activities. The RTCR cost model assumed that all violations are addressed following initial PN, and no burden is incurred by PWSs for repeat notification. EPA estimated a net decrease in national annualized cost estimates incurred by PWSs for public notification of $3.49M (three percent discount rate) and $3.35M (seven percent discount rate) under the RTCR and a net decrease of $3.40M (three percent discount rate) and $3.25M (seven percent discount rate) under the Alternative option. The annualized total and net cost estimates for PWSs to perform public notification under the 1989 TCR, RTCR, and Alternative option are presented in Exhibit VI–16 of this preamble.

A significant reduction in costs is estimated due to the elimination of Tier 2 public notification for non-acute/monthly MCL violations under both the RTCR and Alternative option.

3. State Costs

EPA estimated that States as a group incur a net increase in national annualized present value costs under the RTCR of $0.2M (at three percent discount rate) and $0.4M (at seven percent discount rate) and under the Alternative option of $0.3M (at three percent discount rate) and $0.6M (at seven percent discount rate). State costs include implementing and administering the rule, revising sample siting plans, reviewing sampling results, conducting annual site visits, reviewing completed assessment forms, tracking corrective actions, and tracking public notifications. The costs presented in the RTCR EA are summary costs; costs to individual states vary based on state programs and the number and types of systems in the state. The following sections summarize the key assumptions that EPA made to estimate the costs of the RTCR and Alternative option to States. Chapter 7 of the RTCR EA provides a description of the analysis.

a. Rule implementation and annual administration. States incur administrative costs to implement the RTCR. These implementation costs are not directly required by specific provisions of the RTCR alternatives, but are necessary for States to ensure the provisions of the RTCR are properly carried out. States need to allocate time for their staff to establish and maintain the programs necessary to comply with the RTCR, including developing and adopting State regulations and modifying data management systems to track new required PWS reports to the States. Time requirements for a variety of State agency activities and responses are estimated in this EA. Exhibit 7.4 of the RTCR EA lists the activities required to revise the program following promulgation of the RTCR along with their respective costs and burden including, for example, the net change

in State burden associated with tracking the monitoring frequencies of PWSs (captured under ''modify data management systems''). EPA estimated a net increase in national annualized cost estimates incurred by States for rule implementation of $0.18M (three percent discount rate) and $0.26M (seven percent discount rate) under either the RTCR or the Alternative option. Because time requirements for implementation and annual administration activities vary among State agencies, EPA recognizes that the unit costs used to develop national estimates may be an over- or under-estimate for some States. The annualized total and net change cost estimates for States to implement and administer the rule under the 1989 TCR, RTCR, and Alternative options are presented in Exhibit VI–16 of this preamble.

b. Sample siting plan revision. Under the RTCR and Alternative option, States are expected to incur one-time costs to review sample siting plans and recommend any revisions to PWSs. Under the 1989 TCR option, no additional burden or costs are incurred by States to review sample siting plans, as these PWSs' sample siting plans have already been reviewed and approved. State costs are based on the number of PWSs developing revised sample siting plans each year. Based on previous experience, EPA estimated that States require one to four hours to review revised sample siting plans and provide any necessary revisions to PWSs, depending on PWS size. EPA estimated a net increase in national annualized cost estimates incurred by States for reviewing sample siting plans of $0.42M (three percent discount rate) and $0.59M (seven percent discount rate) under either the RTCR or the Alternative option. The annualized net present value total and net change cost estimates for States to review and revise sample siting plan under the 1989 TCR, RTCR, and Alternative option are presented in Exhibit VI–16 of this preamble.

c. Monitoring. EPA assumed that States incur a monthly 15-minute burden to review each PWS's sample results under the 1989 TCR. This estimate reflects the method used to calculate reporting and recordkeeping burden under the 1989 TCR in the *Draft Information Collection Request for the Microbial Rules* (USEPA 2008a). Because the existing method calculates cost on a per PWS basis and the total number of PWSs is the same for cost modeling under the 1989 TCR and the RTCR and Alternative option, the net change in costs for reviewing monitoring results is assumed to be zero for the RTCR and Alternative option (as shown in Exhibit VI–16 of this preamble). Specific actions by States related to positive samples are accounted for under the actions required in response to those samples.

d. Annual site visits. Under the RTCR, any PWS on an annual monitoring schedule is required to also have an annual site visit conducted by the State or State-designated third party. A voluntary Level 2 site assessment can also satisfy the annual site visit requirement. In many cases a sanitary survey performed during the same year can also be used to satisfy this requirement. Although similar site visits are not currently required under the 1989 TCR, discussions with States during the TCRDSAC proceedings revealed that some do, in fact, conduct such site visits for PWSs on annual monitoring schedules. Because of the high cost for an annual site visit by a State, for this analysis EPA assumed that no States choose to conduct annual site visits unless they already do so under the 1989 TCR. Therefore, for overall costing purposes, no net change in State or PWS costs are assumed for annual monitoring site visits under the RTCR or Alternative option (as shown in Exhibit VI–16 of this preamble).

e. Assessments. States incur burden to review completed Level 1 and Level 2 assessment forms required to be filed by PWSs under the RTCR and Alternative option. Although specific forms are not required under the 1989 TCR, EPA assumes that PWSs engage in some form of consultation with the State when they have positive sample results and MCL violations. For costing purposes, EPA assumes that the level of effort required for such consultations under the 1989 TCR is the same as that which would be required for consultations that occur when an assessment is conducted under the RTCR and Alternative option. State costs for the RTCR and Alternative option are based on the number of PWSs submitting assessment reports. EPA estimated that State burden to review PWS assessment forms ranges from one to eight hours depending on PWS size and type and the level of the assessment. This burden includes any time required to consult with the PWS about the assessment report.

Although some States may choose to conduct assessments for their PWSs, EPA does not quantify these costs. The costs are attributed to PWSs that are responsible for ensuring that assessments are done.

As explained in chapter 7 of the RTCR EA, EPA assumes a certain level of assessment activity already occurs under the 1989 TCR based on discussions with the technical workgroup supporting the advisory committee. Under the RTCR, the overall number of Level 1 and Level 2 assessment triggers decreases compared to the 1989 TCR as a function of reduced occurrence over time. This reduction in assessments under the RTCR is estimated to translate directly to a small national cost savings ($0.08M at either three or seven percent discount rate) for States. The overall number of Level 1 and Level 2 assessments is higher under the Alternative option as a result of the initial monthly monitoring requirements for all PWSs. The increase in the number of assessments under the Alternative option is estimated to translate directly to a national cost increase ($0.05M at three percent discount rate and $0.08M at seven percent discount rate) for States. The annualized net present value total and net change cost estimates for States to review completed Level 1 and Level 2 assessment forms under the 1989 TCR, RTCR, and Alternative option are presented in Exhibit VI–16 of this preamble.

f. Corrective actions. For each corrective action performed under the RTCR and Alternative option, States incur recordkeeping and reporting burden to review assessment forms and coordinate with PWSs. This includes burden incurred from any optional consultations States may conduct with PWSs or outside parties to determine the appropriate corrective action to be implemented. There are no State costs for corrective action under the 1989 TCR because corrective action is not required under the 1989 TCR. The number of corrective actions under the RTCR is estimated to translate to a national net annualized cost increase to States of $0.01M at either three or seven percent discount rate. The number of corrective actions under the Alternative option is estimated to translate to a national net annualized cost increase to States of $0.02M at either three or seven percent discount rate. See Exhibit VI–16 of this preamble.

g. Public notification. Under the 1989 TCR, RTCR, and Alternative option, States incur recordkeeping and reporting burden to provide consultation, review the public notification certification, and file the report of the violation. A significant reduction in costs is estimated due to the elimination of Tier 2 public notification for non-acute MCL violations under the RTCR and Alternative option. Because State costs are calculated on a per-violation basis, State costs decline. Under the

Alternative option, some of the decrease in cost is offset by additional Tier 1 public notification from the increase in the number of *E. coli* MCL violations detected. Burden hour estimate for State unit PN costs are derived from the *Draft Information Collection Request for the Public Water System Supervision Program* (USEPA 2008b). EPA estimated a net decrease in national annualized cost estimates incurred by States for public notification of $0.38M (three percent discount rate) and $0.36M (seven percent discount rate) under the RTCR and a net decrease of $0.36M (three percent discount rate) and $0.34M (seven percent discount rate) under the Alternative option. The annualized net present value total and net change cost estimates for States to track public notifications under the 1989 TCR, RTCR, and Alternative option are presented in Exhibit VI–16 of this preamble.

4. Nonquantifiable Costs

EPA believes that all of the rule elements that are the major drivers of the net change in costs from the 1989 TCR have been quantified to the greatest degree possible. However, cost reductions related to fewer monitoring and reporting violations are not specifically accounted for in the cost analysis, and their exclusion from consideration may result in an overestimate of the net increase in cost between the 1989 TCR option and the RTCR or Alternative option.

Furthermore, under the 1989 TCR, RTCR, and Alternative option, Tier 3 public notification for monitoring and reporting violations are assumed to be reported once per year as part of the Consumer Confidence Reports (CCRs). Because of the use of the CCR to communicate Tier 3 public notification on a yearly basis, no cost differential between the current 1989 TCR and the RTCR and Alternative option is estimated in the cost model. However, the advisory committee concluded that significant reductions in monitoring and reporting violations may be realized through the revised regulatory framework of the RTCR, which includes new consequences for failing to comply with monitoring provisions such as the requirement to conduct an assessment or ineligibility for reduced monitoring. These possible reductions have not been quantified. System resources used to process monitoring violation notices for the CCR and respond to customer inquiries about the notices, as well as State resources to remind systems to take samples, may be reduced if significant reductions in monitoring and reporting violations are realized. Exclusion of this potential cost savings may lead to an underestimate of the PN cost savings under both the RTCR and Alternative option.

Additionally, as an underlying assumption to the costing methodology, EPA assumed that all PWSs subject to the RTCR requirements are already complying with the 1989 TCR. There may be some PWSs that are not in full compliance with the 1989 TCR, and if so, additional costs and benefits may be incurred. EPA does not anticipate non-compliance when performing economic analyses for NPDWRs, therefore those costs and benefits are not captured in this analysis.

G. Potential Impact of the RTCR on Households

The household cost analysis considers the potential increase in a household's annual water bill if a CWS passed the entire cost increase resulting from the rule on to their customers. This analysis is a tool to gauge potential impacts and should not be construed as a precise estimate of potential changes to household water bills. State costs and costs to TNCWSs and NTNCWSs are not included in this analysis since their costs are not typically passed through directly to households. Exhibit VI–22 presents the mean expected increases in annual household costs for all CWSs, including those systems that do not have to take corrective action. Exhibit VI–22 also presents the same information for CWSs that must take corrective action. Household costs tend to decrease as system size increases, due mainly to the economies of scale for the corrective actions.

Exhibit VI–22 presents net costs per household under the RTCR and Alternative option for all rule components spread across all CWSs. Comparison to the 1989 TCR shows a cost savings for some households. The average annual water bill is expected to increase by six cents or less on average per year.

While the average increase in annual household water bills to implement the RTCR is well less than a dollar, customers served by a small CWS that have to take corrective actions as a result of the rule incur slightly larger increases in their water bills. The subsequent categories of the exhibit present net costs per household for three different subsets of CWSs: (1) CWSs that perform assessments but no corrective actions, (2) CWSs that perform corrective actions, and (3) CWSs that do not perform assessments or corrective actions. Approximately 67 percent of households are served by CWSs that perform assessments but do not perform corrective actions over the 25-year period of analysis (because no sanitary defects are found). These households experience a slight cost savings on an annual basis, due to a slight reduction in monitoring and public notification costs. The nine percent of households belonging to CWSs that perform corrective actions over the 25-year period of analysis experience an increase in annual net household costs of less than $0.70 on average for CWSs serving greater than 4,100 people to approximately $4.50 on average for CWSs serving 4,100 or fewer people on an annual basis. EPA estimated that 24 percent of households are served by CWSs that do not perform assessments or corrective actions over the 25-year period of analysis because they never exceed an assessment trigger. This group of households served by small systems (4,100 or fewer people) experiences a slight cost change on an annual basis, comparable to those performing assessments but no corrective actions. Overall, the main driver of additional household costs under the RTCR is corrective actions.

EXHIBIT VI–22—SUMMARY OF NET ANNUAL PER-HOUSEHOLD COSTS FOR THE RTCR

[2007$]

Population served by PWS	3% discount rate		7% discount rate	
	RTCR Net cost per household	Alternative option net cost per household	RTCR Net cost per household	Alternative option net cost per household
All Community Water Systems (CWSs)				
≤4,100	0.08	0.10	0.11	0.13

EXHIBIT VI–22—SUMMARY OF NET ANNUAL PER-HOUSEHOLD COSTS FOR THE RTCR—Continued

[2007$]

Population served by PWS	3% discount rate		7% discount rate	
	RTCR Net cost per household	Alternative option net cost per household	RTCR Net cost per household	Alternative option net cost per household
>4,100	0.05	0.05	0.05	0.05
Total	0.06	0.06	0.05	0.05
Community Water Systems (CWSs) performing Level 1/Level 2 Assessments (and no Corrective Actions)				
≤4,100	(0.22)	(0.19)	(0.16)	(0.13)
>4,100	(0.01)	(0.01)	(0.01)	(0.01)
Total	(0.02)	(0.02)	(0.01)	(0.01)
Community Water Systems (CWSs) performing Corrective Actions				
≤4,100	4.47	4.51	3.93	3.98
>4,100	0.66	0.66	0.55	0.55
Total	0.80	0.80	0.68	0.68
Community Water Systems (CWSs) not performing Level 1/Level 2 Assessments, or Corrective Actions				
≤4,100	(0.00)	0.02	0.04	0.06
>4,100	.....	.....	.....	.....
Total	(0.00)	0.00	0.01	0.02

Source: RTCR EA (USEPA 2012a).

H. Incremental Costs and Benefits

The RTCR regulatory options achieve increasing levels of benefits at increasing levels of costs. The regulatory options for this rule, in order of increasing costs and benefits (Option 1 lowest and Option 3 highest) are as follows:

- Option 1: 1989 TCR option
- Option 2: RTCR
- Option 3: Alternative option

Incremental costs and benefits are those that are incurred or realized to reduce potential illnesses and deaths from one alternative to the next more stringent alternative. Estimates of incremental costs and benefits are useful when considering the economic efficiency of different regulatory alternatives considered by EPA. One goal of an incremental analysis is to identify the regulatory alternatives where net social benefits are maximized. However, incremental net benefits analysis is not possible when benefits are discussed qualitatively and are not monetized, as is the case with the RTCR.

However, incremental analysis can still provide information on relative cost-effectiveness of different regulatory options. For the RTCR, only costs were monetized. While benefits were not quantified, an indirect proxy for benefits was quantified. To compare the additional net cost increases and associated incremental benefits of the RTCR and the Alternative option, benefits are presented in terms of corrective actions performed since performance of corrective actions is expected to have the impact that is most directly translatable into potential health benefits.

Exhibit VI–23 shows the incremental cost of the RTCR over the 1989 TCR and the Alternative option over the RTCR for costs annualized using three percent and seven percent discount rates. The non-monetized corrective action endpoints are discounted in order to make them comparable to monetized endpoints. The relationship between the incremental costs and benefits is examined further with respect to cost effectiveness in section VI.M of this preamble, *Benefit Cost Determination for the RTCR.*

EXHIBIT VI—23 INCREMENTAL NET CHANGE IN ANNUALIZED COSTS ($MILLIONS, 2007$) AND BENEFITS

[Number of Corrective Actions]

Regulatory option	Costs ($millions)		Benefits (L2 corrective actions)	
	3%	7%	3%	7%
1989 TCR	186.1	178.8	No change [3]	No change [3]
RTCR	200.4	193.0	208	202
Incremental RTCR [1]	14.3	14.2	208	202
Alternative Option	215.7	210.5	336	355
Incremental Alternative Option [2]	15.3	17.5	128	153

[1] Represents the incremental net change of the RTCR over the 1989 TCR option.

[2] Represents the incremental net change of the Alternative option over the RTCR. Add incremental net change for Alternative option to incremental net change for RTCR to calculate the total net change of the Alternative option over the 1989 TCR option.

Note: The RTCR occurrence model yields the number of corrective actions that are expected to be implemented in addition to (net of) those already implemented under the 1989 TCR. The model does not incorporate an estimate of the number of corrective actions implemented per year under the 1989 TCR and does not yield a total for the RTCR and Alternative option that includes the 1989 TCR corrective actions. Benefits shown include corrective actions based on L2 assessments. Detailed benefits and cost information is provided in Appendices A and C, respectively, of the RTCR EA (USEPA 2012a).

[3] As explained in section VI.F.2.f of this preamble, *Corrective actions,* for modeling purposes, EPA estimates the net change only in the number of corrective actions performed under the RTCR and Alternative option compared to the 1989 TCR and thus did not quantify the (non-zero) baseline number of corrective actions performed under the 1989 TCR.

I. Benefits From Simultaneous Reduction of Co-occurring Contaminants

As discussed in section VI.E of this preamble, *Anticipated Benefits of the RTCR,* the potential benefits from the RTCR include avoidance of a full range of health effects from the consumption of fecally contaminated drinking water, including the following: acute and chronic illness, endemic and epidemic disease, waterborne disease outbreaks, and death.

Systems may choose corrective actions that also reduce other drinking water contaminants as a result of the fact that the corrective action eliminates a pathway of potential contamination into the distribution system. For example, eliminating a cross connection reduces the potential for chemical contamination as well as microbial. Due to a lack of contamination co-occurrence data that could relate to the effect that treatment corrective action may have on contamination entering through distribution system pathways, EPA has not quantified such potential benefits.

J. Change in Risk From Other Contaminants

All surface water systems are already required to disinfect under the SWTR (USEPA 1989b, 54 FR 27486, June 29, 1989) but the RTCR could impact currently undisinfected ground water systems. If a previously undisinfected ground water system chooses disinfection as a corrective action, the disinfectant can react with pipe scale causing increased risk from some contaminants that may be entrained in the pipe scales and other water quality problems. Examples of contaminants that could be released include lead, copper, and arsenic. Disinfection could also possibly lead to a temporary discoloration of the water as the scale is loosened from the pipe. These risks can be addressed by gradually phasing in disinfection to the system, by targeted flushing of distribution system mains, and by maintaining an effective corrosion control program.

Introducing a disinfectant could also result in an increased risk from disinfection byproducts (DBPs). Risk from DBPs has already been addressed in the Stage 1 Disinfection Byproducts Rule (DBPR) (USEPA 1998a) and additional consideration of DBP risk has been addressed in the final Stage 2 DBPR (USEPA 2006e). In general, ground water systems are less likely to experience high levels of DBPs than surface water systems because they have lower levels of naturally occurring organic materials that contribute to DBP formation.

EPA does not expect many previously undisinfected systems to add disinfection as a result of either the RTCR or Alternative rule options. Ground water systems that are not currently disinfecting may eventually install disinfection if RTCR distribution system monitoring and assessments, and/or subsequent source water monitoring required under the GWR, result in the determination that source water treatment is required.

K. Effects of Fecal Contamination and/or Waterborne Pathogens on the General Population and Sensitive Subpopulations

It is anticipated that the requirements of the RTCR will help reduce pathways of entry for fecal contamination and/or waterborne pathogens into the distribution system, thereby reducing risk to both the general population as well as to sensitive subpopulations.

As discussed previously in this preamble, fecal contamination may contain waterborne pathogens including bacteria, viruses, and parasitic protozoa. Waterborne pathogens can cause a variety of illnesses, including acute gastrointestinal illness (AGI) with diarrhea, abdominal discomfort, nausea, vomiting, and other symptoms. Most AGI cases are of short duration and result in mild illness. Other more severe illnesses caused by waterborne pathogens include hemolytic uremic syndrome (HUS) (kidney failure), hepatitis, and bloody diarrhea (WHO 2004). Chronic disease such as irritable bowel syndrome, reduced kidney function, hypertension and reactive arthritis can result from infection by a waterborne agent (Clark *et al.* 2008).

Waterborne pathogens may subsequently infect other people through a variety of other routes (WHO 2004). When humans are exposed to and infected by an enteric pathogen, the pathogen becomes capable of reproducing in the gastrointestinal tract. As a result, healthy humans shed pathogens in their feces for a period ranging from days to weeks. This shedding of pathogens often occurs in the absence of any signs of clinical illness. Regardless of whether a pathogen causes clinical illness in the person who sheds it in his or her feces, the pathogen being shed may infect other people directly by person-to-person spread, contact with contaminated surfaces, and other means, which are collectively referred to as secondary spread.

When sensitive subpopulations are exposed to fecal contamination and/or waterborne pathogens, more severe illness (and sometimes death) can occur. Examples of sensitive subpopulations are provided in chapter 2 of the RTCR EA. The potential health effects associated with sensitive population groups—children, pregnant women, the elderly, and the immunocompromised—are described in the following paragraphs.

1. Risk to Children, Pregnant Women, and the Elderly

Children and the elderly are particularly vulnerable to kidney failure (hemolytic uremic syndrome) caused by the pathogenic bacterium *E. coli* O157:H7. Kidney failure in children and the elderly have resulted from waterborne outbreaks due to exposure to *E. coli* O157:H7 from consuming ground water in Cabool, Missouri (Swerdlow *et al.* 1992); Alpine, Wyoming (Olsen *et al.* 2002); Washington County, New York (NY State DOH 2000); and Walkerton, Ontario, Canada (Health Canada 2000).

The risk of acute illness and death due to viral contamination of drinking water depends on several factors, including the age of the exposed individual. Infants and young children have higher rates of infection and disease from enteroviruses than other age groups (USEPA 1999). Several enteroviruses that can be transmitted through water can have serious health consequences in children. Enteroviruses (which include poliovirus, coxsackievirus, and echovirus) have been implicated in cases of flaccid

paralysis, myocarditis, encephalitis, hemorrhagic conjunctivitis, and diabetes mellitus (Dalldorf and Melnick 1965; Smith 1970; Berlin *et al.* 1993; Cherry 1995; Melnick 1996; CDC 1997; Modlin 1997). Women may be at increased risk from enteric viruses during pregnancy (Gerba *et al.* 1996). Enterovirus infections in pregnant women can also be transmitted to the unborn child late in pregnancy, sometimes resulting in severe illness in the newborn (USEPA 2000b).

Other waterborne viruses can also be particularly harmful to children. Rotavirus disproportionately affects children less than five years of age (Parashar *et al.* 1998). However, the pentavalent rotavirus vaccine licensed for use in the United States has been shown to be 74 percent effective against rotavirus gastroenteritis of any severity (Dennehy 2008). For echovirus, children are disproportionately at risk of becoming ill once infected (Modlin 1986). According to CDC, echovirus is not a vaccine-preventable disease (CDC 2007).

The elderly are particularly at risk from diarrheal diseases (Glass *et al.* 2000) such as those associated with waterborne pathogens. In the US, approximately 53 percent of diarrheal deaths occur among those older than 74 years of age, and 77 percent of diarrheal deaths occur among those older than 64 years of age. In Cabool, Missouri (Swerdlow *et al.* 1992), a waterborne *E. coli* O157:H7 outbreak in a ground water system resulted in four deaths, all among the elderly. One death occurred from HUS (kidney failure), the others from gastrointestinal illness. Furthermore, hospitalizations due to diarrheal disease are higher in the elderly than younger adults (Glass *et al.* 2000). Average hospital stays for individuals older than 74 years of age due to diarrheal illness are 7.4 days compared to 4.1 days for individuals aged 20 to 49 (Glass *et al.* 2000).

It is anticipated that the requirements of the RTCR will help reduce pathways of entry for fecal contamination and/or waterborne pathogens into the distribution system, thereby reducing risk to both the general population as well as to sensitive subpopulations such as children, pregnant women, and the elderly.

2. Risk to Immunocompromised Persons

AGI symptoms may be more severe in immunocompromised persons (Frisby *et al.* 1997; Carey *et al.* 2004). Such persons include those with acquired immune deficiency syndrome (AIDS), cancer patients undergoing chemotherapy, organ transplant recipients treated with drugs that suppress the immune system, and patients with autoimmune disorders such as lupus. In AIDS patients, *Cryptosporidium,* a waterborne protozoa, has been found in the lungs, ear, stomach, bile duct, and pancreas in addition to the small intestine (Farthing 2000). Immunocompromised patients with severe persistent cryptosporidiosis may die (Carey *et al.* 2004).

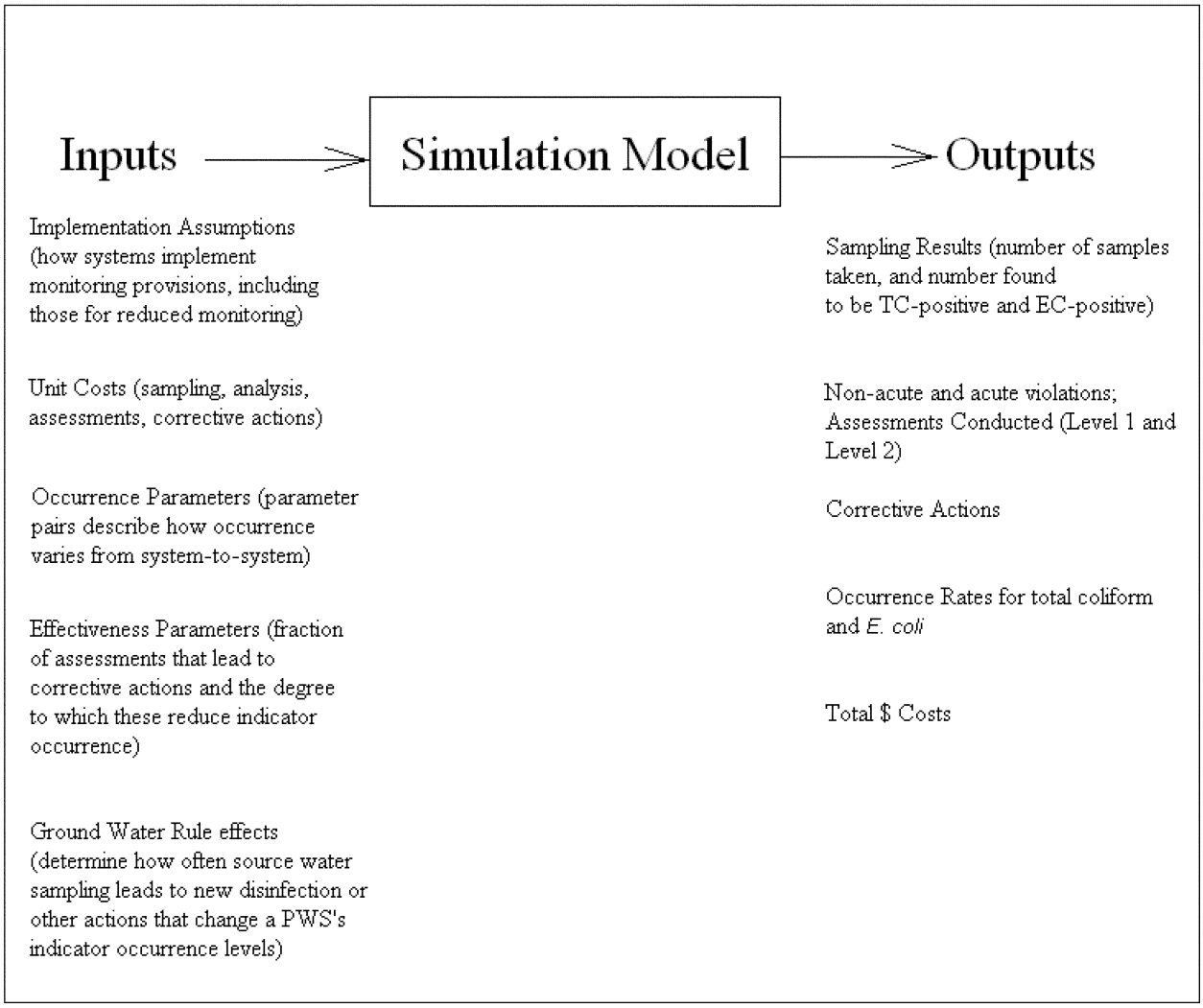
For the immunocompromised, Gerba *et al.* (1996) reviewed the literature and reported that enteric adenovirus and rotavirus are the two waterborne viruses most commonly isolated in the stools of AIDS patients. For patients undergoing bone-marrow transplants, several studies cited by Gerba *et al.* (1996) reported mortality rates greater than 50 percent among patients infected with enteric viruses.

It is anticipated that the requirements of the RTCR will help reduce pathways of entry for fecal contamination and/or waterborne pathogens into the distribution system, thereby reducing risk to both the general population as well as to sensitive subpopulations such as the immunocompromised.

L. Uncertainties in the Benefit and Cost Estimates for the RTCR

A computer simulation model was used to estimate costs and indicators of benefits of the RTCR. Exhibit VI–24 shows that these outputs depend on a number of key model inputs. This section describes analyses that were conducted to understand how uncertainties in these inputs contributed to uncertainty in model outputs.

Exhibit VI-24 Simulation Model, Inputs, and Outputs



1. Inputs and Their Uncertainties

It is anticipated that the requirements of the RTCR will help reduce pathways of entry for fecal contamination and/or waterborne pathogens into the distribution system, thereby reducing exposure and illness from these contaminants in drinking water. These exposure and illness reductions could not be modeled and estimated quantitatively, due to a lack of a quantitative relationship between indicators and pathogens. Section VI.E.3 of this preamble, *Nonquantifiable benefits,* and chapter 6 of the RTCR EA discuss this issue qualitatively.

Model outputs include two important indicators that are used to qualitatively describe benefits: *E. coli* occurrence in routine total coliform samples and the occurrence of Level 1 and 2 assessments. These outputs were monitored as endpoints in the sensitivity analyses described in this section.

Quantified national cost estimates include costs of required monitoring, assessments, corrective actions, and public notifications. Total costs were monitored as end-points in the sensitivity analyses described in this section.

None of the inputs shown in Exhibit VI–24 is perfectly known, so each has some degree of uncertainty. Some of these inputs are informed directly by data, so their uncertainties are due to limitations of the data. For example, uncertainty about the statistical model used to characterize occurrence is due to the limited numbers of systems and measurements per system in the Six-Year Review 2 dataset. Other inputs are informed by professional judgment, so their uncertainties are expressed in terms of reasonable upper and lower bounds that are, themselves, based on expert judgment. For example, 10 percent of assessments (representing the incremental increase over the 1989 TCR) are expected to result in effective corrective actions, based on professional judgment, with reasonable upper and lower bounds of 20 percent and 5 percent, respectively.

Sensitivity analyses were conducted to assess the degree to which uncertainties about selected inputs contribute to uncertainty in the resulting cost estimates. The analyses focused on the inputs that are listed in Exhibit VI–24. Varying the assumptions about the percentages of corrective actions identified and the effectiveness of those actions has a less than linear effect on outcomes, and the RTCR continues to be less costly than the Alternative option under all scenarios modeled. Exhibits 5.22a and 5.22b of the RTCR EA provide summaries of the driving model parameters and indicate where in the RTCR EA the full discussion of uncertainty on each parameter is contained.

Not shown in Exhibit VI–24 are some inputs that are very well known. These are inventory data, which include the list of all PWSs affected by the RTCR and, for each system, information on its source water type, disinfection practice, and population served. Although this information is not perfect, any uncertainty is believed to have negligible impact on model outputs. EPA did not conduct sensitivity analyses to evaluate the importance of these small uncertainties.

2. Sensitivity Analysis

Default values of the model inputs are considered reasonable best-estimates. Model outputs that are obtained when the inputs are set to these default values are also considered to be reasonable best-estimates. EPA conducted sensitivity analyses to learn how much the outputs might change when individual inputs are changed from their default values. The approach taken was to change each input to some reasonable upper and lower bounds, based on professional judgment.

Many of the uncertainties are expected to impact the model output in a similar fashion for the 1989 TCR, RTCR, and the Alternative option. For example, an increase in a total coliform occurrence tends to increase the total cost and benefit estimates for all of the rule alternatives. Because the benefit and cost analyses focus on net changes among the 1989 TCR, RTCR, and Alternative option, these common sources of uncertainty may tend to cancel out in the net change analyses. Other uncertainties were expected to have stronger influence on net changes among the 1989 TCR, RTCR, and Alternative option because of their unequal influence on the options. For example, assumptions about the effectiveness of corrective actions influences total costs of the RTCR and Alternative option, but not the 1989 TCR option.

Results of the sensitivity analyses (reported in the RTCR EA) showed that the fundamental conclusions of the economic analysis do not change over a wide range of assumptions. Both the RTCR and Alternative option provide benefits as compared to the 1989 TCR. Varying key assumptions has a less than linear effect on outcomes, and the RTCR continues to be less costly than the Alternative option under all scenarios modeled. See section 5.3.3.1 of the RTCR EA for details.

M. Benefit Cost Determination for the RTCR

Pursuant to SDWA section 1412(b)(6)(A), EPA has determined that the benefits of the RTCR justify the costs. In making this determination, EPA considered quantified and nonquantified benefits and costs as well as the other components of the HRRCA outlined in section 1412(b)(3)(C) of the SDWA.

Additionally, EPA used several other techniques to compare benefits and costs including a break-even analysis and a cost effectiveness analysis. EPA developed a break-even analysis to inform the discussion of whether the benefits justify the cost of the regulation. The break-even analysis (see chapter 9 of the RTCR EA) was conducted using two example pathogens responsible for some (unknown) proportion of waterborne illnesses in the United States: shiga toxin-producing *E. coli* O157:H7 [2] (STEC O157:H7) and *Salmonella*. In the break-even analysis, CDC and Economic Research Service (ERS) estimates were used for STEC O157:H7 and *Salmonella* infections, respectively. Valuations of medical cases were developed using the ERS Foodborne Illness Calculator. Chapter 9 of the RTCR EA has a complete discussion of the break even analysis and how costs per case were calculated.

Based on either example pathogen considered in the breakeven analysis, a small number of fatal cases annually would need to be avoided, relative to the CDC's estimate of cases caused by waterborne pathogens, in order to break even with rule costs. For example, under the RTCR, just two deaths would need to be avoided annually using a three percent discount rate based on consideration of the bacterial pathogen STEC O157:H7. Alternatively, approximately 3,000 or 8,000 non-fatal cases, using the enhanced or traditional benefits valuations approaches,[3] respectively, would need to be avoided to break even with rule costs. As expected based on its costs, the lower cost of the RTCR relative to the Alternative option means that fewer cases need to be avoided in order to break even. See Exhibit VI–25.

As Exhibit VI–25 shows, approximately 2 deaths would need to be avoided from a *Salmonella* infection for the rule to break even. The estimated number of non-fatal *Salmonella* cases that would need to be avoided to break even is approximately 10,000 or 68,000 cases under the enhanced and traditional benefits valuations approaches, respectively. Given the large number of potential waterborne pathogens shown to occur in PWSs and the relatively low net costs of the RTCR, EPA believes, as discussed in this section and in the RTCR EA, that the RTCR is likely to at least break even. Chapter 9 of the RTCR EA has a complete discussion of the break-even analysis and how costs per case were calculated.

EXHIBIT VI–25—ESTIMATED BREAKEVEN THRESHOLD FOR AVOIDED CASES OF *E. coli* O157:H7 AND *Salmonella*

Cost of illness (COI) methodology	Discount rate (percent)	RTCR		Alternative option	
		Non-fatal cases only	Fatal cases only [1]	Non-fatal cases only	Fatal cases only [1]
E. coli O157:H7					
Traditional COI	3	8,000	1.6	17,000	3.4
	7	8,000	1.6	18,000	3.6
Enhanced COI	3	3,000	1.6	6,000	3.4
	7	3,000	1.6	6,000	3.6
Salmonella					

[2] According to the Web site of the American Academy of Family Physicians (*http://www.aafp.org/afp/20000401/tips/11.html*), ''Shiga toxin-producing *Escherichia coli* is a group of bacteria strains capable of causing significant human disease. The pathogen is transmitted primarily by food and has become an important pathogen in industrialized North America. The subgroup enterohemorrhagic *E. coli* includes the relatively important serotype O157:H7, and more than 100 other non-O157 strains.''

[3] Both traditional and enhanced cost of illness (COI) approaches count the value of the direct medical costs and of time lost that would been spent working for a wage, but differ in their assessment of the value of time lost that would be spent in nonmarket work (e.g., housework, yardwork, and raising children) and leisure (e.g., recreation, family time, and sleep). They also differ in their valuation of (other) disutility, which encompasses a range of factors of well-being, including both inconvenience and any pain and suffering. A complete discussion of the traditional and enhanced COI approaches can be found in Appendix E of the RTCR EA (USEPA 2012a).

EXHIBIT VI–25—ESTIMATED BREAKEVEN THRESHOLD FOR AVOIDED CASES OF *E. coli* O157:H7 AND *Salmonella*—Continued

Cost of illness (COI) methodology	Discount rate (percent)	RTCR		Alternative option	
		Non-fatal cases only	Fatal cases only [1]	Non-fatal cases only	Fatal cases only [1]
Traditional COI	3	68,000	1.6	141,000	3.4
	7	68,000	1.6	151,000	3.6
Enhanced COI	3	10,000	1.6	21,000	3.4
	7	10,000	1.6	23,000	3.6

[1] Calculations for fatal cases include the non-fatal COI component for the underlying illness prior to death.

Note: The number of cases needed to reach break-even threshold is calculated by dividing the net change in costs for the RTCR by the average estimated value of avoided cases.

E. coli O157:H7 and *Salmonella* are only two of multiple pathogenic endpoints that could have been used for this analysis. Use of additional pathogenic contaminants in addition to these single endpoints would result in lower threshold values.

Detail may not add due to independent rounding.

The breakeven threshold is higher using a 7% discount rate than a 3% discount rate under the Alternative option. This result is consistent with the costs of the Alternative option being higher using the 7% discount rate, which is caused by the frontloading of costs in the period of analysis, as explained further in Chapter 7 of the RTCR EA (USEPA 2012a).

Cost-effectiveness is another way of examining the benefits and costs of the rule. Exhibit VI–26 shows the cost of the rule per corrective action implemented. The cost-effectiveness analysis, as with the net benefits, is limited because EPA was able to only partially quantify and monetize the benefits of the RTCR. As discussed previously and demonstrated in the RTCR EA, the RTCR achieves the lowest cost per corrective action avoided among the options considered. The incremental cost-effectiveness analysis shows that the RTCR has a lower cost per corrective action than the Alternative option.

EXHIBIT VI–26—TOTAL NET ANNUAL COST PER CORRECTIVE ACTION IMPLEMENTED UNDER RTCR AND ALTERNATIVE OPTION, ANNUALIZED (USING THREE PERCENT AND SEVEN PERCENT DISCOUNT RATES)

[$Millions, $2007]

Regulatory scenario	3% discount rate	7% discount rate
RTCR—Net Change	$14.3	$14.2
RTCR—Incremental Number of Corrective Actions (L1 & L2)	616	594
RTCR—Cost Effectiveness Analysis	$0.02	$0.02
Alternative Option—Net Change	$29.6	$31.7
Alternative Option—Incremental Number of Corrective Actions (L1 & L2)	808	819
Alternative Option—Cost Effectiveness Analysis	$0.04	$0.04

Note: Corrective actions include those conducted as a result of either Level 1 or Level 2 assessments. Total rule costs are shown in Exhibit 9.14 of the RTCR EA (USEPA 2012a). Detailed benefits and cost information is provided in Appendices A and C, respectively, of the RTCR EA (USEPA 2012a).

The preferred option for the final rule is the RTCR. The analyses performed as part of the RTCR EA (USEPA 2012a) support the collective judgment and consensus of the advisory committee that the RTCR requirements provide for effective and efficient revisions to the 1989 TCR regulatory requirements. The estimated net cost increase of the RTCR is small ($14M annually) relative to the 1989 TCR and small compared to the net cost increase of the Alternative option ($30M–$32M) relative to the 1989 TCR. In addition, no backsliding in overall risk is predicted.

N. Comments Received in Response to EPA's Requests for Comment

In the proposal for the RTCR, EPA requested comment on the SAB's concerns (selection of the RTCR option and measures for tracking long term effectiveness of RTCR), on replacement and maintenance costs for major distribution system appurtenances, on assumptions regarding State use of annual monitoring and annual site visits, and on assumptions regarding the results and effectiveness of Level 1 and Level 2 assessments. This section summarizes the comments EPA received on these issues.

1. SAB's Concerns

Most comments EPA received were in favor of the selection of the RTCR option over the 1989 TCR and the Alternative option. Commenters thought that the additional transition costs associated with the Alternative option did not justify the relatively small increase in benefits and noted that over the long term the benefits for both options were extremely similar. Some commenters provided EPA with specific input on what kind of data to collect in order to indicate the long term effectiveness of the RTCR. However, most commenters instead emphasized the need for SDWIS to be equipped to record the data, and that necessary changes to SDWIS be made in time for the rule to take effect. EPA remains committed to providing the necessary update to SDWIS before the final rule goes into effect and will continue to work with data users to identify system data collection needs and measures.

2. Costs of Major Distribution System Appurtenances

Most comments supported EPA's decision not to include replacement or maintenance costs of major distribution system appurtenances under the RTCR. However, some commenters expressed concern that some systems, in particular small systems, do not plan for capital expenditures, and therefore these costs should be included. EPA continues to believe, as informed by the TCRDSAC deliberations, that the assessment requirement of the RTCR may help to identify when the useful life of an appurtenance has occurred or

maintenance is required, but that these costs should be attributable to regular maintenance and repair, not to the RTCR. Therefore, EPA has not changed this assumption in the EA for the final rule.

3. Annual Monitoring and Annual Site Visits

Comments on this subject were mixed. Most commenters thought that the assumption that only states that currently allow annual monitoring and conduct annual site visits would continue to do so under the RTCR was a reasonable one. However, there were some commenters that pointed out that some States that currently do not allow annual monitoring may begin to allow it because of a lack of resources and because of the desire to meet only the minimum aspects of the RTCR. Based on stakeholder input and comments received, EPA continues to believe that EPA's original assumption is valid, that only States that currently allow annual monitoring and perform annual visits would continue to do so.

4. Effectiveness of Assessments

Several commenters agreed that EPA made a reasonable assumption that 10 percent of assessments would lead to corrective action above what is occurring under the 1989 TCR. For those that did not agree the assumption was reasonable, the response was split between those that thought the estimate was too high, and those that thought the estimate was too low. Therefore, EPA has chosen to retain the estimate of 10 percent, which was originally derived with stakeholder input.

Several commenters supported the assumptions regarding the effectiveness of corrective actions. Many of these commenters stated that it would be extremely difficult to determine if these assumptions are accurate or not. Some commenters thought that these assumptions were too optimistic and that little or no benefit would be realized by the use of the assessments and corrective action. In the absence of strong consensus for changing these assumptions, EPA has elected to keep the assumptions in place.

O. Other Comments Received by EPA

In addition to comments received as a result of requests for comment, EPA also received comments on various technical aspects of the EA. Those comments included concerns with the analysis in the following areas: EPA's inability to quantify health benefits, small PWS's possible inability to return to reduced monitoring after being triggered into monthly monitoring, the shift of State resources from public health related activities to tracking and compliance under the RTCR, and estimates about the State burden.

1. Quantifying Health Benefits

Some commenters expressed concern that EPA is not quantifying benefits. Instead of quantifying the benefits, the RTCR EA examines the benefits in terms of trade-offs between compliance with the 1989 TCR and the other options considered (RTCR and Alternative option). As allowed under and consistent with the HRRCA requirements outlined in section 1412 (b)(3)(C) of the SDWA, EPA used several methods to qualitatively evaluate the benefits of the RTCR and Alternative option. The qualitative evaluation uses both the judgment of EPA as informed by the TCRDSAC deliberations as well as quantitative estimates of changes in total coliform occurrence and counts of systems implementing corrective actions. EPA acknowledges that the predicted benefits of changes in total coliform occurrence and numbers of corrective actions implemented are a function of model assumptions, and EPA recognizes that there is some uncertainty with the assumptions. However, sensitivity analyses showed that the fundamental conclusions of the EA do not change over a wide range of assumptions tested, and that the RTCR provides benefits over the 1989 TCR.

EPA notes that the supporting analyses that formed the foundation of the RTCR EA were reviewed by the SAB. SAB noted in their report that ''in general, the Committee was impressed by the work the Agency undertook. The Agency obviously did a great deal of work and put a significant amount of thought into making use of the limited amount of data.'' SAB also acknowledged that ''the EA represents the best possible analysis given the paucity of available data'' (SAB 2010).

2. Return to Reduced Monitoring

Some commenters stated that PWSs, in particular NCWSs, will never again qualify for quarterly or annual monitoring under the RTCR once they are triggered into increased monthly monitoring. EPA disagrees with this statement. Under the RTCR, NCWSs that are triggered into monthly monitoring could possibly meet the criteria to once again qualify for (routine) quarterly or (reduced) annual monitoring in as little as one year. Some commenters stated that EPA has underestimated the numbers of systems that will be triggered into monthly monitoring based on existing noncompliance rates, with particular emphasis on systems with monitoring violations.

Consistent with past EPA EA analyses, the occurrence model and cost estimates in the EA do not include estimates for non-compliance with EPA regulatory requirements such as monitoring. In addition, EPA disagrees with many commenters' assumptions that monitoring violation rates will remain the same under the RTCR. EPA believes that the rates of monitoring violations will decrease because of strengthened incentives for systems to monitor and the enhanced consequences of noncompliance. A PWS on quarterly or annual monitoring has a greater incentive under the RTCR to do its monitoring because if it doesn't, it will be triggered into increased monitoring. The 1989 TCR did not include such a requirement. Under the RTCR, if a PWS does not complete its repeat samples, it will be triggered to conduct an assessment. With greater consequences for not completing required sampling, systems will be more likely to complete their monitoring. Thus, EPA believes that rates of monitoring and reporting violations will be lower under the RTCR than they are under the 1989 TCR.

Many commenters had concerns with monitoring violation rates specifically for those systems that are on annual monitoring. EPA believes that the monitoring violation rates for these systems will not be as high as predicted by commenters since one of the requirements to remain on annual monitoring is an annual site visit by the State or a Level 2 assessment. If, at the time of the site visit or the Level 2 assessment, that year's annual samples have not been taken, the State or assessor will have the opportunity to remind the system to take the required samples, assist the system in taking the sample at that time, or include taking the sample as part of the site visit or assessment.

All triggers to increased monitoring in the RTCR are consistent with EPA's position, as informed by TCRDSAC discussions, that annual monitoring is a privilege for only the most well run systems. Systems that are not able to meet annual monitoring requirements would not be considered among the most well run, and therefore would be triggered into more frequent monitoring.

3. Shift of State Resources

Some commenters assert that States will be overwhelmed by the burden of tracking and enforcement activities of RTCR because all small PWSs, especially NCWSs, will be triggered into monthly monitoring under the RTCR

and that this will result in a significant increase in violations and tracking and enforcement activities.

In order to address these concerns, EPA made a change from the proposal to this final rule by changing the result of a monitoring violation trigger for systems on annual monitoring. Instead of a monitoring violation triggering a system directly into monthly monitoring, a monitoring violation will now trigger the system in violation to quarterly monitoring. All other triggers (i.e., *E. coli* MCL violation, a Level 2 assessment, a coliform treatment technique violation) continue to move the system to monthly monitoring. This was done to address concerns that too many systems would end up on monthly monitoring and it would be too burdensome for both systems and States. This change did not affect any cost numbers in the EA since the EA does not model non-compliance. See sections III.C.1.b.iv, *Increased monitoring,* and III.C.2.b, *Ground water NCWSs serving ≤ 1,000 people,* of this preamble for a more detailed explanation of this change.

EPA disagrees with any characterization of tracking and enforcement activities as unrelated to public health protection. Tracking and enforcement helps to ensure that systems take their samples, find contamination when it is present, and assess the system and make any necessary corrections improving public health protection. Thus, tracking and enforcement serves an integral role in the protection of public health that RTCR provides.

4. State Burden

a. Monitoring and Level 2 assessments. Some commenters expressed concern that States would ultimately bear the costs of conducting monitoring and Level 2 assessments of PWSs. Other commenters indicated that some States already cover the costs of monitoring and assessment-type activities under the 1989 TCR but would no longer be able to do so under the RTCR because the rule would require them to shift their resources to enforcement activities. EPA notes that while States do have the right to choose to cover the costs of conducting monitoring and assessments, the PWSs themselves are ultimately responsible for completing these activities. Neither the 1989 TCR nor the RTCR requires States to conduct monitoring for PWSs. The RTCR allows Level 2 assessments to be conducted by parties approved by the State, including the PWS where appropriate. EPA believes that there are many third parties that can reliably conduct Level 2 assessments, including certified operators, professional engineers, circuit riders and others. This flexibility should allow the State to assure thorough assessments without requiring the State to use its own resources to conduct them.

b. Underestimation. Some commenters said that EPA underestimated the cost for systems and States to read and understand the rule. Others assert that EPA underestimated the cost for annual administration. In calculating the estimates for systems and States to read and understand the rule, EPA looked to estimates prepared for other recent rulemakings, including the Aircraft Drinking Water Rule (USEPA 2009, 74 FR 53590, October 19, 2009) and the Lead and Copper Rule Short-Term Revisions (USEPA 2007, 72 FR 57782, October 10, 2007). EPA then considered the rule requirements in comparison to the 1989 TCR, given that systems and States are well acquainted with the 1989 rule. The 4-hour figure is a national average, and may vary due to individual system complexity. EPA continues to believe that the estimated number of hours to read and understand the RTCR is logical.

VII. Statutory and Executive Order Review

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a significant regulatory action. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011) and any changes made in response to OMB recommendations have been documented in the docket for this action.

EPA estimates that the RTCR will have an overall annual impact on PWSs of $14 M and that the impact on small entities (PWSs serving 10,000 people or fewer) will be $10.0M–$10.3M annualized at three and seven percent discount rates, respectively. These impacts are described in sections VI, *Economic Analysis (Health Risk Reduction and Cost Analysis),* and VII.C, *Regulatory Flexibility Act (RFA),* of this preamble, respectively, and in the analysis that EPA prepared of the potential costs and benefits of this action, contained in the RTCR EA.

B. Paperwork Reduction Act

The information collection requirements in this rule will be submitted for approval to the OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. The information collection requirements are not enforceable until OMB approves them.

The information collected as a result of this rule will allow States/primacy agencies and EPA to determine appropriate requirements for specific systems and evaluate compliance with the proposed RTCR. Burden is defined at 5 CFR 1320.3(b) and means the total time, effort, and financial resources required to generate, maintain, retain, disclose, or provide information to or for a Federal agency. The burden for this final rule includes the time needed to conduct the following State and PWS activities:

State activities:

- Read and understand the rule;
- Mobilize (including primacy application), plan, and implement;
- Train PWS and consultant staff;
- Track compliance;
- Analyze and review PWS data;
- Review sample siting plans and recommend any revisions to PWSs;
- Make determinations concerning PWS monitoring requirements;
- Respond to PWSs that have positive samples;
- Recordkeeping;
- Review completed assessment forms and consult with the PWS about the assessment report;
- Review and coordinate with PWSs to determine optimal corrective actions to be implemented; and
- Provide consultation, review PN certifications, and file reports of violations.

PWS activities:

- Read and understand the rule;
- Planning and mobilization activities;
- Revise existing sample siting plans to identify sampling locations and collection schedules that are representative of water throughout the distribution system;
- Conduct routine, additional routine, and repeat monitoring, and report the results as required;
- Complete a Level 1 assessment if the PWS experiences a Level 1 trigger, and submit a form to the State to identify sanitary defects detected, corrective actions completed, and a timetable for any corrective actions not already completed;
- Complete a Level 2 assessment if the PWS experiences a Level 2 trigger, and submit a form to the State to identify sanitary defects detected, corrective actions completed, and a timetable for any corrective actions not already completed;
- Correct sanitary defects found through the performance of Level 1 or

Level 2 assessments and report on completion of corrective actions as required;

• Develop and distribute Tier 1 public notices when *E. coli* MCL violations occur;

• Develop and distribute Tier 2 public notices when the PWSs fail to take corrective action; and

• Develop and distribute Tier 3 public notices when the PWSs fail to comply with the monitoring requirements or with mandatory reporting of required information within the specified timeframe.

For the first three years after publication of the RTCR in the FR, the major information requirements apply to 154,894 respondents. The total incremental burden associated with the change in moving from the information requirements of the 1989 TCR to those in the RTCR over the three years covered by the ICR is 2,518,578 hours, for an average of 839,526 hours per year. The total incremental cost over the three-year clearance period is $71.3M, for an average of $23.8M per year (simple average over three years). (Note that this is higher than the annualized costs for the RTCR because in the EA, the up-front costs that occur in the first three years, as well as future costs, are annualized over a 25-year time horizon.) The average burden per response (i.e., the amount of time needed for each activity that requires a collection of information) is 5.4 hours; the average cost per response is $153. The collection requirements are mandatory under SDWA section 1445(a)(1). Detail on the calculation of the RTCR's information collection burden and costs can be found in the ICR for the Revised Total Coliform Rule (USEPA 2012c) and chapter 8 of the EA (USEPA 2012a). A summary of the burden and costs of the collection is presented in Exhibit VII–1.

EXHIBIT VII–1—AVERAGE ANNUAL NET CHANGE BURDEN AND COSTS FOR THE RTCR ICR

Respondent type	Annual burden hours	Cost				Annual responses
		Annual labor cost	Annual operation & maintenance (O&M) cost	Annual capital cost	Total annual cost	
PWSs	747,848	$20,171,639			$20,171,639	103,225
States and Territories	91,678	3,595,421			3,595,421	51,669
Total	839,526	23,767,060			23,767,060	154,894

Notes: Detail may not add exactly to total due to independent rounding.
"Annual Burden Hours" reflects an annual average for all system sizes over the 3-year ICR period.
Source: ICR for the Revised Total Coliform Rule (USEPA 2012c).

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9. When this ICR is approved by OMB, the Agency will publish a technical amendment to 40 CFR part 9 in the FR to display the OMB control number for the approved information collection requirements contained in this final rule.

C. Regulatory Flexibility Act (RFA)

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

The RFA provides default definitions for each type of small entity. Small entities are defined as: (1) A small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any ''not-for-profit enterprise which is independently owned and operated and is not dominant in its field.'' However, the RFA also authorizes an agency to use alternative definitions for each category of small entity, ''which are appropriate to the activities of the agency'' after proposing the alternative definition(s) in the FR and taking comment. 5 USC 601(3)–(5). In addition, to establish an alternative small business definition, agencies must consult with SBA's Chief Counsel for Advocacy.

For purposes of assessing the impacts of the RTCR on small entities, EPA considered small entities to be PWSs serving 10,000 or fewer people. This is the cut-off level specified by Congress in the 1996 Amendments to the SDWA for small system flexibility provisions. As required by the RFA, EPA proposed using this alternative definition in the FR (63 FR 7620, February 13, 1998), requested public comment, consulted with the SBA, and finalized the alternative definition in the Agency's CCR regulation (63 FR 44524, August 19, 1998). As stated in that Final Rule, the alternative definition would be applied for all future drinking water regulations.

After considering the economic impacts of the RTCR on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. The small entities directly regulated by this rule are small PWSs serving 10,000 or fewer people. These include small CWSs, NTNCWSs, and TNCWSs, entities such as municipal water systems (publicly and privately owned), and privately-owned PWSs and for-profit businesses where provision of water may be ancillary, such as mobile home parks, day care centers, churches, schools and homeowner associations. We have determined that only 61 of 150,672 small systems (0.04%) will experience an impact of more than 1% of revenues, and that none of the small systems will experience an impact of 3% or greater of revenue. This information is described further in chapter 8 of the RTCR EA.

Although this final rule will not have a significant economic impact on a substantial number of small entities, EPA nonetheless has tried to reduce the impact of this rule on small PWSs. Provisions in the RTCR that result in

reduced costs for many small entities include:

- Reduced routine monitoring for qualifying PWSs serving 1,000 or fewer people.
- Reduced number of repeat samples required for systems serving 1,000 or fewer people.
- Reduced additional routine monitoring for PWSs serving 4,100 or fewer people.
- Reduced PN requirements for all systems, including small systems.

EPA also conducted outreach to small entities and convened a Small Business Advocacy Review Panel to obtain advice and recommendations of representatives of the small entities that potentially would be subject to this rule's requirements. For a description of the Small Business Advocacy Review Panel and stakeholder recommendations, please see section VII.C of the preamble to the proposed RTCR, *Regulatory Flexibility Act (RFA).*

D. Unfunded Mandates Reform Act (UMRA)

This rule does not contain a Federal mandate under the provisions of Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531–1538 that may result in expenditures to State, local, and Tribal governments, in the aggregate, or to the private sector, of $100M or more in any one year. Expenditures associated with compliance, defined as the incremental costs beyond the 1989 TCR, will not surpass $100M in the aggregate in any year. Thus, this rule is not subject to the requirements of sections 202 and 205 of UMRA.

The RTCR is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. Costs to small entities are generally not significant, as described previously in section VII.C of this preamble, *Regulatory Flexibility Act (RFA),* and are detailed in the RTCR EA. The regulatory requirements of the final RTCR are not unique to small governments, as they apply to all PWSs regardless of size.

E. Executive Order 13132: Federalism

This action does not have Federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government as specified in Executive Order 13132. The net change in cost for State, local, and Tribal governments in the aggregate is estimated to be approximately $0.2M and $0.4M at three percent and seven percent discount rates, respectively. Thus, Executive Order 13132 does not apply to this final rule.

Although section 6 of Executive Order 13132 does not apply to the RTCR, EPA conducted a Federalism Consultation, consistent with Executive Order 13132, in July 2008. The consultation included a stakeholder meeting where EPA requested comments on the impacts of the potential revisions to the 1989 TCR with respect to State, county and local governments. EPA did not receive any comments in response to this consultation. In addition, the advisory committee included representatives of State, local and Tribal governments, and through this process EPA consulted with State, local, and Tribal government representatives to ensure that their views were considered when the AIP recommendations for the proposed RTCR were developed. EPA also included representatives from four states on its workgroup for developing the proposed RTCR.

In the spirit of Executive Order 13132 and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicited comment on the proposed action from State and local officials. Some States were concerned with the burden of implementing the rule, especially those States that have a high proportion of NCWSs. Under this rule, expenditures for assessments and corrective actions and increased monitoring are targeted to the fraction of PWSs that are most vulnerable to pathways for contamination of the distribution system, thereby minimizing the burden for the majority of PWSs and for States implementing the rule. As described in sections III.E.2, *Assessment,* and III.C.1.b.iv, *Increased monitoring,* of this preamble, EPA is also providing flexibility on how the PWSs and States conduct and track assessments, and by changing the consequence for systems on annual monitoring that have RTCR monitoring violations (i.e., increase to quarterly monitoring instead of monthly monitoring). EPA also has plans to update SDWIS to maximize its efficiency in support of rule implementation. These actions should address many of the State concerns about burden.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). EPA consulted with Tribes throughout the development of the RTCR (as described in this section) and no issues that were particular to Tribal entities were identified.

Although Executive Order 13175 does not apply to this action, EPA consulted with Tribal officials in developing this action. EPA consulted with Tribal governments through the EPA American Indian Environmental Office; included a representative of the Native American Water Association on the advisory committee who helped develop and signed the AIP on recommendations on the proposed rule; and addressed Tribal concerns throughout the regulatory development process, as appropriate. The consultation included participation in three Tribal conference calls (EPA regional Tribal call (February 2008), National Indian Workgroup call (March 2008), and National Tribal Water Conference (March 2008)). EPA requested comments on the 1989 TCR, requested suggestions for 1989 TCR revisions (March 2008), and presented possible revisions to the 1989 TCR to the National Tribal Council (April 2008). In addition, the advisory committee included a representative from the Native American Water Association who represented Tribal entities, and through this process EPA ensured that Tribal views were considered when the AIP recommendations for the proposed RTCR were developed. None of these consultations identified issues that were particular to Tribal entities. EPA also specifically solicited additional comment on the proposed rule from Tribal officials, and no additional issues were identified. As a result of the Tribal consultations and other Tribal outreach, EPA has determined that the RTCR is not anticipated to have a negative impact on Tribal systems. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

The RTCR is not subject to Executive Order 13045 (62 FR 19885, April 23, 1997) because it is not economically significant as defined in Executive Order 12866, and because the Agency does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessments regarding children are contained in section VI.K.1 of this preamble, *Risk to children, pregnant women, and the elderly,* and in the RTCR EA. EPA expects that the RTCR would provide additional protection to

both children and adults who consume drinking water supplied from PWSs. EPA also believes the benefits of this rule, including reduced health risk, accrue more to children because young children are more susceptible than adults to some waterborne illnesses. For example, the risk of mortality resulting from diarrhea is often greatest in the very young and elderly (Rose 1997; Gerba *et al.* 1996), and viral and bacterial illnesses often disproportionately affect children. Any overall benefits of the rule would reduce this mortality risk for children.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This rule is not a ''significant energy action'' as defined in Executive Order 13211 (66 FR 28355, May 22, 2001), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Additionally, none of the requirements of this rule involve the installation of treatment or other components that use a measurable amount of energy.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, 12(d) (15 U.S.C. 272 note), directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when EPA decides not to use available and applicable voluntary consensus standards.

This rule involves technical voluntary consensus standards. As in the 1989 TCR, under the provisions of the RTCR water systems are required to use several analytical methods to monitor for total coliforms and/or *E. coli* as they are described in *Standard Methods for the Examination of Water and Wastewater,* 20th and 21st editions (Clesceri *et al.* 1998; Eaton *et al.* 2005). Methods included in *Standard Methods* are voluntary consensus standards. The 1989 TCR and RTCR include the same 11 methods that can be used to test for total coliforms. Four of the 11 are voluntary consensus methods described in *Standard Methods.*

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission. Agencies must do this by identifying and addressing, as appropriate, any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the U.S.

EPA has determined that this action will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. The RTCR applies uniformly to all PWSs and consequently provides health protection equally to all income and minority groups served by PWSs. The RTCR and other drinking water regulations are expected to have a positive effect on human health regardless of the social or economic status of a specific population. To the extent that contaminants in drinking water might be disproportionately high among minority or low-income populations (which is unknown), the RTCR contributes toward removing those differences by assuring that all public water systems meet drinking water standards and take appropriate corrective action whenever appropriate. Thus, the RTCR meets the intent of the Federal policy requiring incorporation of environmental justice into Federal agency missions.

K. Consultations With the Science Advisory Board, National Drinking Water Advisory Council, and the Secretary of Health and Human Services

In accordance with section 1412(d) and (e) of the SDWA, EPA consulted with the SAB, the NDWAC, and the Secretary of the US Department of Health and Human Services on the RTCR.

EPA met with the Drinking Water Committee (DWC) of the SAB to discuss the proposed RTCR on May 20, 2009 (teleconference) and June 9 and 10, 2009 (Washington, DC). The SAB DWC review focused on (1) the data sources used to estimate baseline total coliform and *E. coli* occurrence, public water system profile, and sensitive subpopulations in the US; (2) the occurrence analysis used to inform the benefits analysis; (3) the qualitative analysis used to assess the reduction in risk due to implementation of the rule requirements; and (4) analysis of the engineering costs and costs to States resulting from implementation of the revisions.

Overall, the SAB DWC supported EPA's analysis. SAB members commended EPA for making use of the best available data to assess the impacts of the proposed rule. The SAB DWC supported the decision by EPA not to quantify public health benefits, acknowledging that EPA had insufficient data to do so. However, they noted in their analysis of the EA that they are not generally supportive of decreased monitoring, and that overall, the Alternative option appears to address and protect public health sooner in time than the AIP proposed implementation. The SAB DWC recommended that EPA clarify rationales for assumptions; expand explanations of sensitivity analyses that were included; provide further justification in those areas in which sensitivity analyses were not conducted; and collect data after promulgation of the rule to allow EPA to better understand the public health impacts of the RTCR.

In response to the SAB DWC recommendations, EPA conducted sensitivity analyses to explore a wider range of assumptions regarding the percentage of assessments leading to corrective actions and to demonstrate that using an annual average for occurrence provided results comparable to varying the occurrence based on the season. EPA also added an exhibit in the EA that summarizes all significant model parameters and assumptions, their influence on variability and uncertainty, and their most likely effect on benefits or costs. The added exhibits and expanded and clarified text can be found in the RTCR EA. A copy of the SAB report (SAB 2010) is available in the docket for this rule.

EPA consulted with NDWAC on May 28, 2009, in Seattle, Washington, to discuss the proposed RTCR. NDWAC members expressed concern that a rule based on the AIP sounds complicated and recommended that EPA provide the utilities and States with tools to help them understand the revised rule provisions and to assist with providing public education. In response to

NDWAC's concern, EPA requested comment on whether the proposed RTCR would result in requirements that would be easier to implement compared to the 1989 TCR.

EPA heard from commenters that the RTCR will be difficult to implement in States that have a lot of small NCWSs, especially the reduced and increased monitoring provisions. To address this concern, EPA provided flexibility to States to help them implement, and to PWSs to help them comply, with the monitoring provisions of the RTCR. States are given the flexibility to not count monitoring violations towards eligibility for a TNCWS to remain on quarterly monitoring or to return to quarterly monitoring as long as the system collects the make-up sample by the end of the next monitoring period. EPA also changed the consequence of having one RTCR monitoring violation for systems on annual monitoring. Instead of having to go to monthly monitoring, the system now moves to quarterly monitoring. See section III.C.2.b of this preamble, *Ground water NCWSs serving ≤ 1,000 people,* for more details.

NDWAC members also suggested that EPA request comment on the costs and benefits of reduced monitoring. Specifically, NDWAC expressed concern that a reduction in the number of certain samples taken (such as the reduction in the number of repeat and additional routine samples for some small systems) could lessen the opportunity for systems to identify violations. Thus, EPA requested comment on the cost and benefit of reduced monitoring.

EPA received comment that expressed concern that a reduction in the number of additional routine samples reduces the likelihood of detecting both total coliforms and *E. coli.* EPA and the advisory committee recognized that a reduction in the number of samples taken could also mean a reduction in the number of positive samples found. However, EPA and the advisory committee concluded that the new assessment and corrective action provisions of the RTCR lead to a rule that is more protective of public health and to improvement in water quality despite the reductions in the number of samples taken. See section III.C.2.b of this preamble, *Ground water NCWSs serving ≤ 1,000 people,* for more details.

A few NDWAC members stated that they would like to provide EPA with additional advice on PN. To follow up on this request, EPA met with several NDWAC members on July 1, 2009, to review and discuss the 1989 TCR PN requirements, the advisory committee's recommendations on revisions to the PN requirements, and to obtain feedback from NDWAC members. EPA considered the recommendations from NDWAC in developing the PN requirements and requested comment on these issues in the preamble to the proposed RTCR.

EPA consulted with NDWAC again on July 21, 2011, to discuss the draft final rule and comments received on the proposed RTCR, specifically regarding those areas where NDWAC made recommendations in the March and July 2009 consultations. The NDWAC members recommended that in finalizing the RTCR, EPA follow the recommendations of the TCRDSAC.

EPA completed its consultations with the US Department of Health and Human Services on October 5, 2009, and August 8, 2011, as required by SDWA section 1412(d). EPA provided an informational briefing to the Center for Food Safety office of the Food and Drug Administration and representatives from the Office of the Assistant Secretary for Health and the Assistant Secretary for Planning and Evaluation at the Department of Health and Human Services. No substantive comments were received as a result of the briefing and consultation.

L. Considerations of Impacts on Sensitive Subpopulations as Required by Section 1412(b)(3)(C)(i)(V) of the 1996 Amendments of SDWA

As required by Section 1412(b)(3)(C)(i)(V) of the SDWA, EPA sought public comment regarding the effects of contamination associated with the proposed RTCR on the general population and sensitive subpopulations. Sensitive subpopulations include ''infants, children, pregnant women, the elderly, individuals with a history of serious illness, or other subpopulations that are identified as likely to be at greater risk of adverse health effects due to exposure to contaminants in drinking water than the general population'' (SDWA section 1412(b)(3)(C)(i)(V), 42 U.S.C. 300g–1(b)(3)(C)(i)(V)).

Pregnant and lactating women may be at an increased risk from pathogens as well as act as a source of infection for newborns. Infection during pregnancy may also result in the transmission of infection from the mother to the child *in utero,* during birth, or shortly thereafter. Since very young children do not have fully developed immune systems, they are at increased risk and are particularly difficult to treat.

Infectious diseases are also a major problem for the elderly because immune function declines with age. As a result, outbreaks of waterborne diseases can be devastating on the elderly community (e.g., nursing homes) and may increase the possibility of significantly higher mortality rates in the elderly than in the general population.

Immunocompromised individuals are a growing proportion of the population with the continued increase in Human Immunodeficiency Virus/AIDS, the aging population, and the escalation in organ and tissue transplantations. Immunocompromised individuals are more susceptible to severe and invasive infection. These infections are particularly difficult to treat and can result in a significantly higher mortality than in immunocompetent persons.

It is anticipated that the requirements of the RTCR will help reduce pathways of entry for fecal contamination and/or waterborne pathogens into the distribution system, thereby reducing exposure and risk from these contaminants in drinking water to the entire general population. The RTCR seeks to provide a similar level of drinking water protection to all groups including sensitive subpopulations, thus meeting the intent of this Federal policy. See also section VI.K of this preamble, *Effects of Fecal Contamination and/or Waterborne Pathogens on the General Population and Sensitive Subpopulations,* for a more detailed discussion of this topic.

M. Effect of Compliance With the RTCR on the Technical, Financial, and Managerial Capacity of Public Water Systems

Section 1420(d)(3) of the SDWA, as amended, requires that, in promulgating an NPDWR, the Administrator shall include an analysis of the likely effect of compliance with the regulation on the technical, managerial, and financial (TMF) capacity of PWSs. The following analysis fulfills this statutory obligation by identifying the incremental impact that the RTCR will have on the TMF capacity of regulated water systems. Analyses presented in this document reflect only the impact of new or revised requirements, as established by the RTCR; the impacts of previously established requirements on system capacity are not considered.

EPA has defined overall water system capacity as the ability to plan for, achieve, and maintain compliance with applicable drinking water standards. Capacity encompasses three components: technical, managerial, and financial. Technical capacity is the physical and operational ability of a water system to meet SDWA requirements. This refers to the physical infrastructure of the water system,

including the adequacy of source water and the adequacy of treatment, storage, and distribution infrastructure. It also refers to the ability of system personnel to adequately operate and maintain the system and to otherwise implement requisite technical knowledge. Managerial capacity is the ability of a water system to conduct its affairs to achieve and maintain compliance with SDWA requirements. Managerial capacity refers to the system's institutional and administrative capabilities. Financial capacity is a water system's ability to acquire and manage sufficient financial resources to allow the system to achieve and maintain compliance with SDWA requirements. Technical, managerial, and financial capacity can be assessed through key issues and questions, including the following:

Technical Capacity	
Source water adequacy	Does the system have a reliable source of water with adequate quantity? Is the source generally of good quality and adequately protected?
Infrastructure adequacy	Can the system provide water that meets SDWA standards? What is the condition of its infrastructure, including wells or source water intakes, treatment and storage facilities, and distribution systems? What is the infrastructure's life expectancy? Does the system have a capital improvement plan?
Technical knowledge and implementation	Are the system's operators certified? Do the operators have sufficient knowledge of applicable standards? Can the operators effectively implement this technical knowledge? Do the operators understand the system's technical and operational characteristics? Does the system have an effective O&M program?
Managerial Capacity	
Ownership accountability	Are the owners clearly identified? Can they be held accountable for the system?
Staffing and organization	Are the operators and managers clearly identified? Is the system properly organized and staffed? Do personnel understand the management aspects of regulatory requirements and system operations? Do they have adequate expertise to manage water system operations (i.e., to conduct implementation, monitor for *E. coli*)? Do personnel have the necessary licenses and certifications?
Effective external linkages	Does the system interact well with customers, regulators, and other entities? Is the system aware of available external resources, such as technical and financial assistance?
Financial Capacity	
Revenue sufficiency	Do revenues cover costs?
Creditworthiness	Is the system financially healthy? Does it have access to capital through public or private sources?
Fiscal management and controls	Are adequate books and records maintained? Are appropriate budgeting, accounting, and financial planning methods used? Does the system manage its revenues effectively?

EPA looked at the major requirements of the RTCR that may affect the TMF capacity of PWSs. These requirements include: sample siting plan revision, monitoring, assessments, corrective actions, and PNs. Another factor that may affect the TMF capacity is the need for PWS personnel to familiarize themselves with the RTCR requirements. EPA developed a scoring system to analyze the impact of complying with these requirements on the TMF capacity of PWSs. A detailed discussion of EPA's analysis is presented in chapter 8.14 of the RTCR EA (USEPA 2012a).

The RTCR will apply to all PWSs and may affect 51,972 CWSs, 18,729 NTNCWSs, and 84,136 TNCWSs—154,837 systems in all. While some systems may require increased TMF capacity to comply with the new RTCR requirements, or will need to tailor their compliance approaches to match their capacities, most systems will not.

Small systems will likely face only a small challenge to their technical and managerial capacity as a result of efforts to familiarize themselves with the monitoring requirements of the RTCR. Routine and repeat monitoring requirements under the RTCR are essentially the same as under the 1989 TCR, with more explicit criteria to qualify for reduced monitoring. Therefore, understanding the RTCR monitoring requirements is not expected to pose many new technical or managerial capacity issues for small systems.

Small system technical and managerial capacity may be affected by the assessment requirements of the RTCR. Performing assessments may require the system to increase staffing levels in addition to providing training to ensure that system staff understand how those assessments are to be performed. Reporting, record-keeping, and data administration requirements will also affect the managerial capacity of small systems.

Small systems that are required to take corrective action are expected to experience the most significant financial challenge since some corrective actions may consist of a large, one-time capital expenditure to resolve the problem.

Large systems will likely not face any significant challenge to their technical and managerial capacity as a result of efforts to familiarize themselves with the RTCR. Most large systems are familiar with the 1989 TCR and there are no changes in the basic monitoring requirements for large systems under the RTCR. They are therefore assumed to already have the TMF capacity in place for the RTCR.

Only large systems performing assessments and corrective actions would be expected to face a significant challenge meeting the TMF capacity requirements. However, this requirement is only necessary when monitoring reveals potential problems, and this is not expected to occur significantly in large systems above that experienced under the 1989 TCR. Many large systems already have the TMF capacity to conduct assessments and

corrective actions if they are needed. These systems will be affected less significantly than smaller systems that have to implement corrective actions because it is recognized that they are typically already implementing similar assessments and corrective actions when a routine monitoring sample tests positive for fecal indicators under the 1989 TCR.

N. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the US. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the US prior to publication of the rule in the FR. A Major rule cannot take effect until 60 days after it is published in the FR. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will be effective April 15, 2013.

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List of Subjects

40 CFR Part 141

Environmental protection, Chemicals, Incorporation by reference, Indian-lands, Intergovernmental relations, Radiation protection, Reporting and recordkeeping requirements, Water supply.

40 CFR Part 142

Environmental protection, Administrative practice and procedure, Chemicals, Indian-lands, Radiation protection, Reporting and recordkeeping requirements, Water supply.

Dated: December 20, 2012.

Lisa P. Jackson,

Administrator.

For the reasons set forth in the preamble, Title 40 chapter 1 of the Code of Federal Regulations is amended as follows:

PART 141—NATIONAL PRIMARY DRINKING WATER REGULATIONS

■ 1. The authority citation for part 141 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

■ 2. Section 141.2 is amended by adding, in alphabetical order, definitions for ''Clean compliance history'', ''Level 1 assessment'', ''Level 2 assessment'', ''Sanitary defect'', and ''Seasonal system'' to read as follows:

§ 141.2 Definitions.

* * * * *

Clean compliance history is, for the purposes of subpart Y, a record of no MCL violations under § 141.63; no monitoring violations under § 141.21 or subpart Y; and no coliform treatment technique trigger exceedances or treatment technique violations under subpart Y.

* * * * *

Level 1 assessment is an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. It is conducted by the system operator or owner. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a ground water system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The system must conduct the assessment consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

Level 2 assessment is an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. A Level 2 assessment provides a more detailed examination of the system (including the system's monitoring and operational practices) than does a Level 1 assessment through the use of more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. It is conducted by an individual approved by the State, which may include the system operator. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a ground water system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The system must conduct the assessment consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system. The system must comply with any expedited actions or additional actions required by the State in the case of an *E. coli* MCL violation.

* * * * *

Sanitary defect is 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.

* * * * *

Seasonal system is a non-community water system that is not operated as a public water system on a year-round basis and starts up and shuts down at the beginning and end of each operating season.

* * * * *

■ 3. Section 141.4 is revised to read as follows:

§ 141.4 Variances and exemptions.

(a) Variances or exemptions from certain provisions of these regulations may be granted pursuant to sections 1415 and 1416 of the Act and subpart K of part 142 of this chapter (for small system variances) by the entity with primary enforcement responsibility, except that variances or exemptions from the MCLs for total coliforms and *E. coli* and variances from any of the treatment technique requirements of subpart H of this part may not be granted.

(b) EPA has stayed the effective date of this section relating to the total coliform MCL of § 141.63(a) for systems that demonstrate to the State that the violation of the total coliform MCL is due to a persistent growth of total coliforms in the distribution system rather than fecal or pathogenic contamination, a treatment lapse or deficiency, or a problem in the operation or maintenance of the distribution system. This is stayed until March 31, 2016, at which time the total coliform MCL is no longer effective.

Note to paragraph (a): As provided in § 142.304(a), small system variances are not available for rules addressing microbial contaminants, which would

include subparts H, P, S, T, W, and Y of this part.

■ 4. Section 141.21 is amended by adding paragraph (h) to read as follows:

§ 141.21 Coliform sampling.

* * * * *

(h) The provisions of paragraphs (a) and (d) of this section are applicable until March 31, 2016. The provisions of paragraphs (b), (c), (e), (f), and (g) of this section are applicable until all required repeat monitoring under paragraph (b) of this section and fecal coliform or *E. coli* testing under paragraph (e) of this section that was initiated by a total coliform-positive sample taken before April 1, 2016 is completed, as well as analytical method, reporting, recordkeeping, public notification, and consumer confidence report requirements associated with that monitoring and testing. Beginning April 1, 2016, the provisions of subpart Y of this part are applicable, with systems required to begin regular monitoring at the same frequency as the system-specific frequency required on March 31, 2016.

■ 5. Section 141.52 is revised to read as follows:

§ 141.52 Maximum contaminant level goals for microbiological contaminants.

(a) MCLGs for the following contaminants are as indicated:

Contaminant	MCLG
(1) *Giardia lamblia*	zero
(2) Viruses	zero
(3) *Legionella*	zero
(4) Total coliforms (including fecal) coliforms and *Escherichia coli*.	zero
(5) *Cryptosporidium*	zero
(6) *Escherichia coli (E. coli)*	zero

(b) The MCLG identified in paragraph (a)(4) of this section is applicable until March 31, 2016. The MCLG identified in paragraph (a)(6) of this section is applicable beginning April 1, 2016.

■ 6. Section 141.63 is revised to read as follows:

§ 141.63 Maximum contaminant levels (MCLs) for microbiological contaminants.

(a) Until March 31, 2016, the total coliform MCL is based on the presence or absence of total coliforms in a sample, rather than coliform density.

(1) For a system that collects at least 40 samples per month, if no more than 5.0 percent of the samples collected during a month are total coliform-positive, the system is in compliance with the MCL for total coliforms.

(2) For a system that collects fewer than 40 samples per month, if no more than one sample collected during a month is total coliform-positive, the system is in compliance with the MCL for total coliforms.

(b) Until March 31, 2016, any fecal coliform-positive repeat sample or *E. coli*-positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or *E. coli*-positive routine sample, constitutes a violation of the MCL for total coliforms. For purposes of the public notification requirements in subpart Q of this part, this is a violation that may pose an acute risk to health.

(c) Beginning April 1, 2016, a system is in compliance with the MCL for *E. coli* for samples taken under the provisions of subpart Y of this part unless any of the conditions identified in paragraphs (c)(1) through (c)(4) of this section occur. For purposes of the public notification requirements in subpart Q of this part, violation of the MCL may pose an acute risk to health.

(1) The system has an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

(2) The system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

(3) The system fails to take all required repeat samples following an *E. coli*-positive routine sample.

(4) The system fails to test for *E. coli* when any repeat sample tests positive for total coliform.

(d) Until March 31, 2016, a public water system must determine compliance with the MCL for total coliforms in paragraphs (a) and (b) of this section for each month in which it is required to monitor for total coliforms. Beginning April 1, 2016, a public water system must determine compliance with the MCL for *E. coli* in paragraph (c) of this section for each month in which it is required to monitor for total coliforms.

(e) The Administrator, pursuant to section 1412 of the Act, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant level for total coliforms in paragraphs (a) and (b) of this section and for achieving compliance with the maximum contaminant level for *E. coli* in paragraph (c) of this section:

(1) Protection of wells from fecal contamination by appropriate placement and construction;

(2) Maintenance of a disinfectant residual throughout the distribution system;

(3) Proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks and reservoirs, cross connection control, and continual maintenance of positive water pressure in all parts of the distribution system;

(4) Filtration and/or disinfection of surface water, as described in subparts H, P, T, and W of this part, or disinfection of ground water, as described in subpart S of this part, using strong oxidants such as chlorine, chlorine dioxide, or ozone; and

(5) For systems using ground water, compliance with the requirements of an EPA-approved State Wellhead Protection Program developed and implemented under section 1428 of the SDWA.

(f) The Administrator, pursuant to section 1412 of the Act, hereby identifies the technology, treatment techniques, or other means available identified in paragraph (e) of this section as affordable technology, treatment techniques, or other means available to systems serving 10,000 or fewer people for achieving compliance with the maximum contaminant level for total coliforms in paragraphs (a) and (b) of this section and for achieving compliance with the maximum contaminant level for *E. coli* in paragraph (c) of this section.

■ 7. Section 141.71 is amended by revising paragraph (b)(5) to read as follows:

§ 141.71 Criteria for avoiding filtration.

* * * * *

(b) * * *

(5) The public water system must comply with the maximum contaminant level (MCL) for total coliforms in § 141.63(a) and (b) and the MCL for *E. coli* in § 141.63(c) at least 11 months of the 12 previous months that the system served water to the public, on an ongoing basis, unless the State determines that failure to meet this requirement was not caused by a deficiency in treatment of the source water.

* * * * *

■ 8. Section 141.74 is amended by revising paragraphs (b)(6)(i) and (c)(3)(i) to read as follows:

§ 141.74 Analytical and monitoring requirements.

* * * * *

(b) * * *

(6)(i) Until March 31, 2016, the residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in § 141.21.

Beginning April 1, 2016, the residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in §§ 141.854 through 141.858. The State may allow a public water system which uses both a surface water source or a ground water source under direct influence of surface water, and a ground water source, to take disinfectant residual samples at points other than the total coliform sampling points if the State determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in paragraph (a)(1) of this section, may be measured in lieu of residual disinfectant concentration.

* * * * *

(c) * * *

(3)(i) Until March 31, 2016, the residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in § 141.21. Beginning April 1, 2016, the residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in §§ 141.854 through 141.858. The State may allow a public water system which uses both a surface water source or a ground water source under direct influence of surface water, and a ground water source, to take disinfectant residual samples at points other than the total coliform sampling points if the State determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in paragraph (a)(1) of this section, may be measured in lieu of residual disinfectant concentration.

* * * * *

■ 9. Section 141.132 is amended by revising paragraph (c)(1)(i) to read as follows:

§ 141.132 Monitoring requirements.

* * * * *

(c) * * *

(1) * * *

(i) *Routine monitoring.* Until March 31, 2016, community and non-transient non-community water systems that use chlorine or chloramines must measure the residual disinfectant level in the distribution system at the same point in the distribution system and at the same time as total coliforms are sampled, as specified in § 141.21. Beginning April 1, 2016, community and non-transient non-community water systems that use chlorine or chloramines must measure the residual disinfectant level in the distribution system at the same point in the distribution system and at the same time as total coliforms are sampled, as specified in §§ 141.854 through 141.858. Subpart H systems of this part may use the results of residual disinfectant concentration sampling conducted under § 141.74(b)(6)(i) for unfiltered systems or § 141.74(c)(3)(i) for systems which filter, in lieu of taking separate samples.

* * * * *

■ 10. Section 141.153 is amended as follows:

■ a. By adding paragraphs (c)(4),

■ b. By revising paragraph (d)(4)(iv) introductory text,

■ c. By revising paragraph (d)(4)(vii) introductory text,

■ d. By revising paragraph (d)(4)(viii),

■ e. By adding paragraph (d)(4)(x), and

■ f. By adding paragraph (h)(7).

§ 141.153 Content of the reports.

* * * * *

(c) * * *

(4) A report that contains information regarding a Level 1 or Level 2 Assessment required under Subpart Y of this part must include the applicable definitions:

(i) *Level 1 Assessment:* A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

(ii) *Level 2 Assessment:* A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.

(d) * * *

(4) * * *

(iv) For contaminants subject to an MCL, except turbidity, total coliform, fecal coliform and *E. coli,* the highest contaminant level used to determine compliance with an NPDWR and the range of detected levels, as follows:

* * * * *

(vii) For total coliform analytical results until March 31, 2016:

* * * * *

(viii) For fecal coliform and *E. coli* until March 31, 2016: The total number of positive samples;

* * * * *

(x) For *E. coli* analytical results under subpart Y: The total number of positive samples.

* * * * *

(h) * * *

(7) *Systems required to comply with subpart Y.* (i) Any system required to comply with the Level 1 assessment requirement or a Level 2 assessment requirement that is not due to an *E. coli* MCL violation must include in the report the text found in paragraph (h)(7)(i)(A) and paragraphs (h)(7)(i)(B) and (C) of this section as appropriate, filling in the blanks accordingly and the text found in paragraphs (h)(7)(i)(D)(1) and (2) of this section if appropriate.

(A) Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(B) During the past year we were required to conduct [INSERT NUMBER OF LEVEL 1ASSESSMENTS] Level 1 assessment(s). [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s) were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

(C) During the past year [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were required to be completed for our water system. [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

(D) Any system that has failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

(*1*) During the past year we failed to conduct all of the required assessment(s).

(*2*) During the past year we failed to correct all identified defects that were found during the assessment.

(ii) Any system required to conduct a Level 2 assessment due to an *E. coli* MCL violation must include in the report the text found in paragraphs (h)(7)(ii)(A) and (B) of this section, filling in the blanks accordingly and the text found in paragraphs (h)(7)(ii)(C)(1) and (2) of this section, if appropriate.

(A) *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We found *E. coli* bacteria, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(B) We were required to complete a Level 2 assessment because we found *E. coli* in our water system. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

(C) Any system that has failed to complete the required assessment or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

(*1*) We failed to conduct the required assessment.

(*2*) We failed to correct all sanitary defects that were identified during the assessment that we conducted.

(iii) If a system detects *E. coli* and has violated the *E. coli MCL,* in addition to completing the table as required in paragraph (d)(4) of this section, the system must include one or more of the following statements to describe any noncompliance, as applicable:

(A) We had an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

(B) We had a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

(C) We failed to take all required repeat samples following an *E. coli*-positive routine sample.

(D) We failed to test for *E. coli* when any repeat sample tests positive for total coliform.

(iv) If a system detects *E. coli* and has not violated the *E. coli MCL,* in addition to completing the table as required in paragraph (d)(4) of this section, the system may include a statement that explains that although they have detected *E. coli,* they are not in violation of the *E. coli* MCL.

■ 11. Appendix A to Subpart O of Part 141 is amended as follows:

■ a. By revising the entries for ''Total Coliform Bacteria'' and ''Fecal Coliform and *E. coli,''*

■ b. By adding a second entry for ''Total Coliform Bacteria,''

■ c. By adding as a fourth entry ''*E. coli,''* and

■ d. By adding two endnotes before Endnote 1.

APPENDIX A TO SUBPART O OF PART 141—REGULATED CONTAMINANTS

Contaminant (units)	Traditional MCL in mg/L	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Microbiological contaminants:						
Total Coliform Bacteria †.	MCL (systems that collect ≥40 samples/month) 5% of monthly samples are positive; (systems that collect <40 samples/month) 1 positive monthly sample.	.....	MCL (systems that collect ≥40 samples/month) 5% of monthly samples are positive; (systems that collect <40 samples/month) 1 positive monthly sample..	0	Naturally present in the environment.	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.
Total Coliform Bacteria ‡.	TT	.....	TT	N/A	Naturally present in the environment.	Use language found in § 141.153(h)(7)(i)(A)
Fecal coliform and *E. coli* †.	0	.....	0	0	Human and animal fecal waste.	Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

APPENDIX A TO SUBPART O OF PART 141—REGULATED CONTAMINANTS—Continued

Contaminant (units)	Traditional MCL in mg/L	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
E. coli ‡	Routine and repeat samples are total coliform-positive and either is *E. coli*-positive or system fails to take repeat samples following *E. coli*-positive routine sample or system fails to analyze total coliform-positive repeat sample for *E. coli*.	.....	Routine and repeat samples are total coliform-positive and either is *E. coli*-positive or system fails to take repeat samples following *E. coli*-positive routine sample or system fails to analyze total coliform-positive repeat sample for *E. coli*.	0	Human and animal fecal waste.	*E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely-compromised immune systems.
*	*	*	*	*	*	*

† Until March 31, 2016.
‡ Beginning April 1, 2016.

* * * * *

■ 12. Section 141.202(a), Table 1, is amended by adding one sentence at the end of entry one (1) to read as follows:

§ 141.202 Tier 1 Public Notice—Form, manner, and frequency of notice.

* * * * *

TABLE 1 TO § 141.202—VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING A TIER 1 PUBLIC NOTICE

(1) * * * Violation of the MCL for *E. coli* (as specified in § 141.63(c));						
*	*	*	*	*	*	*

■ 13. Section 141.203(b)(2) is revised to read as follows:

§ 141.203 Tier 2 Public Notice—Form, manner, and frequency of notice.

* * * * *

(b) * * *

(2) The public water system must repeat the notice every three months as long as the violation or situation persists, unless the primacy agency determines that appropriate circumstances warrant a different repeat notice frequency. In no circumstance may the repeat notice be given less frequently than once per year. It is not appropriate for the primacy agency to allow less frequent repeat notice for an MCL or treatment technique violation under the Total Coliform Rule or subpart Y of this part or a treatment technique violation under the Surface Water Treatment Rule or Interim Enhanced Surface Water Treatment Rule. It is also not appropriate for the primacy agency to allow through its rules or policies across-the-board reductions in the repeat notice frequency for other ongoing violations requiring a Tier 2 repeat notice. Primacy agency determinations allowing repeat notices to be given less frequently than once every three months must be in writing.

* * * * *

■ 14. Section 141.204(a), Table 1, is amended by revising entries (4) and (5) and adding entry (6) to read as follows:

§ 141.204 Tier 3 Public Notice—Form, manner, frequency of notice.

(a) * * *

TABLE 1 TO § 141.204—VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING A TIER 3 PUBLIC NOTICE

*	*	*	*	*	*	*
(4) Availability of unregulated contaminant monitoring results, as required under § 141.207;						
(5) Exceedance of the fluoride secondary maximum contaminant level (SMCL), as required under § 141.208; and						
(6) Reporting and Recordkeeping violations under subpart Y of 40 CFR part 141.						

* * * * *

■ 15. Appendix A to subpart Q of Part 141 is amended as follows:

■ a. By revising entries I.A.1 and I.A.2,

■ b. By adding two endnotes before Endnote 1, and

■ c. By revising Endnote 1.

APPENDIX A TO SUBPART Q OF PART 141—NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE [1]

Contaminant	MCL/MRDL/TT violations [2]		Monitoring, testing & reporting procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
I. Violations of National Primary Drinking Water Regulations (NPDWR): [3].				
A. Microbiological Contaminants.				
1.a Total coliform bacteria †	2	141.63(a)	3	141.21(a)–(e)
1.b Total coliform (Monitoring or TT violations resulting from failure to perform assessments or corrective actions) ‡	2	141.860(b)	3	141.860(c)
1.c Seasonal system failure to follow State-approved start-up plan prior to serving water to the public. ‡	2	141.860(b)(2)		
2.a Fecal coliform/*E. coli* †	1	141.63(b)	[4] 1,3	141.21(e)
2.b *E. coli* ‡	1	141.860 (a)	3	141.860(c) 141.860(d)(2)
2.c *E.coli* (TT violations resulting from failure to perform level 2 Assessments or corrective action) ‡	2	141.860(b)		
* * *	*	*	*	*

Appendix A—Endnotes

† Until March 31, 2016.

‡ Beginning April 1, 2016.

1. Violations and other situations not listed in this table (e.g., failure to prepare Consumer Confidence Reports), do not require notice, unless otherwise determined by the primacy agency. Primacy agencies may, at their option, also require a more stringent public notice tier (e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Appendix, as authorized under § 141.202(a) and § 141.203(a).

2. MCL—Maximum contaminant level, MRDL—Maximum residual disinfectant level, TT—Treatment technique

3. The term Violations of National Primary Drinking Water Regulations (NPDWR) is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.

4. Failure to test for fecal coliform or E. coli is a Tier 1 violation if testing is not done after any repeat sample tests positive for coliform. All other total coliform monitoring and testing procedure violations are Tier 3.

* * * * *

■ 16. Appendix B to subpart Q of Part 141 is amended as follows:

■ a. By revising entries 1a and 1b,

■ b. By adding entries 1e, 1f, 1g and 1h, and

■ c. By adding two endnotes before Endnote 1.

APPENDIX B TO SUBPART Q OF PART 141—STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

Contaminant	MCLG[1]mg/L	MCL[2]mg/L	Standard health effects language for public notification
National Primary Drinking Water Regulations (NPDWR)			
A. Microbiological Contaminants			
1a. Total coliform †	Zero	See footnote [3]	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.
1b. Fecal coliform/*E. coli* †	Zero	Zero	Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

APPENDIX B TO SUBPART Q OF PART 141—STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION—Continued

Contaminant	MCLG[1]mg/L	MCL[2]mg/L	Standard health effects language for public notification
*	* *	*	* * *
1e. Subpart Y Coliform Assessment and/or Corrective Action Violations ‡.	N/A	TT	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessments to identify problems and to correct any problems that are found. [THE SYSTEM MUST USE THE FOLLOWING APPLICABLE SENTENCES.] We failed to conduct the required assessment. We failed to correct all identified sanitary defects that were found during the assessment(s).
1f. Subpart Y *E.coli* Assessment and/or Corrective Action Violations ‡.	N/A	TT	*E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We violated the standard for *E. coli,* indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct a detailed assessment to identify problems and to correct any problems that are found. [THE SYSTEM MUST USE THE FOLLOWING APPLICABLE SENTENCES.] We failed to conduct the required assessment. We failed to correct all identified sanitary defects that were found during the assessment that we conducted.
1g. *E. coli* ‡	Zero	In compliance unless one of the following conditions occurs:. (1) The system has an *E. coli*-positive repeat sample following a total coliform-positive routine sample.. (2) The system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample.. (3) The system fails to take all required repeat samples following an *E. coli*-positive routine sample.. (4) The system fails to test for *E. coli* when any repeat sample tests positive for total coliform..	*E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems.
1h. Subpart Y Seasonal System TT Violations ‡.	N/A	TT	When this violation includes the failure to monitor for total coliforms or *E. coli* prior to serving water to the public, the mandatory language found at 141.205(d)(2) must be used. When this violation includes failure to complete other actions, the appropriate elements found in 141.205(a) to describe the violation must be used.
*	* *	*	* * *

Appendix B—Endnotes

† Until March 31, 2016.
‡ Beginning April 1, 2016.
1. MCLG—Maximum contaminant level goal
2. MCL—Maximum contaminant level
3. For water systems analyzing at least 40 samples per month, no more than 5.0 percent of the monthly samples may be positive for total coliforms. For systems analyzing fewer than 40 samples per month, no more than one sample per month may be positive for total coliforms.

* * * * *

■ 17. Section 141.402 is amended by revising paragraph (a) to read as follows:

§ 141.402 Ground water source microbial monitoring and analytical methods.

(a) *Triggered source water monitoring—*

(1) *General requirements.* A ground water system must conduct triggered source water monitoring if the conditions identified in paragraphs (a)(1)(i) and either (a)(1)(ii) or (a)(1)(iii) of this section exist.

(i) The system does not provide at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source; and either

(ii) The system is notified that a sample collected under § 141.21(a) is total coliform-positive and the sample is not invalidated under § 141.21(c) until March 31, 2016, or

(iii) The system is notified that a sample collected under §§ 141.854 through 141.857 is total coliform-positive and the sample is not invalidated under § 141.853(c) beginning April 1, 2016.

(2) *Sampling requirements.* A ground water system must collect, within 24 hours of notification of the total coliform-positive sample, at least one ground water source sample from each ground water source in use at the time the total coliform-positive sample was collected under § 141.21(a) until March 31, 2016, or collected under §§ 141.854 through 141.857 beginning April 1, 2016, except as provided in paragraph (a)(2)(ii) of this section.

(i) The State may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the ground water source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the State must specify how much time the system has to collect the sample.

(ii) If approved by the State, systems with more than one ground water source may meet the requirements of this paragraph (a)(2) by sampling a representative ground water source or sources. If directed by the State, systems must submit for State approval a triggered source water monitoring plan that identifies one or more ground water sources that are representative of each monitoring site in the system's sample siting plan under § 141.21(a) until March 31, 2016, or under § 141.853 beginning April 1, 2016, and that the system intends to use for representative sampling under this paragraph.

(iii) Until March 31, 2016, a ground water system serving 1,000 or fewer people may use a repeat sample collected from a ground water source to meet both the requirements of § 141.21(b) and to satisfy the monitoring requirements of paragraph (a)(2) of this section for that ground water source only if the State approves the use of *E. coli* as a fecal indicator for source water monitoring under this paragraph (a). If the repeat sample collected from the ground water source is *E. coli*-positive, the system must comply with paragraph (a)(3) of this section.

(iv) Beginning April 1, 2016, a ground water system serving 1,000 or fewer people may use a repeat sample collected from a ground water source to meet both the requirements of subpart Y and to satisfy the monitoring requirements of paragraph (a)(2) of this section for that ground water source only if the State approves the use of *E. coli* as a fecal indicator for source water monitoring under this paragraph (a) and approves the use of a single sample for meeting both the triggered source water monitoring requirements in this paragraph (a) and the repeat monitoring requirements in § 141.858. If the repeat sample collected from the ground water source is *E. coli*- positive, the system must comply with paragraph (a)(3) of this section.

(3) *Additional requirements.* If the State does not require corrective action under § 141.403(a)(2) for a fecal indicator-positive source water sample collected under paragraph (a)(2) of this section that is not invalidated under paragraph (d) of this section, the system must collect five additional source water samples from the same source within 24 hours of being notified of the fecal indicator-positive sample.

(4) *Consecutive and wholesale systems.* (i) In addition to the other requirements of this paragraph (a), a consecutive ground water system that has a total coliform-positive sample collected under § 141.21(a) until March 31, 2016, or under §§ 141.854 through 141.857 beginning April 1, 2016, must notify the wholesale system(s) within 24 hours of being notified of the total coliform-positive sample.

(ii) In addition to the other requirements of this paragraph (a), a wholesale ground water system must comply with paragraphs (a)(4)(ii)(A) and (a)(4)(ii)(B) of this section.

(A) A wholesale ground water system that receives notice from a consecutive system it serves that a sample collected under § 141.21(a) until March 31, 2016, or collected under §§ 141.854 through 141.857 beginning April 1, 2016, is total coliform-positive must, within 24 hours of being notified, collect a sample from its ground water source(s) under paragraph (a)(2) of this section and analyze it for a fecal indicator under paragraph (c) of this section.

(B) If the sample collected under paragraph (a)(4)(ii)(A) of this section is fecal indicator-positive, the wholesale ground water system must notify all consecutive systems served by that ground water source of the fecal indicator source water positive within 24 hours of being notified of the ground water source sample monitoring result and must meet the requirements of paragraph (a)(3) of this section.

(5) *Exceptions to the triggered source water monitoring requirements.* A ground water system is not required to comply with the source water monitoring requirements of paragraph (a) of this section if either of the following conditions exists:

(i) The State determines, and documents in writing, that the total coliform-positive sample collected under § 141.21(a) until March 31, 2016, or under §§ 141.854 through 141.857 beginning April 1, 2016, is caused by a distribution system deficiency; or

(ii) The total coliform-positive sample collected under § 141.21(a) until March 31, 2016, or under §§ 141.854 through 141.857 beginning April 1, 2016, is collected at a location that meets State criteria for distribution system conditions that will cause total coliform-positive samples.

* * * * *

■ 18. Section 141.405 is amended by revising paragraph (b)(4) to read as follows:

§ 141.405 Reporting and recordkeeping for ground water systems.

* * * * *

(b) * * *

(4) For consecutive systems, documentation of notification to the wholesale system(s) of total coliform-positive samples that are not invalidated under § 141.21(c) until March 31, 2016, or under § 141.853 beginning April 1,

2016. Documentation shall be kept for a period of not less than five years.

* * * * *

■ 19. Section 141.803 is amended by revising paragraphs (a)(3) and (a)(5) to read as follows:

§ 141.803 Coliform sampling.

(a) * * *

(3) Air carriers must conduct analyses for total coliform and *E. coli* in accordance with the analytical methods approved in § 141.21(f)(3) and 141.21(f)(6)) until March 31, 2016, and in accordance with the analytical methods approved in § 141.852 beginning April 1, 2016.

* * * * *

(5) The invalidation of a total coliform sample result can be made only by the Administrator in accordance with § 141.21(c)(1)(i), (ii), or (iii) or by the certified laboratory in accordance with § 141.21(c)(2) until March 31, 2016, or in accordance with § 141.853(c) beginning April 1, 2016, with the Administrator acting as the State.

* * * * *

■ 20. Part 141 is amended by adding a new subpart Y to read as follows:

Subpart Y—Revised Total Coliform Rule

Sec.
141.851 General.
141.852 Analytical methods and laboratory certification.
141.853 General monitoring requirements for all public water systems.
141.854 Routine monitoring requirements for non-community water systems serving 1,000 or fewer people using only ground water.
141.855 Routine monitoring requirements for community water systems serving 1,000 or fewer people using only ground water.
141.856 Routine monitoring requirements for subpart H public water systems of this part serving 1,000 or fewer people.
141.857 Routine monitoring requirements for public water systems serving more than 1,000 people.
141.858 Repeat monitoring and *E. coli* requirements.
141.859 Coliform treatment technique triggers and assessment requirements for protection against potential fecal contamination.
141.860 Violations.
141.861 Reporting and recordkeeping.

Subpart Y—Revised Total Coliform Rule

§ 141.851 General.

(a) *General.* The provisions of this subpart include both maximum contaminant level and treatment technique requirements.

(b) *Applicability.* The provisions of this subpart apply to all public water systems.

(c) *Compliance date.* Systems must comply with the provisions of this subpart beginning April 1, 2016, unless otherwise specified in this subpart.

(d) *Implementation with EPA as State.* Systems falling under direct oversight of EPA, where EPA acts as the State, must comply with decisions made by EPA for implementation of subpart Y. EPA has authority to establish such procedures and criteria as are necessary to implement subpart Y.

(e) *Violations of national primary drinking water regulations.* Failure to comply with the applicable requirements of §§ 141.851 through 141.861, including requirements established by the State pursuant to these provisions, is a violation of the national primary drinking water regulations under subpart Y.

§ 141.852 Analytical methods and laboratory certification.

(a) *Analytical methodology.* (1) The standard sample volume required for analysis, regardless of analytical method used, is 100 ml.

(2) Systems need only determine the presence or absence of total coliforms and *E. coli;* a determination of density is not required.

(3) The time from sample collection to initiation of test medium incubation may not exceed 30 hours. Systems are encouraged but not required to hold samples below 10 deg. C during transit.

(4) If water having residual chlorine (measured as free, combined, or total chlorine) is to be analyzed, sufficient sodium thiosulfate ($Na_2S_2O_3$) must be added to the sample bottle before sterilization to neutralize any residual chlorine in the water sample. Dechlorination procedures are addressed in Section 9060A.2 of *Standard Methods for the Examination of Water and Wastewater* (20th and 21st editions).

(5) Systems must conduct total coliform and *E. coli* analyses in accordance with one of the analytical methods in the following table or one of the alternative methods listed in Appendix A to subpart C of part 141.

Organism	Methodology category	Method [1]	Citation [1]
Total Coliforms	Lactose Fermentation Methods	Standard Total Coliform Fermentation Technique.	Standard Methods 9221 B.1, B.2 (20th ed.; 21st ed.) [2 3] Standard Methods Online 9221 B.1, B.2–99 [2 3]
		Presence-Absence (P–A) Coliform Test.	Standard Methods 9221 D.1, D.2 (20th ed.; 21st ed.) [2 7] Standard Methods Online 9221 D.1, D.2–99 [2 7]
	Membrane Filtration Methods	Standard Total Coliform Membrane Filter Procedure.	Standard Methods 9222 B, C (20th ed.; 21st ed.) [2 4] Standard Methods Online 9222 B–97 [2 4], 9222 C–97 [2 4]
		Membrane Filtration using MI medium.	EPA Method 1604 [2]
		m-ColiBlue24® Test [2 4]	
		Chromocult [2 4].	
	Enzyme Substrate Methods	Colilert®	Standard Methods 9223 B (20th ed.; 21st ed.) [2 5] Standard Methods Online 9223 B–97 [2 5]
		Colisure®	Standard Methods 9223 B (20th ed.; 21st ed.) [2 5 6] Standard Methods Online 9223 B–97 [2 5 6]
		E*Colite® Test [2].	
		Readycult® Test [2].	

Organism	Methodology category	Method [1]	Citation [1]
Escherichia coli.		modified Colitag® Test [2].	
	Escherichia coli Procedure (following Lactose Fermentation Methods).	EC–MUG medium	Standard Methods 9221 F.1 (20th ed.; 21st ed.) [2]
	Escherichia coli Partition Method	EC broth with MUG (EC–MUG)	Standard Methods 9222 G.1*c*(2) (20th ed.; 21st ed.) [2 8]
		NA–MUG medium	Standard Methods 9222 G.1*c*(1) (20th ed.; 21st ed.) [2]
	Membrane Filtration Methods	Membrane Filtration using MI medium.	EPA Method 1604 [2]
		m-ColiBlue24® Test [2 4]	
		Chromocult [2 4].	
	Enzyme Substrate Methods	Colilert®	Standard Methods 9223 B (20th ed.; 21st ed.) [2 5] Standard Methods Online 9223 B–97 [2 5 6]
		Colisure®	Standard Methods 9223 B (20th ed.; 21st ed.) [2 5 6] Standard Methods Online 9223 B–97 [2 5 6]
		E*Colite® Test [2].	
		Readycult® Test [2].	
		modified Colitag® Test [2].	

[1] The procedures must be done in accordance with the documents listed in paragraph (c) of this section. For Standard Methods, either editions, 20th (1998) or 21st (2005), may be used. For the Standard Methods Online, the year in which each method was approved by the Standard Methods Committee is designated by the last two digits following the hyphen in the method number. The methods listed are the only online versions that may be used. For vendor methods, the date of the method listed in paragraph (c) of this section is the date/version of the approved method. The methods listed are the only versions that may be used for compliance with this rule. Laboratories should be careful to use only the approved versions of the methods, as product package inserts may not be the same as the approved versions of the methods.

[2] Incorporated by reference. See paragraph (c) of this section.

[3] Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the water normally tested, and if the findings from this comparison demonstrate that the false-positive rate and false-negative rate for total coliforms, using lactose broth, is less than 10 percent.

[4] All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving. Exposure of filtration equipment to UV light is not adequate to ensure sterilization. Subsequent to the initial autoclaving, exposure of the filtration equipment to UV light may be used to sanitize the funnels between filtrations within a filtration series. Alternatively, membrane filtration equipment that is pre-sterilized by the manufacturer (i.e., disposable funnel units) may be used.

[5] Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.

[6] Colisure® results may be read after an incubation time of 24 hours.

[7] A multiple tube enumerative format, as described in *Standard Methods for the Examination of Water and Wastewater* 9221, is approved for this method for use in presence-absence determination under this regulation.

[8] The following changes must be made to the EC broth with MUG (EC–MUG) formulation: Potassium dihydrogen phosphate, KH_2PO_4, must be 1.5g, and 4-methylumbelliferyl-Beta-D-glucuronide must be 0.05 g.

(b) *Laboratory certification.* Systems must have all compliance samples required under this subpart analyzed by a laboratory certified by the EPA or a primacy State to analyze drinking water samples. The laboratory used by the system must be certified for each method (and associated contaminant(s)) used for compliance monitoring analyses under this rule.

(c) *Incorporation by reference.* The standards required in this section are incorporated by reference into this section with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, EPA must publish notice of change in the **Federal Register** and the material must be available to the public. All approved material is available for inspection either electronically at *www.regulations.gov,* in hard copy at the Water Docket, or from the sources indicated below. The Docket ID is EPA–HQ–OW–2008–0878. Hard copies of these documents may be viewed at the Water Docket in the EPA Docket Center, (EPA/DC) EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is 1–202–566–1744, and the telephone number for the Water Docket is 1–202–566–2426. Copyrighted materials are only available for viewing in hard copy. These documents are also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 1–202–741–6030 or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(1) American Public Health Association, 800 I Street, NW., Washington, DC 20001.

(i) ''Standard Methods for the Examination of Water and Wastewater,'' 20th edition (1998):

(A) Standard Methods 9221, ''Multiple-Tube Fermentation Technique for Members of the Coliform Group,'' B.1, B.2, ''Standard Total Coliform Fermentation Technique.''

(B) Standard Methods 9221, ''Multiple-Tube Fermentation Technique for Members of the Coliform Group,'' D.1, D.2, ''Presence-Absence (P–A) Coliform Test.''

(C) Standard Methods 9222, ''Membrane Filter Technique for Members of the Coliform Group,'' B, ''Standard Total Coliform Membrane Filter Procedure.''

(D) Standard Methods 9222, ''Membrane Filter Technique for Members of the Coliform Group,'' C,

''Delayed-Incubation Total Coliform Procedure.''

(E) Standard Methods 9223, ''Enzyme Substrate Coliform Test,'' B, ''Enzyme Substrate Test,'' Colilert® and Colisure®.

(F) Standard Methods 9221, ''Multiple Tube Fermentation Technique for Members of the Coliform Group,'' F.1, ''*Escherichia coli* Procedure: EC–MUG medium.''

(G) Standard Methods 9222, ''Membrane Filter Technique for Members of the Coliform Group,'' G.1.*c*(2), ''*Escherichia coli* Partition Method: EC broth with MUG (EC–MUG).''

(H) Standard Methods 9222, ''Membrane Filter Technique for Members of the Coliform Group,'' G.1.*c*(1), ''*Escherichia coli* Partition Method: NA–MUG medium.''

(ii) ''Standard Methods for the Examination of Water and Wastewater,'' 21st edition (2005):

(A) Standard Methods 9221, ''Multiple-Tube Fermentation Technique for Members of the Coliform Group,'' B.1, B.2, ''Standard Total Coliform Fermentation Technique.''

(B) Standard Methods 9221, ''Multiple-Tube Fermentation Technique for Members of the Coliform Group,'' D.1, D.2, ''Presence-Absence (P–A) Coliform Test.''

(C) Standard Methods 9222, ''Membrane Filter Technique for Members of the Coliform Group,'' B, ''Standard Total Coliform Membrane Filter Procedure.''

(D) Standard Methods 9222, ''Membrane Filter Technique for Members of the Coliform Group,'' C, ''Delayed-Incubation Total Coliform Procedure.''

(E) Standard Methods 9223, ''Enzyme Substrate Coliform Test,'' B, ''Enzyme Substrate Test,'' Colilert® and Colisure®.

(F) Standard Methods 9221, ''Multiple Tube Fermentation Technique for Members of the Coliform Group,'' F.1, ''*Escherichia coli* Procedure: EC–MUG medium.''

(G) Standard Methods 9222, ''Membrane Filter Technique for Members of the Coliform Group,'' G.1.*c*(2), ''*Escherichia coli* Partition Method: EC broth with MUG (EC–MUG).''

(H) Standard Methods 9222, ''Membrane Filter Technique for Members of the Coliform Group,'' G.1.*c*(1), ''*Escherichia coli* Partition Method: NA–MUG medium.''

(iii) ''Standard Methods Online'' available at *http://www.standardmethods.org:*

(A) Standard Methods Online 9221, ''Multiple-Tube Fermentation Technique for Members of the Coliform Group'' (1999), B.1, B.2–99, ''Standard Total Coliform Fermentation Technique.''

(B) Standard Methods Online 9221, ''Multiple-Tube Fermentation Technique for Members of the Coliform Group'' (1999), D.1, D.2–99, ''Presence-Absence (P–A) Coliform Test.''

(C) Standard Methods Online 9222, ''Membrane Filter Technique for Members of the Coliform Group'' (1997), B–97, ''Standard Total Coliform Membrane Filter Procedure.''

(D) Standard Methods Online 9222, ''Membrane Filter Technique for Members of the Coliform Group'' (1997), C–97, ''Delayed-Incubation Total Coliform Procedure.''

(E) Standard Methods Online 9223, ''Enzyme Substrate Coliform Test'' (1997), B–97, ''Enzyme Substrate Test'', Colilert® and Colisure®.

(2) Charm Sciences, Inc., 659 Andover Street, Lawrence, MA 01843–1032, telephone 1–800–343–2170:

(i) E*Colite®—''Charm E*Colite™ Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Drinking Water,'' January 9, 1998.

(ii) [Reserved]

(3) CPI International, Inc., 5580 Skylane Blvd., Santa Rosa, CA, 95403, telephone 1–800–878–7654:

(i) modified Colitag®, ATP D05–0035—''Modified Colitag™ Test Method for the Simultaneous Detection of *E. coli* and other Total Coliforms in Water,'' August 28, 2009.

(ii) [Reserved]

(4) EMD Millipore (a division of Merck KGaA, Darmstadt Germany), 290 Concord Road, Billerica, MA 01821, telephone 1–800–645–5476:

(i) Chromocult—''Chromocult® Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and *Escherichia coli* for Finished Waters,'' November 2000, Version 1.0.

(ii) Readycult®—''Readycult® Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Finished Waters,'' January 2007, Version 1.1.

(5) EPA's Water Resource Center (MC–4100T), 1200 Pennsylvania Avenue NW., Washington, DC 20460, telephone 1–202–566–1729:

(i) EPA Method 1604, EPA 821–R–02–024—''EPA Method 1604: Total Coliforms and *Escherichia coli* in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium),'' September 2002, *http://www.epa.gov/nerlcwww/1604sp02.pdf.*

(ii) [Reserved]

(6) Hach Company, P.O. Box 389, Loveland, CO 80539, telephone 1–800–604–3493:

(i) m-ColiBlue24®—''Membrane Filtration Method m-ColiBlue24® Broth,'' Revision 2, August 17, 1999.

(ii) [Reserved]

§ 141.853 General monitoring requirements for all public water systems.

(a) *Sample siting plans.* (1) Systems must develop a written sample siting plan that identifies sampling sites and a sample collection schedule that are representative of water throughout the distribution system not later than March 31, 2016. These plans are subject to State review and revision. Systems must collect total coliform samples according to the written sample siting plan. Monitoring required by §§ 141.854 through 141.858 may take place at a customer's premise, dedicated sampling station, or other designated compliance sampling location. Routine and repeat sample sites and any sampling points necessary to meet the requirements of subpart S must be reflected in the sampling plan.

(2) Systems must collect samples at regular time intervals throughout the month, except that systems that use only ground water and serve 4,900 or fewer people may collect all required samples on a single day if they are taken from different sites.

(3) Systems must take at least the minimum number of required samples even if the system has had an *E. coli* MCL violation or has exceeded the coliform treatment technique triggers in § 141.859(a).

(4) A system may conduct more compliance monitoring than is required by this subpart to investigate potential problems in the distribution system and use monitoring as a tool to assist in uncovering problems. A system may take more than the minimum number of required routine samples and must include the results in calculating whether the coliform treatment technique trigger in § 141.859(a)(1)(i) and (ii) has been exceeded only if the samples are taken in accordance with the existing sample siting plan and are representative of water throughout the distribution system.

(5) Systems must identify repeat monitoring locations in the sample siting plan. Unless the provisions of paragraphs (a)(5)(i) or (a)(5)(ii) of this section are met, the system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample

at a tap within five service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system, the system must still take all required repeat samples. However, the State may allow an alternative sampling location in lieu of the requirement to collect at least one repeat sample upstream or downstream of the original sampling site. Except as provided for in paragraph (a)(5)(ii) of this section, systems required to conduct triggered source water monitoring under § 141.402(a) must take ground water source sample(s) in addition to repeat samples required under this subpart.

(i) Systems may propose repeat monitoring locations to the State that the system believes to be representative of a pathway for contamination of the distribution system. A system may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a standard operating procedure (SOP) in its sample siting plan. The system must design its SOP to focus the repeat samples at locations that best verify and determine the extent of potential contamination of the distribution system area based on specific situations. The State may modify the SOP or require alternative monitoring locations as needed.

(ii) Ground water systems serving 1,000 or fewer people may propose repeat sampling locations to the State that differentiate potential source water and distribution system contamination (e.g., by sampling at entry points to the distribution system). A ground water system with a single well required to conduct triggered source water monitoring may, with written State approval, take one of its repeat samples at the monitoring location required for triggered source water monitoring under § 141.402(a) if the system demonstrates to the State's satisfaction that the sample siting plan remains representative of water quality in the distribution system. If approved by the State, the system may use that sample result to meet the monitoring requirements in both § 141.402(a) and this section.

(A) If a repeat sample taken at the monitoring location required for triggered source water monitoring is *E. coli*-positive, the system has violated the *E. coli* MCL and must also comply with § 141.402(a)(3). If a system takes more than one repeat sample at the monitoring location required for triggered source water monitoring, the system may reduce the number of additional source water samples required under § 141.402(a)(3) by the number of repeat samples taken at that location that were not *E. coli*-positive.

(B) If a system takes more than one repeat sample at the monitoring location required for triggered source water monitoring under § 141.402(a), and more than one repeat sample is *E. coli*-positive, the system has violated the *E. coli* MCL and must also comply with § 141.403(a)(1).

(C) If all repeat samples taken at the monitoring location required for triggered source water monitoring are *E. coli*-negative and a repeat sample taken at a monitoring location other than the one required for triggered source water monitoring is *E. coli*-positive, the system has violated the *E. coli* MCL, but is not required to comply with § 141.402(a)(3).

(6) States may review, revise, and approve, as appropriate, repeat sampling proposed by systems under paragraphs (a)(5)(i) and (ii) of this section. The system must demonstrate that the sample siting plan remains representative of the water quality in the distribution system. The State may determine that monitoring at the entry point to the distribution system (especially for undisinfected ground water systems) is effective to differentiate between potential source water and distribution system problems.

(b) *Special purpose samples.* Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, must not be used to determine whether the coliform treatment technique trigger has been exceeded. Repeat samples taken pursuant to § 141.858 are not considered special purpose samples, and must be used to determine whether the coliform treatment technique trigger has been exceeded.

(c) *Invalidation of total coliform samples.* A total coliform-positive sample invalidated under this paragraph (c) of this section does not count toward meeting the minimum monitoring requirements of this subpart.

(1) The State may invalidate a total coliform-positive sample only if the conditions of paragraph (c)(1)(i), (ii), or (iii) of this section are met.

(i) The laboratory establishes that improper sample analysis caused the total coliform-positive result.

(ii) The State, on the basis of the results of repeat samples collected as required under § 141.858(a), determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The State cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected at a location other than the original tap are total coliform-negative (e.g., a State cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative, or if the system has only one service connection).

(iii) The State has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition that does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required under § 141.858(a), and use them to determine whether a coliform treatment technique trigger in § 141.859 has been exceeded. To invalidate a total coliform-positive sample under this paragraph, the decision and supporting rationale must be documented in writing, and approved and signed by the supervisor of the State official who recommended the decision. The State must make this document available to EPA and the public. The written documentation must state the specific cause of the total coliform-positive sample, and what action the system has taken, or will take, to correct this problem. The State may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(2) A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique), produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P–A) Coliform Test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the system must collect another sample from the same location as the original sample within 24 hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The system must continue to re-sample within 24 hours and have the samples analyzed until it obtains a valid result. The State may waive the 24-hour time limit on a case-by-case basis. Alternatively, the State may implement criteria for waiving the 24-hour

sampling time limit to use in lieu of case-by-case extensions.

§ 141.854 Routine monitoring requirements for non-community water systems serving 1,000 or fewer people using only ground water.

(a) *General.* (1) The provisions of this section apply to non-community water systems using only ground water (except ground water under the direct influence of surface water, as defined in § 141.2) and serving 1,000 or fewer people.

(2) Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in § 141.858.

(3) Once all monitoring required by this section and § 141.858 for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in § 141.859 have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by § 141.859.

(4) For the purpose of determining eligibility for remaining on or qualifying for quarterly monitoring under the provisions of paragraphs (f)(4) and (g)(2), respectively, of this section for transient non-community water systems, the State may elect to not count monitoring violations under § 141.860(c)(1) of this part if the missed sample is collected no later than the end of the monitoring period following the monitoring period in which the sample was missed. The system must collect the make-up sample in a different week than the routine sample for that monitoring period and should collect the sample as soon as possible during the monitoring period. The State may not use this provision under paragraph (h) of this section. This authority does not affect the provisions of §§ 141.860(c)(1) and 141.861(a)(4) of this part.

(b) *Monitoring frequency for total coliforms.* Systems must monitor each calendar quarter that the system provides water to the public, except for seasonal systems or as provided under paragraphs (c) through (h) and (j) of this section. Seasonal systems must meet the monitoring requirements of paragraph (i) of this section.

(c) *Transition to subpart Y.* (1) Systems, including seasonal systems, must continue to monitor according to the total coliform monitoring schedules under § 141.21 that were in effect on March 31, 2016, unless any of the conditions for increased monitoring in paragraph (f) of this section are triggered on or after April 1, 2016, or unless otherwise directed by the State.

(2) Beginning April 1, 2016, the State must perform a special monitoring evaluation during each sanitary survey to review the status of the system, including the distribution system, to determine whether the system is on an appropriate monitoring schedule. After the State has performed the special monitoring evaluation during each sanitary survey, the State may modify the system's monitoring schedule, as necessary, or it may allow the system to stay on its existing monitoring schedule, consistent with the provisions of this section. The State may not allow systems to begin less frequent monitoring under the special monitoring evaluation unless the system has already met the applicable criteria for less frequent monitoring in this section. For seasonal systems on quarterly or annual monitoring, this evaluation must include review of the approved sample siting plan, which must designate the time period(s) for monitoring based on site-specific considerations (e.g., during periods of highest demand or highest vulnerability to contamination). The seasonal system must collect compliance samples during these time periods.

(d) *Annual site visits.* Beginning no later than calendar year 2017, systems on annual monitoring, including seasonal systems, must have an initial and recurring annual site visit by the State that is equivalent to a Level 2 assessment or an annual voluntary Level 2 assessment that meets the criteria in § 141.859(b) to remain on annual monitoring. The periodic required sanitary survey may be used to meet the requirement for an annual site visit for the year in which the sanitary survey was completed.

(e) *Criteria for annual monitoring.* Beginning April 1, 2016, the State may reduce the monitoring frequency for a well-operated ground water system from quarterly routine monitoring to no less than annual monitoring, if the system demonstrates that it meets the criteria for reduced monitoring in paragraphs (e)(1) through (e)(3) of this section, except for a system that has been on increased monitoring under the provisions of paragraph (f) of this section. A system on increased monitoring under paragraph (f) of this section must meet the provisions of paragraph (g) of this section to go to quarterly monitoring and must meet the provisions of paragraph (h) of this section to go to annual monitoring.

(1) The system has a clean compliance history for a minimum of 12 months;

(2) The most recent sanitary survey shows that the system is free of sanitary defects or has corrected all identified sanitary defects, has a protected water source, and meets approved construction standards; and

(3) The State has conducted an annual site visit within the last 12 months and the system has corrected all identified sanitary defects. The system may substitute a Level 2 assessment that meets the criteria in § 141.859(b) for the State annual site visit.

(f) *Increased Monitoring Requirements for systems on quarterly or annual monitoring.* A system on quarterly or annual monitoring that experiences any of the events identified in paragraphs (f)(1) through (f)(4) of this section must begin monthly monitoring the month following the event. A system on annual monitoring that experiences the event identified in paragraphs (f)(5) of this section must begin quarterly monitoring the quarter following the event. The system must continue monthly or quarterly monitoring until the requirements in paragraph (g) of this section for quarterly monitoring or paragraph (h) of this section for annual monitoring are met. A system on monthly monitoring for reasons other than those identified in paragraphs (f)(1) through (f)(4) of this section is not considered to be on increased monitoring for the purposes of paragraphs (g) and (h) of this section.

(1) The system triggers a Level 2 assessment or two Level 1 assessments under the provisions of § 141.859 in a rolling 12-month period.

(2) The system has an *E. coli* MCL violation.

(3) The system has a coliform treatment technique violation.

(4) The system has two subpart Y monitoring violations or one subpart Y monitoring violation and one Level 1 assessment under the provisions of § 141.859 in a rolling 12-month period for a system on quarterly monitoring.

(5) The system has one subpart Y monitoring violation for a system on annual monitoring.

(g) *Requirements for returning to quarterly monitoring.* The State may reduce the monitoring frequency for a system on monthly monitoring triggered under paragraph (f) of this section to quarterly monitoring if the system meets the criteria in paragraphs (g)(1) and (g)(2) of this section.

(1) Within the last 12 months, the system must have a completed sanitary survey or a site visit by the State or a voluntary Level 2 assessment by a party approved by the State, be free of sanitary defects, and have a protected water source; and

(2) The system must have a clean compliance history for a minimum of 12 months.

(h) *Requirements for systems on increased monitoring to qualify for annual monitoring.* The State may reduce the monitoring frequency for a system on increased monitoring under paragraph (f) of this section if the system meets the criteria in paragraph (g) of this section plus the criteria in paragraphs (h)(1) and (h)(2) of this section.

(1) An annual site visit by the State and correction of all identified sanitary defects. The system may substitute a voluntary Level 2 assessment by a party approved by the State for the State annual site visit in any given year.

(2) The system must have in place or adopt one or more additional enhancements to the water system barriers to contamination in paragraphs (h)(2)(i) through (h)(2)(v) of this section.

(i) Cross connection control, as approved by the State.

(ii) An operator certified by an appropriate State certification program or regular visits by a circuit rider certified by an appropriate State certification program.

(iii) Continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the State.

(iv) Demonstration of maintenance of at least a 4-log removal or inactivation of viruses as provided for under § 141.403(b)(3).

(v) Other equivalent enhancements to water system barriers as approved by the State.

(i) *Seasonal systems.* (1) Beginning April 1, 2016, all seasonal systems must demonstrate completion of a State-approved start-up procedure, which may include a requirement for startup sampling prior to serving water to the public.

(2) A seasonal system must monitor every month that it is in operation unless it meets the criteria in paragraphs (i)(2)(i) through (iii) of this section to be eligible for monitoring less frequently than monthly beginning April 1, 2016, except as provided under paragraph (c) of this section.

(i) Seasonal systems monitoring less frequently than monthly must have an approved sample siting plan that designates the time period for monitoring based on site-specific considerations (e.g., during periods of highest demand or highest vulnerability to contamination). Seasonal systems must collect compliance samples during this time period.

(ii) To be eligible for quarterly monitoring, the system must meet the criteria in paragraph (g) of this section.

(iii) To be eligible for annual monitoring, the system must meet the criteria under paragraph (h) of this section.

(3) The State may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating, except that systems that monitor less frequently than monthly must still monitor during the vulnerable period designated by the State.

(j) *Additional routine monitoring the month following a total coliform-positive sample.* Systems collecting samples on a quarterly or annual frequency must conduct additional routine monitoring the month following one or more total coliform-positive samples (with or without a Level 1 treatment technique trigger). Systems must collect at least three routine samples during the next month, except that the State may waive this requirement if the conditions of paragraph (j)(1), (2), or (3) of this section are met. Systems may either collect samples at regular time intervals throughout the month or may collect all required routine samples on a single day if samples are taken from different sites. Systems must use the results of additional routine samples in coliform treatment technique trigger calculations under § 141.859(a).

(1) The State may waive the requirement to collect three routine samples the next month in which the system provides water to the public if the State, or an agent approved by the State, performs a site visit before the end of the next month in which the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the State to determine whether additional monitoring and/or any corrective action is needed. The State cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the State to perform sanitary surveys.

(2) The State may waive the requirement to collect three routine samples the next month in which the system provides water to the public if the State has determined why the sample was total coliform-positive and has established that the system has corrected the problem or will correct the problem before the end of the next month in which the system serves water to the public. In this case, the State must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the State official who recommends such a decision, and make this document available to the EPA and public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem.

(3) The State may not waive the requirement to collect three additional routine samples the next month in which the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. If the State determines that the system has corrected the contamination problem before the system takes the set of repeat samples required in § 141.858, and all repeat samples were total coliform-negative, the State may waive the requirement for additional routine monitoring the next month.

§ 141.855 Routine monitoring requirements for community water systems serving 1,000 or fewer people using only ground water.

(a) *General.* (1) The provisions of this section apply to community water systems using only ground water (except ground water under the direct influence of surface water, as defined in § 141.2) and serving 1,000 or fewer people.

(2) Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in § 141.858.

(3) Once all monitoring required by this section and § 141.858 for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in § 141.859 have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by § 141.859.

(b) *Monitoring frequency for total coliforms.* The monitoring frequency for total coliforms is one sample/month, except as provided for under paragraphs (c) through (f) of this section.

(c) *Transition to subpart Y.* (1) All systems must continue to monitor according to the total coliform monitoring schedules under § 141.21 that were in effect on March 31, 2016, unless any of the conditions in paragraph (e) of this section are triggered on or after April 1, 2016, or unless otherwise directed by the State.

(2) Beginning April 1, 2016, the State must perform a special monitoring

evaluation during each sanitary survey to review the status of the system, including the distribution system, to determine whether the system is on an appropriate monitoring schedule. After the State has performed the special monitoring evaluation during each sanitary survey, the State may modify the system's monitoring schedule, as necessary, or it may allow the system to stay on its existing monitoring schedule, consistent with the provisions of this section. The State may not allow systems to begin less frequent monitoring under the special monitoring evaluation unless the system has already met the applicable criteria for less frequent monitoring in this section.

(d) *Criteria for reduced monitoring.* (1) The State may reduce the monitoring frequency from monthly monitoring to no less than quarterly monitoring if the system is in compliance with State-certified operator provisions and demonstrates that it meets the criteria in paragraphs (d)(1)(i) through (d)(1)(iii) of this section. A system that loses its certified operator must return to monthly monitoring the month following that loss.

(i) The system has a clean compliance history for a minimum of 12 months.

(ii) The most recent sanitary survey shows the system is free of sanitary defects (or has an approved plan and schedule to correct them and is in compliance with the plan and the schedule), has a protected water source and meets approved construction standards.

(iii) The system meets at least one of the following criteria:

(A) An annual site visit by the State that is equivalent to a Level 2 assessment or an annual Level 2 assessment by a party approved by the State and correction of all identified sanitary defects (or an approved plan and schedule to correct them and is in compliance with the plan and schedule).

(B) Cross connection control, as approved by the State.

(C) Continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the State.

(D) Demonstration of maintenance of at least a 4-log removal or inactivation of viruses as provided for under § 141.403(b)(3).

(E) Other equivalent enhancements to water system barriers as approved by the State.

(e) *Return to routine monthly monitoring requirements.* Systems on quarterly monitoring that experience any of the events in paragraphs (e)(1) through (e)(4) of this section must begin monthly monitoring the month following the event. The system must continue monthly monitoring until it meets the reduced monitoring requirements in paragraph (d) of this section.

(1) The system triggers a Level 2 assessment or two Level 1 assessments in a rolling 12-month period.

(2) The system has an *E. coli* MCL violation.

(3) The system has a coliform treatment technique violation.

(4) The system has two subpart Y monitoring violations in a rolling 12-month period.

(f) *Additional routine monitoring the month following a total coliform-positive sample.* Systems collecting samples on a quarterly frequency must conduct additional routine monitoring the month following one or more total coliform-positive samples (with or without a Level 1 treatment technique trigger). Systems must collect at least three routine samples during the next month, except that the State may waive this requirement if the conditions of paragraph (f)(1), (2), or (3) of this section are met. Systems may either collect samples at regular time intervals throughout the month or may collect all required routine samples on a single day if samples are taken from different sites. Systems must use the results of additional routine samples in coliform treatment technique trigger calculations.

(1) The State may waive the requirement to collect three routine samples the next month in which the system provides water to the public if the State, or an agent approved by the State, performs a site visit before the end of the next month in which the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the State to determine whether additional monitoring and/or any corrective action is needed. The State cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the State to perform sanitary surveys.

(2) The State may waive the requirement to collect three routine samples the next month in which the system provides water to the public if the State has determined why the sample was total coliform-positive and has established that the system has corrected the problem or will correct the problem before the end of the next month in which the system serves water to the public. In this case, the State must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the State official who recommends such a decision, and make this document available to the EPA and the public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem.

(3) The State may not waive the requirement to collect three additional routine samples the next month in which the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. If the State determines that the system has corrected the contamination problem before the system takes the set of repeat samples required in § 141.858, and all repeat samples were total coliform-negative, the State may waive the requirement for additional routine monitoring the next month.

§ 141.856 Routine monitoring requirements for subpart H public water systems serving 1,000 or fewer people.

(a) *General.* (1) The provisions of this section apply to subpart H public water systems of this part serving 1,000 or fewer people.

(2) Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in § 141.858.

(3) Once all monitoring required by this section and § 141.858 for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in § 141.859 have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by § 141.859.

(4) Seasonal systems. (i) Beginning April 1, 2016, all seasonal systems must demonstrate completion of a State-approved start-up procedure, which may include a requirement for start-up sampling prior to serving water to the public.

(ii) The State may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating.

(b) *Routine monitoring frequency for total coliforms.* Subpart H systems of this part (including consecutive systems) must monitor monthly. Systems may not reduce monitoring.

(c) *Unfiltered subpart H systems.* A subpart H system of this part that does not practice filtration in compliance with subparts H, P, T, and W must

collect at least one total coliform sample near the first service connection each day the turbidity level of the source water, measured as specified in § 141.74(b)(2), exceeds 1 NTU. When one or more turbidity measurements in any day exceed 1 NTU, the system must collect this coliform sample within 24 hours of the first exceedance, unless the State determines that the system, for logistical reasons outside the system's control, cannot have the sample analyzed within 30 hours of collection and identifies an alternative sample collection schedule. Sample results from this coliform monitoring must be included in determining whether the coliform treatment technique trigger in § 141.859 has been exceeded.

§ 141.857 Routine monitoring requirements for public water systems serving more than 1,000 people.

(a) *General.* (1) The provisions of this section apply to public water systems serving more than 1,000 persons.

(2) Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in § 141.858.

(3) Once all monitoring required by this section and § 141.858 for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in § 141.859 have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by § 141.859.

(4) Seasonal systems. (i) Beginning April 1, 2016, all seasonal systems must demonstrate completion of a State-approved start-up procedure, which may include a requirement for start-up sampling prior to serving water to the public.

(ii) The State may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating.

(b) *Monitoring frequency for total coliforms.* The monitoring frequency for total coliforms is based on the population served by the system, as follows:

TOTAL COLIFORM MONITORING FREQUENCY FOR PUBLIC WATER SYSTEMS SERVING MORE THAN 1,000 PEOPLE

Population served	Minimum number of samples per month
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480

(c) *Unfiltered subpart H systems.* A subpart H system of this part that does not practice filtration in compliance with subparts H, P, T, and W must collect at least one total coliform sample near the first service connection each day the turbidity level of the source water, measured as specified in § 141.74(b)(2), exceeds 1 NTU. When one or more turbidity measurements in any day exceed 1 NTU, the system must collect this coliform sample within 24 hours of the first exceedance, unless the State determines that the system, for logistical reasons outside the system's control, cannot have the sample analyzed within 30 hours of collection and identifies an alternative sample collection schedule. Sample results from this coliform monitoring must be included in determining whether the coliform treatment technique trigger in § 141.859 has been exceeded.

(d) *Reduced monitoring.* Systems may not reduce monitoring, except for non-community water systems using only ground water (and not ground water under the direct influence of surface water) serving 1,000 or fewer people in some months and more than 1,000 persons in other months. In months when more than 1,000 persons are served, the systems must monitor at the frequency specified in paragraph (a) of this section. In months when 1,000 or fewer people are served, the State may reduce the monitoring frequency, in writing, to a frequency allowed under § 141.854 for a similarly situated system that always serves 1,000 or fewer people, taking into account the provisions in § 141.854(e) through (g).

§ 141.858 Repeat monitoring and *E. coli* requirements.

(a) *Repeat monitoring.* (1) If a sample taken under §§ 141.854 though 141.857 is total coliform-positive, the system must collect a set of repeat samples within 24 hours of being notified of the positive result. The system must collect no fewer than three repeat samples for each total coliform-positive sample found. The State may extend the 24-hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. Alternatively, the State may implement criteria for the system to use in lieu of case-by-case extensions. In the case of an extension, the State must specify how much time the system has to collect the repeat samples. The State cannot waive the requirement for a system to collect repeat samples in paragraphs (a)(1) through (a)(3) of this section.

(2) The system must collect all repeat samples on the same day, except that the State may allow a system with a single service connection to collect the required set of repeat samples over a three-day period or to collect a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least 300 ml.

(3) The system must collect an additional set of repeat samples in the manner specified in paragraphs (a)(1) through (a)(3) of this section if one or more repeat samples in the current set of repeat samples is total coliform-positive. The system must collect the additional set of repeat samples within 24 hours of being notified of the positive result, unless the State extends the limit as provided in paragraph (a)(1) of this section. The system must continue to collect additional sets of repeat samples until either total coliforms are not detected in one complete set of repeat samples or the system determines that a coliform treatment technique trigger specified in § 141.859(a) has been exceeded as a result of a repeat sample being total coliform-positive and notifies the State. If a trigger identified

in § 141.859 is exceeded as a result of a routine sample being total coliform-positive, systems are required to conduct only one round of repeat monitoring for each total coliform-positive routine sample.

(4) After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(5) Results of all routine and repeat samples taken under §§ 141.854 through 141.858 not invalidated by the State must be used to determine whether a coliform treatment technique trigger specified in § 141.859 has been exceeded.

(b) *Escherichia coli (E. coli) testing.* (1) If any routine or repeat sample is total coliform-positive, the system must analyze that total coliform-positive culture medium to determine if *E. coli* are present. If *E. coli* are present, the system must notify the State by the end of the day when the system is notified of the test result, unless the system is notified of the result after the State office is closed and the State does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the State before the end of the next business day.

(2) The State has the discretion to allow a system, on a case-by-case basis, to forgo *E. coli* testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is *E. coli*-positive. Accordingly, the system must notify the State as specified in paragraph (b)(1) of this section and the provisions of § 141.63(c) apply.

§ 141.859 Coliform treatment technique triggers and assessment requirements for protection against potential fecal contamination.

(a) *Treatment technique triggers.* Systems must conduct assessments in accordance with paragraph (b) of this section after exceeding treatment technique triggers in paragraphs (a)(1) and (a)(2) of this section.

(1) Level 1 treatment technique triggers.

(i) For systems taking 40 or more samples per month, the system exceeds 5.0% total coliform-positive samples for the month.

(ii) For systems taking fewer than 40 samples per month, the system has two or more total coliform-positive samples in the same month.

(iii) The system fails to take every required repeat sample after any single total coliform-positive sample.

(2) Level 2 treatment technique triggers.

(i) An *E. coli* MCL violation, as specified in § 141.860(a).

(ii) A second Level 1 trigger as defined in paragraph (a)(1) of this section, within a rolling 12-month period, unless the State has determined a likely reason that the samples that caused the first Level 1 treatment technique trigger were total coliform-positive and has established that the system has corrected the problem.

(iii) For systems with approved annual monitoring, a Level 1 trigger in two consecutive years.

(b) *Requirements for assessments.* (1) Systems must ensure that Level 1 and 2 assessments are conducted in order to identify the possible presence of sanitary defects and defects in distribution system coliform monitoring practices. Level 2 assessments must be conducted by parties approved by the State.

(2) When conducting assessments, systems must ensure that the assessor evaluates minimum elements that include review and identification of inadequacies in sample sites; sampling protocol; sample processing; atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., small ground water systems); and existing water quality monitoring data. The system must conduct the assessment consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

(3) Level 1 Assessments. A system must conduct a Level 1 assessment consistent with State requirements if the system exceeds one of the treatment technique triggers in paragraph (a)(1) of this section.

(i) The system must complete a Level 1 assessment as soon as practical after any trigger in paragraph (a)(1) of this section. In the completed assessment form, the system must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified. The system must submit the completed Level 1 assessment form to the State within 30 days after the system learns that it has exceeded a trigger.

(ii) If the State reviews the completed Level 1 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the State must consult with the system. If the State requires revisions after consultation, the system must submit a revised assessment form to the State on an agreed-upon schedule not to exceed 30 days from the date of the consultation.

(iii) Upon completion and submission of the assessment form by the system, the State must determine if the system has identified a likely cause for the Level 1 trigger and, if so, establish that the system has corrected the problem, or has included a schedule acceptable to the State for correcting the problem.

(4) Level 2 Assessments. A system must ensure that a Level 2 assessment consistent with State requirements is conducted if the system exceeds one of the treatment technique triggers in paragraph (a)(2) of this section. The system must comply with any expedited actions or additional actions required by the State in the case of an *E. coli* MCL violation.

(i) The system must ensure that a Level 2 assessment is completed by the State or by a party approved by the State as soon as practical after any trigger in paragraph (a)(2) of this section. The system must submit a completed Level 2 assessment form to the State within 30 days after the system learns that it has exceeded a trigger. The assessment form must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified.

(ii) The system may conduct Level 2 assessments if the system has staff or management with the certification or qualifications specified by the State unless otherwise directed by the State.

(iii) If the State reviews the completed Level 2 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the State must consult with the system. If the State requires revisions after consultation, the system must submit a revised assessment form to the State on an agreed-upon schedule not to exceed 30 days.

(iv) Upon completion and submission of the assessment form by the system, the State must determine if the system

has identified a likely cause for the Level 2 trigger and determine whether the system has corrected the problem, or has included a schedule acceptable to the State for correcting the problem.

(c) *Corrective Action.* Systems must correct sanitary defects found through either Level 1 or 2 assessments conducted under paragraph (b) of this section. For corrections not completed by the time of submission of the assessment form, the system must complete the corrective action(s) in compliance with a timetable approved by the State in consultation with the system. The system must notify the State when each scheduled corrective action is completed.

(d) *Consultation.* At any time during the assessment or corrective action phase, either the water system or the State may request a consultation with the other party to determine the appropriate actions to be taken. The system may consult with the State on all relevant information that may impact on its ability to comply with a requirement of this subpart, including the method of accomplishment, an appropriate timeframe, and other relevant information.

§ 141.860 Violations.

(a) *E. coli MCL Violation.* A system is in violation of the MCL for *E. coli* when any of the conditions identified in paragraphs (a)(1) through (a)(4) of this section occur.

(1) The system has an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

(2) The system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

(3) The system fails to take all required repeat samples following an *E. coli*-positive routine sample.

(4) The system fails to test for *E. coli* when any repeat sample tests positive for total coliform.

(b) *Treatment technique violation.* (1) A treatment technique violation occurs when a system exceeds a treatment technique trigger specified in § 141.859(a) and then fails to conduct the required assessment or corrective actions within the timeframe specified in § 141.859(b) and (c).

(2) A treatment technique violation occurs when a seasonal system fails to complete a State-approved start-up procedure prior to serving water to the public.

(c) *Monitoring violations.* (1) Failure to take every required routine or additional routine sample in a compliance period is a monitoring violation.

(2) Failure to analyze for *E. coli* following a total coliform-positive routine sample is a monitoring violation.

(d) *Reporting violations.* (1) Failure to submit a monitoring report or completed assessment form after a system properly conducts monitoring or assessment in a timely manner is a reporting violation.

(2) Failure to notify the State following an *E. coli*-positive sample as required by § 141.858(b)(1) in a timely manner is a reporting violation.

(3) Failure to submit certification of completion of State-approved start-up procedure by a seasonal system is a reporting violation.

§ 141.861 Reporting and recordkeeping.

(a) *Reporting.* (1) *E. coli.*

(i) A system must notify the State by the end of the day when the system learns of an *E. coli* MCL violation, unless the system learns of the violation after the State office is closed and the State does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the State before the end of the next business day, and notify the public in accordance with subpart Q of this part.

(ii) A system must notify the State by the end of the day when the system is notified of an *E. coli*-positive routine sample, unless the system is notified of the result after the State office is closed and the State does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the State before the end of the next business day.

(2) A system that has violated the treatment technique for coliforms in § 141.859 must report the violation to the State no later than the end of the next business day after it learns of the violation, and notify the public in accordance with subpart Q of this part.

(3) A system required to conduct an assessment under the provisions of § 141.859 of this part must submit the assessment report within 30 days. The system must notify the State in accordance with § 141.859(c) when each scheduled corrective action is completed for corrections not completed by the time of submission of the assessment form.

(4) A system that has failed to comply with a coliform monitoring requirement must report the monitoring violation to the State within 10 days after the system discovers the violation, and notify the public in accordance with subpart Q of this part.

(5) A seasonal system must certify, prior to serving water to the public, that it has complied with the State-approved start-up procedure.

(b) *Recordkeeping.* (1) The system must maintain any assessment form, regardless of who conducts the assessment, and documentation of corrective actions completed as a result of those assessments, or other available summary documentation of the sanitary defects and corrective actions taken under § 141.858 for State review. This record must be maintained by the system for a period not less than five years after completion of the assessment or corrective action.

(2) The system must maintain a record of any repeat sample taken that meets State criteria for an extension of the 24-hour period for collecting repeat samples as provided for under § 141.858(a)(1) of this part.

PART 142—NATIONAL PRIMARY DRINKING WATER REGULATIONS IMPLEMENTATION

■ 21. The authority citation for part 142 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

■ 22. Section 142.14 is amended by revising paragraph (a)(1)(iii) and adding a new paragraph (a)(10) to read as follows:

§ 142.14 Records kept by States.

(a) * * *

(1) * * *

(iii) The analytical results, set forth in a form that makes possible comparison with the limits specified in §§ 141.63, 141.71, and 141.72 of this chapter and with the limits specified in subpart Y of this chapter.

* * * * *

(10) Records of each of the following decisions made pursuant to the provisions of subpart Y of part 141 must be made in writing and retained by the State.

(i) Records of the following decisions or activities must be retained for five years.

(A) Sections 141.858(a), 141.853(c)(2), 141.856(c), and 141.857(c) of this chapter—Any case-by-case decision to waive the 24-hour time limit for collecting repeat samples after a total coliform-positive routine sample, or to extend the 24-hour limit for collection of samples following invalidation, or for an unfiltered subpart H system of this part to collect a total coliform sample following a turbidity measurement exceeding 1 NTU.

(B) Sections 141.854(j) and 141.855(f) of this chapter—Any decision to allow a system to waive the requirement for

three routine samples the month following a total coliform-positive sample. The record of the waiver decision must contain all the items listed in those sections.

(C) Section 141.853(c) of this chapter—Any decision to invalidate a total coliform-positive sample. If the decision to invalidate a total coliform-positive sample as provided in § 141.853(c)(1) of this chapter is made, the record of the decision must contain all the items listed in that section.

(D) Section 141.859 of this chapter—Completed and approved subpart Y assessments, including reports from the system that corrective action has been completed as required by § 141.861(a)(2) of this chapter.

(ii) Records of each of the following decisions must be retained in such a manner so that each system's current status may be determined:

(A) Section 141.854(e) of this chapter—Any decision to reduce the total coliform monitoring frequency for a non-community water system using only ground water and serving 1,000 or fewer people to less than once per quarter, as provided in § 141.854(e) of this chapter, including what the reduced monitoring frequency is. A copy of the reduced monitoring frequency must be provided to the system.

(B) Section 141.855(d) of this chapter—Any decision to reduce the total coliform monitoring frequency for a community water system serving 1,000 or fewer people to less than once per month, as provided in § 141.855(d) of this chapter, including what the reduced monitoring frequency is. A copy of the reduced monitoring frequency must be provided to the system.

(C) Section 141.857(d) of this chapter—Any decision to reduce the total coliform monitoring frequency for a non-community water system using only ground water and serving more than 1,000 persons during any month the system serves 1,000 or fewer people, as provided in § 141.857(d) of this chapter. A copy of the reduced monitoring frequency must be provided to the system.

(D) Section 141.858(b)(2) of this chapter—Any decision to allow a system to forgo *E. coli* testing of a total coliform-positive sample if that system assumes that the total coliform-positive sample is *E. coli*-positive.

* * * * *

■ 23. Section 142.15 is amended by adding paragraph (c)(3) to read as follows:

§ 142.15 Reports by States.

* * * * *

(c) * * *

(3) *Total coliforms under subpart Y.* A list of systems that the State is allowing to monitor less frequently than once per month for community water systems or less frequently than once per quarter for non-community water systems as provided in §§ 141.855 and 141.854 of this chapter, including the applicable date of the reduced monitoring requirement for each system.

* * * * *

■ 24. Section 142.16 is amended by adding a new paragraph (q) to read as follows:

§ 142.16 Special primacy requirements.

* * * * *

(q) *Requirements for States to adopt 40 CFR part 141 subpart Y—Revised Total Coliform Rule.* In addition to the general primacy requirements elsewhere in this part, including the requirements that State regulations be at least as stringent as federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart Y, must contain the information specified in this paragraph (q).

(1) In their application to EPA for approval to implement the federal requirements, the primacy application must indicate what baseline and reduced monitoring provisions of 40 CFR part 141, subpart Y the State will adopt and must describe how they will implement 40 CFR part 141, subpart Y in these areas so that EPA can be assured that implementation plans meet the minimum requirements of the rule.

(2) The State's application for primacy for subpart Y must include a written description for each provision included in paragraphs (q)(2)(i) through (viii) of this section.

(i) Sample Siting Plans—The frequency and process used to review and revise sample siting plans in accordance with 40 CFR part 141, subpart Y to determine adequacy.

(ii) Reduced Monitoring Criteria—An indication of whether the State will adopt the reduced monitoring provisions of 40 CFR part 141, subpart Y. If the State adopts the reduced monitoring provisions, it must describe the specific types or categories of water systems that will be covered by reduced monitoring and whether the State will use all or a reduced set of the optional criteria. For each of the reduced monitoring criteria, both mandatory and optional, the State must describe how the criteria will be evaluated to determine when systems qualify.

(iii) Assessments and Corrective Actions—The process for implementing the new assessment and corrective action phase of the rule, including the elements in paragraphs (q)(2)(iii)(A) through (D) of this section.

(A) Elements of Level 1 and Level 2 assessments. This must include an explanation of how the State will ensure that Level 2 assessments provide a more detailed examination of the system (including the system's monitoring and operational practices) than do Level 1 assessments through the use of more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices.

(B) Examples of sanitary defects.

(C) Examples of assessment forms or formats.

(D) Methods that systems may use to consult with the State on appropriate corrective actions.

(iv) Invalidation of routine and repeat samples collected under 40 CFR part 141, subpart Y—The criteria and process for invalidating total coliform and *E. coli*-positive samples under 40 CFR part 141, subpart Y. This description must include criteria to determine if a sample was improperly processed by the laboratory, reflects a domestic or other non-distribution system plumbing problem or reflects circumstances or conditions that do not reflect water quality in the distribution system.

(v) Approval of individuals allowed to conduct Level 2 assessments under 40 CFR part 141, subpart Y—The criteria and process for approval of individuals allowed to conduct Level 2 assessments under 40 CFR part 141, subpart Y.

(vi) Special monitoring evaluation—The procedure for performing special monitoring evaluations during sanitary surveys for ground water systems serving 1,000 or fewer people to determine whether systems are on an appropriate monitoring schedule.

(vii) Seasonal systems—How the State will identify seasonal systems, how the State will determine when systems on less than monthly monitoring must monitor, and what start-up provisions seasonal system must meet under 40 CFR part 141, subpart Y.

(viii) Additional criteria for reduced monitoring—How the State will require systems on reduced monitoring to demonstrate:

(A) Continuous disinfection entering the distribution system and a residual in the distribution system.

(B) Cross connection control.

(C) Other enhancements to water system barriers.

(ix) Criteria for extending the 24-hour period for collecting repeat samples.—Under §§ 141.858(a) and 141.853(c)(2) of this chapter, criteria for systems to use in lieu of case-by-case decisions to waive the 24-hour time limit for collecting repeat samples after a total coliform-positive routine sample, or to extend the 24-hour limit for collection of samples following invalidation. If the State elects to use only case-by-case waivers, the State does not need to develop and submit criteria.

■ 25. Section 142.63 is amended by revising paragraph (b) to read as follows:

§ 142.63 Variances and exemptions from the maximum contaminant level for total coliforms.

* * * * *

(b) EPA has stayed this section as it relates to the total coliform MCL of § 141.63(a) of this chapter for systems that demonstrate to the State that the violation of the total coliform MCL is due to a persistent growth of total coliforms in the distribution system rather than fecal or pathogenic contamination, a treatment lapse or deficiency, or a problem in the operation or maintenance of the distribution system. This stay is applicable until March 31, 2016, at which time the total coliform MCL is no longer applicable.

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stock. Y stock is traded on an established securities market. Although the option is immediately exercisable, it has no readily ascertainable fair market value when it is granted. Under the option, Q has the right to purchase 100 shares of Y common stock for $10 per share, which is the fair market value of a Y share on the date of grant of the option. The grant of the option is not one that satisfies the requirements for a transaction that is exempt from section 16(b) of the Securities Exchange Act of 1934. On December 15, 2013, Y stock is trading at more than $10 per share. On that date, Q fully exercises the option, paying the exercise price in cash, and receives 100 Y shares. Q's rights in the shares received as a result of the exercise are not conditioned upon the future performance of substantial services. Because no exemption from section 16(b) was available for the June 3, 2013 grant of the option, the section 16(b) liability period expires on December 1, 2013. Accordingly, the section 16(b) liability period expires *before* the date that Q exercises the option and the Y common stock is transferred to Q. Thus, the shares acquired by Q pursuant to the exercise of the option are not subject to a substantial risk of forfeiture under section 83(c)(3) as a result of section 16(b). As a result, section 83(c)(3) does not preclude taxation under section 83 when the shares acquired pursuant to the December 15, 2013 exercise of the option are transferred to Q.

(ii) Assume the same facts as in paragraph (i) of this *Example 4* except that Q exercises the nonstatutory option on October 30, 2013 when Y stock is trading at more than $10 per share. The shares acquired are subject to a substantial risk of forfeiture under section 83(c)(3) as a result of section 16(b) through December 1, 2013.

(iii) Assume the same facts as in paragraph (i) of this *Example 4* except that on November 5, 2013, Q also purchases 100 shares of Y common stock on the public market. The purchase of the shares is not a transaction exempt from section 16(b) of the Securities Exchange Act of 1934. Because no exemption from section 16(b) was available for the November 5, 2013 purchase of shares, the section 16(b) liability period with respect to such shares will last for a period of six months after the November 5, 2013 purchase of shares. Notwithstanding the non-exempt purchase of Y common stock on November 5, 2013, the shares acquired by Q pursuant to the December 15, 2013 exercise of the option are not subject to a substantial risk of forfeiture under section 83(c)(3) as a result of section 16(b). As a result, section 83(c)(3) does not preclude taxation under section 83 when the shares acquired pursuant to the December 15, 2013 exercise of the option are transferred to Q.

* * * * *

(l) *Effective/applicability date.* This section applies to property transferred on or after January 1, 2013. For rules relating to property transferred before that date, see § 1.83–3 as contained in 26 CFR part 1 (as of April 1, 2012).

John Dalrymple,

Deputy Commissioner for Services and Enforcement.

Approved: January 31, 2014.

Mark J. Mazur,

Assistant Secretary of the Treasury (Tax Policy).

[FR Doc. 2014–03988 Filed 2–25–14; 8:45 am]

BILLING CODE 4830–01–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 141 and 142

[EPA–HQ–OW–2008–0878; FRL–9906–89–OW]

National Primary Drinking Water Regulations: Minor Corrections to the Revisions to the Total Coliform Rule

AGENCY: Environmental Protection Agency (EPA).

ACTION: Direct final rule.

SUMMARY: In this action, the Environmental Protection Agency (EPA) is making minor corrections to the final Revisions to the Total Coliform Rule (RTCR), as authorized under the Safe Drinking Water Act, to correct typographical errors in sections relating to recordkeeping and State primacy requirements, which could affect implementation and enforcement of the RTCR if they were left uncorrected. This action also includes other edits to the final rule language that are intended to improve the understanding of the rule and avoid confusion. This action does not impose new requirements; rather it clarifies what must be included in States' primacy applications related to this rule and the specific records water systems must keep.

DATES: This rule is effective on April 28, 2014 without further notice, unless EPA receives adverse comment by March 28, 2014. If EPA receives adverse comment, we will publish a timely withdrawal in the **Federal Register** informing the public that the rule will not take effect. The incorporation by reference of certain material listed in the rule was approved by the Director of the Federal Register as of April 15, 2013.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–OW–2008–0878, by one of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the on-line instructions for submitting comments.
- *Mail:* Water Docket, Environmental Protection Agency, Mailcode: 2822T, 1200 Pennsylvania Ave. NW., Washington, DC 20460, Attention Docket ID No. EPA–HQ–OW–2008–0878.
- *Hand Delivery:* EPA Docket Center, (EPA/DC) EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OW–2008–0878. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *www.regulations.gov* or email. The *www.regulations.gov* Web site is an ''anonymous access'' system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to EPA without going through *www.regulations.gov,* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at *http://www.epa.gov/epahome/dockets.htm.*

Docket: All documents in the docket are listed in the *www.regulations.gov* index. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy at the Water Docket, EPA Docket Center, (EPA/DC) EPA West, Room 3334, 1301

Constitution Ave. NW., Washington, DC. This Docket Facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The Docket telephone number is 202–566–2426.

FOR FURTHER INFORMATION CONTACT: Sean Conley, Standards and Risk Management Division, Office of Ground Water and Drinking Water (MC–4607M), Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460; telephone number: (202) 564–1781; email address: *conley.sean@epa.gov*. For general information, contact the Safe Drinking Water Hotline, telephone number: (800) 426–4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding legal holidays, from 10 a.m. to 4 p.m. Eastern time.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Why is EPA using a direct final rule?

EPA is publishing this direct final rule without a prior proposed rule because we view this as a noncontroversial action and anticipate no adverse comment; this action only corrects typographical errors and makes clarifying edits and does not impose new requirements. However, in the ''Proposed Rules'' section of today's **Federal Register**, we are publishing a separate document that will serve as the proposed rule to make the corrections and clarifying edits to the RTCR if adverse comments are received on this direct final rule. We will not institute a second comment period on this action. Any parties interested in commenting must do so at this time. Comments should be submitted only for the corrections being made in this direct final rule, not for other aspects of the final RTCR. For further information about commenting on this rule, see the **ADDRESSES** section of this document.

If EPA receives adverse comment, we will publish a timely withdrawal in the **Federal Register** informing the public that this direct final rule will not take effect. We would address all public comments in any subsequent final rule based on the proposed rule.

B. Regulated Categories and Entities

Entities potentially regulated by the RTCR as corrected are all public water systems (PWSs). Regulated categories and entities include the following:

Category	Examples of regulated entities
Industry	Privately-owned community water systems (CWSs), transient non-community water systems (TNCWSs), and non-transient non-community water systems (NTNCWSs).
Federal, State, Tribal, and local governments.	Publicly-owned CWSs, TNCWSs, and NTNCWSs.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities regulated by this action. This table lists the types of entities that EPA is now aware of that could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the definition of ''public water system'' in § 141.2 and the section entitled ''Coverage'' in § 141.3 in title 40 of the Code of Federal Regulations (CFR), and the applicability criteria in § 141.851(b) of the final RTCR. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

C. Copies of This Document and Other Related Information

This document is available for download at *http://water.epa.gov/lawsregs/rulesregs/sdwa/tcr/regulation_revisions.cfm*. For other related information, see preceding discussion on docket.

D. Minor Corrections to the Revisions to the Total Coliform Rule (RTCR)

A. Today's final rule corrects, as authorized under the Safe Drinking Water Act (SDWA), two typographical errors in the final RTCR (78 FR 10269, February 13, 2013) rule language. First, this action corrects a mistaken cross-reference regarding water system recordkeeping requirements for assessment forms and documentation of corrective actions and sanitary defects. EPA is correcting the cross-reference at § 141.861(b)(1) to correctly provide that assessments, corrective actions and identification of sanitary defects are required under the treatment technique requirements of § 141.859 of the final RTCR. The burden for these recordkeeping requirements was reflected in the Revised Total Coliform Rule (see Paperwork Reduction Act, section II.B of this notice) and in section 7 of the Economic Analysis (EA) for the Revised Total Coliform Rule (EPA–815–R–12–004). EPA also discussed these requirements in the preamble to the final RTCR on page 10295. Second, today's final rule also corrects the introductory paragraph at § 142.16(q)(2) to correctly indicate that the State's application for primacy must contain a written description of all provisions included in the subsections of the paragraph, (q)(2)(i) through (q)(2)(ix). It was always EPA's intent that primacy applications must contain a written description of all provisions in § 142.16(q)(2), but when EPA added subparagraph (q)(2)(ix) to the final rule, EPA neglected to change the numbering in the paragraph (2) lead-in to the list of elements. EPA intended this to be the case, as demonstrated in the preamble to the final RTCR on page 10301. In addition, the burden for this State activity was also included in section 7 of the EA for the RTCR. EPA is not developing a new EA for today's action because the EA for the final RTCR accounts for all costs associated with this rule.

Today's final rule also corrects the numbering in § 141.855(a) by adding subparagraph (d)(2) and reserving it, to most simply correct a numbering error that identified a subparagraph (d)(1) without a subsequent (d)(2). Correcting the numbering in this fashion will not interfere with any cross references to this subparagraph.

Today's rule also includes clarifying revisions to the language regarding primacy applications in § 142.16(q)(2)(ii) to make it more clear in the special primacy requirements section of the rule that systems must implement at least one of listed additional criteria to qualify for reduced monitoring. EPA clearly intended this to be the case, as reflected in § 141.854(h)(2) for NCWSs and § 141.855(d) for CWSs, and in the preamble to the final rule at page 10281 and 10282.

Next, the final rule clarifies the situations requiring public notification in Appendix A to Subpart Q of Part 141 to list out all of the possible reporting violations under the RTCR that will require Tier 3 public notice. EPA clearly intended this to be the case, as reflected in item (6) in Table 1 to § 141.204 (Violation Categories and Other Situations Requiring a Tier 3 Public

Notice), which provides that all reporting and recordkeeping violations under the RTCR require Tier 3 public notice. Also, page 10294 of the preamble to the final RTCR clearly states that Tier 3 PN is required for both monitoring and reporting violations under the RTCR.

Finally, the final rule clarifies the analytical methods table at § 141.852(a)(5) to place the citation ''Standard Methods Online 9223 B–97'' for the Colilert analytical method in the correct column.

These revisions do not change any rule requirements, are consistent with the rule requirements as intended by the Total Coliform Rule/Distribution System Advisory Committee that recommended the revisions to the Total Coliform Rule, and are intended only to clarify requirements and reduce confusion.

II. Statutory and Executive Order Review

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a ''significant regulatory action'' under the terms of Executive Order (EO) 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under the EO.

B. Paperwork Reduction Act

This action does not impose any new information collection burden. In this action, EPA is making minor corrections to the final RTCR to correct typographical errors in sections relating to recordkeeping and State primacy requirements and other edits to the final rule language that are intended to improve the understanding of the rule and avoid confusion. The Office of Management and Budget (OMB) has previously approved the information collection requirements contained in the existing regulations (40 CFR Parts 141 and 142) under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. and has assigned OMB control number 2040–0205. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

C. Regulatory Flexibility Act (RFA)

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

The RFA provides default definitions for each type of small entity. Small entities are defined as: (1) A small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any ''not-for-profit enterprise which is independently owned and operated and is not dominant in its field.'' However, the RFA also authorizes an agency to use alternative definitions for each category of small entity, ''which are appropriate to the activities of the agency'' after proposing the alternative definition(s) in the **Federal Register** and taking comment (5 U.S.C. 601(3)–(5)). In addition, to establish an alternative small business definition, agencies must consult with SBA's Chief Counsel for Advocacy.

For purposes of assessing the impacts of the RTCR on small entities, EPA considered small entities to be PWSs serving 10,000 or fewer people. This is the cut-off level specified by Congress in the 1996 Amendments to the Safe Drinking Water Act (SDWA) for small system flexibility provisions. As required by the RFA, EPA proposed using this alternative definition in the FR (63 FR 7620, February 13, 1998), requested public comment, consulted with the SBA, and finalized the alternative definition in the agency's Consumer Confidence Report regulation (63 FR 44524, August 19, 1998). As stated in that Final Rule, the alternative definition would be applied for all future drinking water regulations.

After considering the economic impacts of the minor corrections to the RTCR on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. The costs for recordkeeping and State primacy requirements were accounted for and detailed in the RTCR EA and summarized in the preamble of the final RTCR. A copy of the final RTCR and the RTCR EA can be found at *http://water.epa.gov/lawsregs/rulesregs/sdwa/tcr/regulation_revisions.cfm*.

D. Unfunded Mandates Reform Act (UMRA)

This rule does not contain a Federal mandate under the provisions of Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531–1538. This rule makes minor editorial corrections and clarifying edits to the final RTCR. Therefore, this rule is not subject to the requirements of sections 202 and 205 of UMRA.

This rule is also not subject to the requirements of section 203 of UMRA because it makes only minor corrections and clarifying edits that will not significantly or uniquely affect small governments.

E. Executive Order 13132: Federalism

This action does not have Federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government as specified in Executive Order 13132. Today's action makes minor corrections to the final RTCR to correct typographical errors in sections relating to recordkeeping and State primacy requirements and other edits to the final rule language that are intended to improve the understanding of the rule and avoid confusion. The recordkeeping and primacy requirements as corrected by today's action were included in the cost calculations that were described in the preamble to the final RTCR and used to determine that Executive Order 13132 does not apply to the final RTCR.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). This rule makes minor corrections to the final RTCR that will not have tribal implications. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

EPA interprets Executive Order 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the EO has the potential to influence the regulation. This action is not subject to EO 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This rule is not subject to Executive Order 13211 (66 FR 28355, May 22, 2001) because it is not a significant

regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, 12(d) (15 U.S.C. 272 note), directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when EPA decides not to use available and applicable voluntary consensus standards.

This final rule makes only minor corrections and edits that do not involve technical standards. Therefore, EPA is not considering the use of any voluntary consensus standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission. Agencies must do this by identifying and addressing, as appropriate, any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this action will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment. This rule makes minor corrections and edits to the final RTCR that will not have disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population.

K. Consultations With the Science Advisory Board, National Drinking Water Advisory Council, and the Secretary of Health and Human Services

In accordance with section 1412(d) and (e) of SDWA, EPA consulted with the Science Advisory Board (SAB), National Drinking Water Advisory Council (NDWAC), and the Secretary of the U.S. Department of Health and Human Services on the final RTCR. Because today's action is making only minor corrections to the final RTCR to correct typographical errors and other edits to the final rule language that are intended to improve the understanding of the rule and avoid confusion, EPA did not consult with the SAB, NDWAC or the Secretary on today's action.

L. Considerations of Impacts on Sensitive Subpopulations as Required by Section 1412(b)(3)(C)(i)(V) of the 1996 Amendments of SDWA

As required by Section 1412(b)(3)(C)(i)(V) of SDWA, EPA sought public comment regarding the effects of contamination associated with the proposed RTCR on the general population and sensitive subpopulations. Sensitive subpopulations include ''infants, children, pregnant women, the elderly, individuals with a history of serious illness, or other subpopulations that are identified as likely to be at greater risk of adverse health effects due to exposure to contaminants in drinking water than the general population'' (SDWA section 1412(b)(3)(C)(i)(V), 42 U.S.C. 300g–1(b)(3)(C)(i)(V)). As indicated in the preamble to the final RTCR, EPA anticipates that the requirements of the final RTCR will help reduce pathways of entry for fecal contamination and/or waterborne pathogens into the distribution system, thereby reducing exposure and risk from these contaminants in drinking water to the entire general population.

Today's final rule is making only minor corrections to the final RTCR to correct typographical errors and other edits to the final rule language that are intended to improve the understanding of RTCR and avoid confusion and does not alter the conclusion that the final RTCR seeks to provide a similar level of drinking water protection to all groups including sensitive subpopulations.

M. Effect of Compliance With the Minor Corrections to the RTCR on the Technical, Financial, and Managerial Capacity of Public Water Systems

Section 1420(d)(3) of SDWA, as amended, requires that, in promulgating an NPDWR, the Administrator shall include an analysis of the likely effect of compliance with the regulation on the technical, managerial and financial (TMF) capacity of PWSs. EPA completed an analysis of the impact of complying with the requirements of the RTCR on the TMF capacity of PWSs and a detailed discussion of EPA's analysis was presented in chapter 8.14 of the RTCR EA. The PWS recordkeeping requirements as corrected by today's rule were included in the analysis of the TMF capacity for the final RTCR and therefore no changes to that analysis are needed to accompany this action.

N. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States (U.S.). EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the U.S. prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will be effective April 28, 2014.

List of Subjects

40 CFR Part 141

Environmental protection, Chemicals, Incorporation by reference, Indian-lands, Intergovernmental relations, Radiation protection, Reporting and recordkeeping requirements, Water supply.

40 CFR Part 142

Environmental protection, Administrative practice and procedure, Chemicals, Indian-lands, Radiation protection, Reporting and recordkeeping requirements, Water supply.

Dated: February 10, 2014.

Gina McCarthy,

Administrator.

For the reasons set forth in the preamble, Title 40 chapter 1 of the Code of Federal Regulations is amended as follows:

PART 141—NATIONAL PRIMARY DRINKING WATER REGULATIONS

■ 1. The authority citation for part 141 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

■ 2. Appendix A to Subpart Q of Part 141 is amended by revising entries I.A.1 and I.A.2 to read as follows:

Appendix A to Subpart Q of Part 141—NPDWR Violations and Other Situations Requiring Public Notice [1]

Contaminant	MCL/MRDL/TT violations [2]		Monitoring, testing & reporting procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
I. Violations of National Primary Drinking Water Regulations (NPDWR): [3]				
A. Microbiological Contaminants				
1.a Total coliform bacteria †	2	141.63(a)	3	141.21(a)–(e).
1.b Total coliform (TT violations resulting from failure to perform assessments or corrective actions, monitoring violations, and reporting violations) ‡.	2	141.860(b)(1)	3	141.860(c)(1).
				141.860(d)(1).
1.c Seasonal system failure to follow State-approved start-up plan prior to serving water to the public or failure to provide certification to State ‡.	2	141.860(b)(2)	3	141.860(d)(3).
2.a Fecal coliform/*E. coli* †	1	141.63(b)	[4] 1,3	141.21(e)
2.b *E. coli* (MCL, monitoring, and reporting violations) ‡	1	141.860 (a)	3	141.860(c)(2)
				141.860(d)(1).
				141.860(d)(2).
2.c *E. coli* (TT violations resulting from failure to perform level 2 Assessments or corrective action) ‡.	2	141.860(b)(1)		
* * * *	*		*	*

Appendix A—Endnotes

† Until March 31, 2016.

‡ Beginning April 1, 2016.

1. Violations and other situations not listed in this table (e.g., failure to prepare Consumer Confidence Reports), do not require notice, unless otherwise determined by the primacy agency. Primacy agencies may, at their option, also require a more stringent public notice tier (e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Appendix, as authorized under §§ 141.202(a) and 141.203(a).

2. MCL—Maximum contaminant level, MRDL—Maximum residual disinfectant level, TT—Treatment technique.

3. The term Violations of National Primary Drinking Water Regulations (NPDWR) is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.

4. Failure to test for fecal coliform or E. coli is a Tier 1 violation if testing is not done after any repeat sample tests positive for coliform. All other total coliform monitoring and testing procedure violations are Tier 3.

* * * * *

■ 3. Section 141.852 is amended by revising the entry for ''Total Coliforms'' in the table in paragraph (a)(5) to read as follows:

§ 141.852 Analytical methods and laboratory certification.

(a) * * *

(5) * * *

Organism	Methodology category	Method [1]	Citation [1]
Total coliforms	Lactose Fermentation Methods.	Standard Total Coliform Fermentation Technique	Standard Methods 9221 B.1, B.2 (20th ed.; 21st ed.).[2 3]
			Standard Methods Online 9221 B.1, B.2–99.[2 3]
		Presence-Absence (P–A) Coliform Test	Standard Methods 9221 D.1, D.2 (20th ed.; 21st ed.).[2 7]
			Standard Methods Online 9221 D.1, D.2–99.[2 7]
	Membrane Filtration Methods.	Standard Total Coliform Membrane Filter Procedure.	Standard Methods 9222 B, C (20th ed.; 21st ed.).[2 4]
			Standard Methods Online 9222 B–97[2 4], 9222 C–97.[2 4]
		Membrane Filtration using MI medium	EPA Method 1604.[2]
		m-ColiBlue24® Test [2 4]	
		Chromocult [2 4]	
	Enzyme Substrate Methods.	Colilert®	Standard Methods 9223 B (20th ed.; 21st ed.).[2 5]
			Standard Methods Online 9223 B–97.[2 5]
		Colisure®	Standard Methods 9223 B (20th ed.; 21st ed.).[2 5 6]
			Standard Methods Online 9223 B–97.[2 5 6]

Organism	Methodology category	Method [1]	Citation [1]
Total coliforms			
	.....	E*Colite® Test [2]	
	.....	Readycult® Test [2]	
	.....	modified Colitag® Test [2]	
* * * * * * *			

[1] The procedures must be done in accordance with the documents listed in paragraph (c) of this section. For Standard Methods, either editions, 20th (1998) or 21st (2005), may be used. For the Standard Methods Online, the year in which each method was approved by the Standard Methods Committee is designated by the last two digits following the hyphen in the method number. The methods listed are the only online versions that may be used. For vendor methods, the date of the method listed in paragraph (c) of this section is the date/version of the approved method. The methods listed are the only versions that may be used for compliance with this rule. Laboratories should be careful to use only the approved versions of the methods, as product package inserts may not be the same as the approved versions of the methods.

[2] Incorporated by reference. See paragraph (c) of this section.

[3] Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the water normally tested, and if the findings from this comparison demonstrate that the false-positive rate and false-negative rate for total coliforms, using lactose broth, is less than 10 percent.

[4] All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving. Exposure of filtration equipment to UV light is not adequate to ensure sterilization. Subsequent to the initial autoclaving, exposure of the filtration equipment to UV light may be used to sanitize the funnels between filtrations within a filtration series. Alternatively, membrane filtration equipment that is pre-sterilized by the manufacturer (i.e., disposable funnel units) may be used.

[5] Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.

[6] Colisure® results may be read after an incubation time of 24 hours.

[7] A multiple tube enumerative format, as described in *Standard Methods for the Examination of Water and Wastewater* 9221, is approved for this method for use in presence-absence determination under this regulation.

* * * * *

§ 141.855 [Amended]

■ 4. Section 141.855 is amended by adding a reserved paragraph (d)(2).

§ 141.861 [Amended]

■ 5. In § 141.861, paragraph (b)(1) is amended by removing ''§ 141.858'' and adding in its place ''§ 141.859''.

PART 142—NATIONAL PRIMARY DRINKING WATER REGULATIONS

■ 6. The authority citation for part 142 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

■ 7. Section 142.16 is amended by revising paragraphs (q)(2) introductory text and (q)(2)(ii) to read as follows:

§ 142.16 Special primacy requirements.

* * * * *

(q) * * *

(2) The State's application for primacy for subpart Y must include a written description for each provision included in paragraphs (q)(2)(i) through (ix) of this section.

* * * * *

(ii) Reduced Monitoring Criteria—An indication of whether the State will adopt the reduced monitoring provisions of 40 CFR part 141, subpart Y. If the State adopts the reduced monitoring provisions, it must describe the specific types or categories of water systems that will be covered by reduced monitoring and whether the State will use all or a reduced set of the criteria specified in §§ 141.854(h)(2) and 141.855(d)(1)(iii) of this chapter. For each of the reduced monitoring criteria, the State must describe how the criterion will be evaluated to determine when systems qualify.

* * * * *

[FR Doc. 2014–04173 Filed 2–25–14; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 180

[EPA–HQ–OPP–2012–0638; FRL–9906–70]

Fluxapyroxad; Pesticide Tolerances

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This regulation establishes tolerances for residues of fluxapyroxad in or on multiple commodities which are identified and discussed later in this document. BASF Corporation requested these tolerances under the Federal Food, Drug, and Cosmetic Act (FFDCA).

DATES: This regulation is effective February 26, 2014. Objections and requests for hearings must be received on or before April 28, 2014, and must be filed in accordance with the instructions provided in 40 CFR part 178 (see also Unit I.C. of the **SUPPLEMENTARY INFORMATION**).

ADDRESSES: The docket for this action, identified by docket identification (ID) number EPA–HQ–OPP–2012–0638, is available at *http://www.regulations.gov* or at the Office of Pesticide Programs Regulatory Public Docket (OPP Docket) in the Environmental Protection Agency Docket Center (EPA/DC), EPA West Bldg., Rm. 3334, 1301 Constitution Ave. NW., Washington, DC 20460–0001. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the OPP Docket is (703) 305–5805. Please review the visitor instructions and additional information about the docket available at *http://www.epa.gov/dockets*.

FOR FURTHER INFORMATION CONTACT: Lois Rossi, Registration Division (7505P), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460–0001; telephone number: [(703) 305–7090; email address: *RDFRNotices@epa.gov*.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this action apply to me?

You may be potentially affected by this action if you are an agricultural producer, food manufacturer, or pesticide manufacturer. The following list of North American Industrial Classification System (NAICS) codes is not intended to be exhaustive, but rather

This table is not intended to be exhaustive but to provide a guide for readers regarding entities likely to be affected by this NODA. To determine whether this NODA affects your facility, company, business, organization, etc., you should examine the applicability criteria in 40 CFR 60.1. If you have questions regarding applicability, consult either the air permitting authority for the entity in question or your EPA regional representative as listed in 40 CFR 60.4 or 40 CFR 63.13 (General Provisions).

II. What are the background and purpose of this NODA?

On January 8, 2014, the EPA published the proposed rule, ''Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units,'' (79 FR 1430) which was issued pursuant to Clean Air Act (CAA) section 111. In the proposed rule, the EPA explains its rationale for emission standards for new fossil fuel-fired boiler and integrated gasification combined cycle (IGCC) electric utility generating units (EGUs). These standards are based on the determination that the best system of emission reduction (BSER) for those sources is partial carbon capture and sequestration (CCS). The EPA today is providing a technical support document (TSD) that addresses the interaction of the determination of BSER in the proposed rule and several provisions in the Energy Policy Act of 2005 (EPAct05), which are described immediately below.

Limitations associated with EPAct05. In providing assistance to fossil fuel-fired electricity generating plants and other facilities that employ advanced technology, EPAct05 included several provisions that limit the EPA's authority to rely on information from those facilities in conducting rulemaking or taking other action under various provisions of the CAA, including section 111. Section 402(i) of the EPAct05, codified at 42 U.S.C. section 15962(i), provides as follows, insofar as is presently relevant, that no technology, or level of emission reduction, *solely* by reason of the use of the technology, or the achievement of the emission reduction, by one or more facilities receiving assistance under EPAct05, shall be considered to be adequately demonstrated for purposes of section 111 of the Clean Air Act.[1]

In addition, internal revenue code (IRC) section 48A(g), codified at 26 USC section 48A(g), provides, insofar as is presently relevant, that no use of technology (or level of emission reduction solely by reason of the use of the technology), and no achievement of any emission reduction by the demonstration of any technology or performance level, by or at one or more facilities with respect to which a credit is allowed under this section, shall be considered to indicate that the technology or performance level is adequately demonstrated for purposes of section 111 of the Clean Air Act.

As explained in the TSD, the EPA's preliminary interpretation of these provisions is that EPA may not rely on information from facilities that have received assistance under EPAct05, including being allowed tax credits under IRC section 48A, as the sole basis for a determination that a particular technology is the best system of emission reduction adequately demonstrated (BSER), but the EPA may rely on information from those facilities in conjunction from other information to support such a determination, or to corroborate an otherwise supported determination. In the TSD, the EPA also explains and solicits comments on other issues of interpretation that arise from the terms of IRC section 48A(g).

2014 Proposal BSER and EPAct05. In the proposed rule, the EPA determined that implementation of partial capture CCS technology is the BSER for new fossil fuel-fired boilers and IGCC units because it fulfills the criteria established under CAA section 111. The EPA's rationale, insofar as is relevant for present purposes, is that partial capture is technically feasible and can be implemented at a reasonable cost. In discussing its rationale, the EPA referenced some facilities that have received financial assistance under the EPAct05, including being allocated tax credits pursuant to IRC section 48A. As explained in the TSD, however, the EPA's rationale does not depend solely upon those projects, and the determination remains adequately supported without any information from facilities that have been allocated the IRC section 48A tax credit.

Thus, the EPA's proposed standards, which are based on its determination that partial capture CCS represents the best system of emission reduction adequately demonstrated, are not beyond the scope of its legal authority. As indicated in the TSD, the EPA solicits comment on all aspects of the interpretation of the provisions in EPAct05, including IRC section 48A(g), that limit the EPA's authority to rely on certain information in rulemaking under CAA section 111.

List of Subjects

40 CFR Part 60

Environmental protection, Administrative practice and procedure, Air pollution control, Intergovernmental relations, Reporting and recordkeeping requirements.

40 CFR Part 70

Environmental protection, Administrative practice and procedure, Air pollution control, Intergovernmental relations, Reporting and recordkeeping requirements.

40 CFR Part 71

Environmental protection, Administrative practice and procedure, Air pollution control, Reporting and recordkeeping requirements.

40 CFR Part 98

Environmental protection, Greenhouse gases and monitoring, Reporting and recordkeeping requirements.

Dated: February 5, 2014.

Mary E. Henigin,

Acting Director, Office of Air Quality Planning and Standards.

[FR Doc. 2014–03115 Filed 2–25–14; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 141 and 142

[EPA–HQ–OW–2008–0878; FRL–9906–88–OW]

National Primary Drinking Water Regulations: Minor Corrections to the Revisions to the Total Coliform Rule

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: In this action, the Environmental Protection Agency (EPA) is proposing minor corrections to the final Revisions to the Total Coliform

[1] In addition, EPAct05 Title IV amended the Energy Policy Act of 1992 (42 U.S.C. 13201 et seq.) (EPAct92) by adding the ''Clean Air Coal Program'' to support and promote the production and generation of clean coal-based power, including supporting air pollution control technologies. These provisions included, in EPAct05 § 421(a), a constraint similar to EPAct05 § 402(i). As amended by EPAct05 § 421(a), EPAct92 § 3103(e) (42 U.S.C. 13573(e)) and EPAct92 § 3104(d) (42 U.S.C. 13574(d)), provides, insofar as is presently relevant, under the heading, ''Applicability,'' that no technology, or level of emission reduction, shall be treated as adequately demonstrated for purpose of section 111 of the Clean Air Act solely by reason of the use of such technology, or the achievement of such emission reduction, by one or more facilities receiving assistance under section 3102(a)(1) or (2) of the Energy Policy Act of 1992, as amended (42 U.S.C. 13572(a)(1)).

Rule (RTCR), as authorized under the Safe Drinking Water Act, to correct typographical errors in sections relating to recordkeeping and State primacy requirements, which could affect implementation and enforcement of the RTCR if they were left uncorrected. This proposed action also includes other edits to the final rule language that are intended to improve the understanding of the rule and avoid confusion. This proposed action does not impose new requirements; rather it clarifies what must be included in States' primacy applications related to this rule and the specific records water systems must keep. In the ''Rules and Regulations'' section of this **Federal Register**, EPA is making these minor corrections and edits to the final RTCR as a direct final rule without a prior proposed rule. If we receive no adverse comment, we will not take further action on this proposed rule.

DATES: Written comments must be received by March 28, 2014.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–OW–2008–0878, by mail to Water Docket, Environmental Protection Agency, Mailcode: 2822T, 1200 Pennsylvania Ave. NW., Washington, DC 20460. Comments may also be submitted electronically or through hand delivery/courier by following the detailed instructions in the **ADDRESSES** section of the direct final rule located in the rules section of this **Federal Register**.

FOR FURTHER INFORMATION CONTACT: Sean Conley, Standards and Risk Management Division, Office of Ground Water and Drinking Water (MC–4607M), Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460; telephone number: (202) 564–1781; email address: *conley.sean@epa.gov*. For general information, contact the Safe Drinking Water Hotline, telephone number: (800) 426–4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding legal holidays, from 10 a.m. to 4 p.m. Eastern time.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Why is EPA issuing this proposed rule?

EPA is proposing minor corrections to the final Revisions to the Total Coliform Rule (RTCR) to correct typographical errors in sections relating to recordkeeping and State primacy requirements, which could affect implementation and enforcement of the RTCR if left uncorrected. This proposed action also includes other edits to the final rule language that are intended to improve the understanding of the rule and avoid confusion. This proposed action does not impose new requirements; rather it clarifies what must be included in States' primacy applications related to this rule and the specific records water systems must keep.

II. Regulated Categories and Entities

Entities potentially regulated by the proposed corrections to the final RTCR are all public water systems (PWSs). Regulated categories and entities include the following:

Category	Examples of regulated entities
Industry	Privately-owned community water systems (CWSs), transient non-community water systems (TNCWSs), and non-transient non-community water systems (NTNCWSs).
Federal, State, Tribal, and local governments.	Publicly-owned CWSs, TNCWSs, and NTNCWSs.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities regulated by this action. This table lists the types of entities that EPA is now aware of that could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the definition of ''public water system'' in § 141.2 and the section entitled ''Coverage'' in § 141.3 in title 40 of the Code of Federal Regulations (CFR), and the applicability criteria in § 141.851(b) of the final RTCR. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

C. Copies of This Document and Other Related Information

This document is available for download at *http://water.epa.gov/lawsregs/rulesregs/sdwa/tcr/regulation_revisions.cfm.* For other related information, see the docket section of the direct final rule located in the rules section of this **Federal Register**.

D. Minor Corrections to the Revisions to the Total Coliform Rule (RTCR)

Today's proposed rule corrects, as authorized under the Safe Drinking Water Act (SDWA), two typographical errors in the final RTCR (78 FR 10269, February 13, 2013) rule language. First, this proposed action corrects a mistaken cross-reference regarding water system recordkeeping requirements for assessment forms and documentation of corrective actions and sanitary defects. EPA is correcting the cross-reference at § 141.861(b)(1) to correctly provide that assessments, corrective actions and identification of sanitary defects are required under the treatment technique requirements of section 141.859 of the final RTCR. The burden for these recordkeeping requirements was reflected in the Revised Total Coliform Rule and in section 7 of the Economic Analysis (EA) for the Revised Total Coliform Rule (EPA–815–R–12–004).

EPA also discussed these requirements in the preamble to the final RTCR on page 10295. Second, today's proposed rule also corrects the introductory paragraph at § 142.16(q)(2) to correctly indicate that the State's application for primacy must contain a written description of all provisions included in the subsections of the paragraph, (q)(2)(i) through (q)(2)(ix). It was always EPA's intent that primacy applications must contain a written description of all provisions in 142.16(q)(2), but when EPA added subparagraph (q)(2)(ix) to the final rule, EPA neglected to change the numbering in the paragraph (2) lead-in to the list of elements. EPA intended this to be the case, as demonstrated in the preamble to the final RTCR on page 10301. In addition, the burden for this State activity was also included in section 7 of the Economic Analysis (EA) for the RTCR. EPA is not developing a new EA for today's action because the EA for the final RTCR accounts for all costs associated with this rule.

Today's proposed rule also corrects the numbering in § 141.855(a) by adding subparagraph (d)(2) and reserving it, to most simply correct a numbering error that identified a subparagraph (d)(1) without a subsequent (d)(2). Correcting the numbering in this fashion will not interfere with any cross references to subparagraph (d)(1).

Today's proposed rule also includes clarifying revisions to the language regarding primacy applications in § 142.16(q)(2)(ii) to make it more clear in the special primacy requirements section of the RTCR that systems must implement at least one of listed additional criteria to qualify for reduced monitoring. EPA clearly intended this to be the case, as reflected in § 141.854(h)(2) for NCWSs and § 141.855(d) for CWSs, and in the preamble to the final RTCR at pages 10281 and 10282.

Next, the final rule clarifies situations requiring public notification in Appendix A to Subpart Q of Part 141 to list out all of the possible reporting violations under the RTCR that will require Tier 3 public notice. EPA clearly intended this to be the case, as reflected in item (6) in Table 1 to § 141.204 (Violation Categories and Other Situations Requiring a Tier 3 Public Notice), which provides that all reporting and recordkeeping violations under the RTCR require Tier 3 public notice. Also, page 10294 of the preamble to the final RTCR clearly states that Tier 3 PN is required for both monitoring and reporting violations under the RTCR.

Finally, the final rule clarifies the analytical methods table in § 141.852(a)(5) to place the citation ''Standard Methods Online 9223 B–97'' for the Colilert analytical method in the correct column.

These revisions do not change any rule requirements, are consistent with the rule requirements as intended by the Total Coliform Rule/Distribution System Advisory Committee that recommended the revisions to the Total Coliform Rule, and are intended only to clarify requirements and reduce confusion.

II. Additional Supplementary Information

We are publishing a Direct Final Rule to this parallel proposal in the final rule section of today's **Federal Register**. Additional supplementary information is available in the Direct Final Rule, ''National Primary Drinking Water Regulation: Minor Corrections to the Revisions to the Total Coliform Rule.''

Dated: February 10, 2014.

Gina McCarthy,

Administrator.

[FR Doc. 2014–04171 Filed 2–25–14; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Medicare & Medicaid Services

42 CFR Part 414

[CMS–1460–ANPRM]

RIN 0938–AS05

Medicare Program; Methodology for Adjusting Payment Amounts for Certain Durable Medical Equipment, Prosthetics, Orthotics, and Supplies (DMEPOS) Using Information From Competitive Bidding Programs

AGENCY: Centers for Medicare & Medicaid Services (CMS), HHS.

ACTION: Advance notice of proposed rulemaking (ANPRM).

SUMMARY: This advance notice of proposed rulemaking (ANPRM) solicits public comments on different methodologies we may consider using with regard to applying information from the durable medical equipment, prosthetics, orthotics, and supplies (DMEPOS) competitive bidding programs to adjust Medicare fee schedule payment amounts or other Medicare payment amounts for DMEPOS items and services furnished in areas that are not included in these competitive bidding programs. In addition, we are also requesting comments on a different matter regarding ideas for potentially changing the payment methodologies used under the competitive bidding programs for certain durable medical equipment and enteral nutrition.

DATES: To be assured consideration, comments must be received at one of the addresses provided below, no later than 5 p.m. on March 28, 2014.

Customer Service Information: Individuals interested in obtaining information from the Centers for Medicare & Medicaid Services concerning current Medicare payment policies may call 1–800–MEDICARE (633–4227) or visit the Centers for Medicare & Medicaid Web site (*http://www.cms.gov*) or (*http://www.medicare.gov*).

ADDRESSES: In commenting, please refer to file code CMS–1460–ANPRM. Because of staff and resource limitations, we cannot accept comments by facsimile (FAX) transmission.

You may submit comments in one of four ways (please choose only one of the ways listed):

1. *Electronically.* You may submit electronic comments on this regulation to http://www.regulations.gov. Follow the ''Submit a comment'' instructions.

2. *By regular mail.* You may mail written comments to the following address ONLY: Centers for Medicare & Medicaid Services, Department of Health and Human Services, Attention: CMS–1460–ANPRM, P.O. Box 8010, Baltimore, MD 21244–8010.

Please allow sufficient time for mailed comments to be received before the close of the comment period.

3. *By express or overnight mail.* You may send written comments to the following address ONLY: Centers for Medicare & Medicaid Services, Department of Health and Human Services, Attention: CMS–1460–ANPRM, Mail Stop C4–26–05, 7500 Security Boulevard, Baltimore, MD 21244–1850.

4. *By hand or courier.* Alternatively, you may deliver (by hand or courier) your written comments ONLY to the following addresses prior to the close of the comment period:

a. For delivery in Washington, DC—Centers for Medicare & Medicaid Services, Department of Health and Human Services, Room 445–G, Hubert H. Humphrey Building, 200 Independence Avenue SW., Washington, DC 20201

(Because access to the interior of the Hubert H. Humphrey Building is not readily available to persons without Federal government identification, commenters are encouraged to leave their comments in the CMS drop slots located in the main lobby of the building. A stamp-in clock is available for persons wishing to retain a proof of filing by stamping in and retaining an extra copy of the comments being filed.)

b. For delivery in Baltimore, MD—Centers for Medicare & Medicaid Services, Department of Health and Human Services, 7500 Security Boulevard, Baltimore, MD 21244–1850.

If you intend to deliver your comments to the Baltimore address, call telephone number (410) 786–9994 in advance to schedule your arrival with one of our staff members.

Comments erroneously mailed to the addresses indicated as appropriate for hand or courier delivery may be delayed and received after the comment period.

For information on viewing public comments, see the beginning of the **SUPPLEMENTARY INFORMATION** section.

FOR FURTHER INFORMATION CONTACT: Anita Greenberg, (410) 786–4601. Karen Jacobs, (410) 786–2173. Christopher Molling, (410) 786–6399. Hafsa Vahora, (410) 786–7899.

SUPPLEMENTARY INFORMATION: *Inspection of Public Comments:* All comments

The Texas Commission on Environmental Quality (TCEQ, agency, or commission) proposes to amend §§290.38, 290.42, 290.46, 290.47, 290.102 - 290.104, 290.106 - 290.119, 290.121, 290.122, 290.272, and 290.275.

Background and Summary of the Factual Basis for the Proposed Rules

Under 40 Code of Federal Regulations (CFR) §142.10 and §142.12, TCEQ shall adopt rules at least as stringent as the federal rules to maintain primacy over the Public Water System Supervision Program in Texas. The Revised Total Coliform Rule (RTCR), a federal drinking water rule, was promulgated by the United States Environmental Protection Agency (EPA) on February 13, 2013. The RTCR increases public health protection through the reduction of potential pathways of entry for fecal contamination into the distribution system of public water systems. Greater public health protection is anticipated under the RTCR as it requires public water systems that are vulnerable to microbial contamination to identify and address problems.

The proposed amendments to Chapter 290, provide rule language that is no less stringent than the RTCR. The proposed amendments provide for consistency with other federal drinking water provisions, address the EPA's comments on the federal Ground Water Rule (GWR), and provide clarification on existing state rules. Regarding the GWR, the EPA conducted a primacy review of the TCEQ's adopted GWR rules. On March 10, 2014, the EPA provided its GWR comments outlining additional state rule revisions needed. TCEQ proposes to amend Chapter 290 to ensure that the state rules are no less stringent than with the federal GWR in response to the EPA's primacy review comments.

The RTCR's implementation date for public water systems is April 1, 2016. Due to an open section conflict with an ongoing rulemaking, the Office of Water requested an extension from the EPA on this rule's implementation and the request was approved by EPA on March 4, 2015. States with an approved extension shall submit complete and final program revision packages to the EPA by February 13, 2017.

Section by Section Discussion

In addition to the proposed revisions associated with this rulemaking, the proposed rulemaking also includes various stylistic, non-substantive changes to update rule language to current *Texas Register* style and format requirements. Such changes included appropriate and consistent use of acronyms, section references, rule structure, and certain terminology. Where the proposal of new subsections, paragraphs, subparagraphs, etc. are proposed, subsequent relettering or renumbering are modified accordingly. These changes are non-substantive and generally not specifically discussed in this preamble.

The terms "system" and "water system" were amended to "public water system" where appropriate and will not be specifically discussed in each section.

§290.38, Definitions

The commission proposes to add §290.38(31) and (32), defining "Grantee" and "Grantor," to clarify the proposed amendment of §290.46(p)(1). Subsequent definitions are renumbered accordingly due to the addition of "Grantee" and "Grantor." Under the

current §290.46(p)(1), notice of the change of ownership is required before the change in owner actually occurs, so the terms of "prospective owner" and "current owner" are unambiguous. Under the proposed §290.46(p)(1), notice of the change of ownership is required no later than 30 days after the change in ownership occurs, which will occur at an indefinite point in time. For purposes of enforcement and clarity, the terms "grantee" and "grantor" are substituted for "prospective owner" and "current owner" in proposed §290.46(p)(1).

The commission proposes to add §290.38(82) to clarify that the use of the word "System" has the same meaning as "Public water system," as described in §290.38(71). The commission proposes a similar addition with §290.38(88) to clarify that the use of the word "Water system" has the same meaning as "Public water system," as described in §290.38(71). Subsequent definitions are renumbered accordingly.

§290.42, Water Treatment

The commission proposes to amend §290.42(b)(1) and (e)(2) to clarify the association between §290.42(b)(1) and (e)(2) with the requirements of §290.110, concerning the disinfection, treatment, and monitoring requirements for public water systems that utilize a groundwater source.

The commission proposes to amend §290.42(d)(15)(D) to require surface water treatment plants that utilize chlorine dioxide to provide testing equipment for measuring chlorine dioxide and chlorite levels.

The commission proposes to add §290.42(g)(6) and (6)(A) and (B) to address the utilization of membrane filtration for virus removal that achieves at least 4-log removal of viruses to comply with the groundwater rule requirements under §290.109 and §290.116.

§290.46, Minimum Acceptable Operating Practices for Public Drinking Water Systems

The commission proposes to add §290.46(f)(3)(D)(x) and (xi) and amend (f)(3)(E)(ix) and (x) to require public water systems to maintain and update operating records concerning assessment forms, corrective actions, seasonal operating procedures, Sample Siting Plans, and membrane integrity testing results as required by the RTCR and GWR.

The commission proposes to amend §290.46(n)(3) to clarify the recordkeeping requirements for public water systems concerning well completion data as required by §290.41(c)(3)(A).

The commission proposes to amend §290.46(p)(1) to require the new owner or grantee of a public water system to notify the executive director of the change in ownership within 30 days after the effective date of the change in ownership and include any other information necessary to identify the transaction. In addition, the commission proposes adding definitions of "Grantee" and "Grantor" as discussed in §290.38 of this preamble. Finally, the commission proposes to remove the reference to 30 TAC Chapter 291 (Utility Regulations).

The commission proposes to amend §290.46(q) to clarify the subject matter of the subsection, which is special precautions, protective measures, and boil water notices. The amendment also adds the abbreviation *E. coli* and adds the language "or other approved fecal indicator" to be consistent with the federal GWR requirements as described in 40 CFR §141.402. The amendment adds a description of what special precautions, protective measures, and boil water notices are and when they shall be instituted by public water systems.

The commission proposes to amend §290.46(q)(1) to clarify when and how a public water system shall issue and rescind boil water notices. The commission proposes to add language to specify boil water notice delivery requirements by cross-referencing §290.122 and referencing the format specified in §290.47(c)(1) and (2).

The commission proposes to amend §290.46(q)(2) to clarify when a boil water notice shall be issued by a public water system in the event distribution system pressure is lost.

The commission proposes to add §290.46(q)(3) to specify that a public water system shall issue a boil water notice to customers for a violation of the acute maximum contaminant level (MCL) for *Escherichia coli* (*E. coli*) or other approved fecal indicator. The boil water notice shall be in accordance with rule requirements as described in §290.122(a)(1)(A) and to be consistent with the RTCR.

The commission proposes to amend §290.46(q)(4) to specify when a public system shall issue a boil water notice to customers for exceeding certain combined filter effluent turbidity levels at a water treatment plant in accordance with the rule requirements as described in §290.122(a)(1)(B) and to be consistent with the RTCR. The commission proposes adding §290.46(q)(4)(A) - (D) to summarize the conditions triggering a boil water notice for turbidity.

The commission proposes to add §290.46(q)(5) to clarify the circumstances when discretionary action by the executive director may be warranted concerning special precautions, protective measures, and boil water notices. The proposed rule requires the executive director to provide written notification to the public water system when exercising this discretionary action.

The commission proposes to add §290.46(q)(5)(A) and (A)(i) - (iii) to clarify the circumstances that may warrant the exercise of discretionary action by the executive director. Under proposed §290.46(q)(5)(A)(i), such circumstances include a public water system failing to provide required compliance information to the executive director and the failure results in the inability of the executive director to determine compliance with disinfection and treatment technique requirements for public water systems. Under proposed §290.46(q)(5)(A)(ii), such circumstances include prevention or correction of a potential or actual health hazard as defined in this chapter. Under proposed §290.46(q)(5)(A)(iii), the circumstances include a public water system which has failed to maintain adequate disinfectant residuals.

The commission proposes to add §290.46(q)(5)(B) to require that the executive directive provide written notification to a public water system when requiring the public water system to institute special precautions, protective measures, or issue boil water notices when the executive director exercises his discretionary action under this subsection. The proposed rule also establishes a time frame in which the public water system is required to implement the requirements.

The commission proposes to add §290.46(q)(5)(C) to establish that a public water system is required to provide any required information to the executive director when requested to document that the public water system has met the requirements for special precautions, protective measures, and boil water notices required under §290.46(q)(5).

The commission proposes to add §290.46(q)(6), which summarizes what actions are required to rescind a boil water notice. The proposed language clarifies that the executive director may provide written notification to the public water system once the public water system has provided compliance documentation to him. The proposed language establishes that the boil water notice shall remain in effect until the public water system establishes that it has met the applicable requirements. The applicable requirements are set forth in proposed §290.46(q)(6)(A) - (E), which incorporate requirements located in existing §290.46(q) and adds new language.

The commission proposes to add §290.46(q)(6)(A), with the requirements to rescind a boil

water notice for a public water system which experienced distribution system pressure issues.

The commission proposes to add §290.46(q)(6)(B), with the requirements to rescind a boil water notice for a public water system which experienced disinfectant residuals issues.

The commission proposes to add §290.46(q)(6)(C), with the requirements to rescind a boil water notice for a public water system which experienced turbidity issues.

The commission proposes to add §290.46(q)(6)(D), with the requirements to rescind a boil water notice for a public water system which failed to provide required compliance information to the executive director.

The commission proposes adding §290.46(q)(6)(E), with the water sampling and microbiological analysis requirements to rescind a boil water notice for a public water system which has met all other required actions to rescind a boil water notice. The commission proposes adding language requiring public water systems to collect representative water samples for microbiological analysis which meet specific laboratory labeling and analytical requirements and that the water sample laboratory analysis results are negative for coliform organisms before a public water system may rescind a boil water notice.

The commission proposes to add §290.46(q)(6)(F), which incorporates rule requirements

located in current §290.46(q)(1) and adds new language requiring a public water system to issue a notice rescinding a boil water notice within a specific time frame once the public water system has met the applicable requirements in proposed §290.46(q)(6)(A) - (E). The commission proposes adding language requiring a public water system to provide a copy of the rescind notice and associated microbial sample results to the executive director within a specific time frame, and to issue the rescind notice to customers in accordance with existing rule requirements in §290.122(f).

§290.47, Appendices

The commission proposes to amend existing §290.47(c) and add §290.41(c)(1) and Figure: 30 TAC §290.47(c)(1) to revise the mandatory boil water notice language that "community" public water systems are required to provide to customers and to add language which establishes that the mandatory boil water notice language is specific to "community" public water systems.

The commission proposes to add §290.47(c)(2) and Figure: 30 TAC §290.47(c)(2) to establish the mandatory boil water notice language that "noncommunity" public water systems are required to provide to customers, individuals, or employees.

The commission proposes to add §290.47(c)(3) and Figure: 30 TAC §290.47(c)(3) to establish the mandatory language to rescind a boil water notice that all public water systems are required to provide to customers, individuals, or employees.

§290.102, General Applicability

The commission proposes to amend §290.102(b)(1) to revise variances and exemptions as described in 40 CFR §141.4 by removing the total coliform MCL reference and adding *E. coli* to the list, which establishes that the executive director may not grant variances or exemptions from the MCL for *E. coli* and that the total coliform MCL is no longer applicable, which is consistent with 40 CFR §141.4 and the RTCR.

The commission proposes to add §290.102(g) to clarify compliance monitoring reporting requirements for public water systems to be consistent with 40 CFR §141.31 and be consistent with the amended rule requirements as described in §§290.106 - 290.109 and 290.113 - 290.115.

§290.103, Definitions

The commission proposes to amend §290.103(3) to clarify the definition of the term "Compliance cycle" to be consistent with 40 CFR §141.23(j), which requires all public water systems to monitor for inorganic chemicals at the time designated by the executive director during each compliance period during each nine-year compliance cycle, and be consistent with the amended rule in §290.106(c)(7)(A), which specifies nitrite monitoring requirements for public water systems.

The commission proposes to amend §290.103(4) to clarify the definition of the term "Compliance period" to be consistent with 40 CFR §§141.23, 141.24, and 141.26, which specifies monitoring requirements for public water systems concerning inorganic

chemicals, organic chemicals, and radionuclides; and requires public water systems to monitor for inorganic chemicals, organic chemicals, and radionuclides at the time designated by the executive director during each compliance period during each nine-year compliance cycle.

The commission proposes to amend §290.103(6) to clarify the definition of the term "Consecutive system" by adding the words "raw water or" prior to the existing "finished water" to be consistent with the applicability requirements as described in 40 CFR §141.400, which applies to all public water systems that use groundwater except that it does not apply to public water systems that combine all of their groundwater with surface water or with ground water under the direct influence of surface water prior to treatment. In addition to public water systems that provide "Finished water," as defined in proposed §290.103(19), existing §290.103(18), to customers from a groundwater source, the amended language will require public water systems that provide "Raw water," as defined in proposed §290.103(33), existing §290.103(30), to other public water systems that provide "Finished water" to customers will be subject to the GWR requirements as described in 40 CFR §141.400.

The commission proposes to add §290.103(9) to define the term "Domestic or other non-distribution system plumbing problem" as described in 40 CFR §141.2 to be consistent with the RTCR.

The commission proposes to add §290.103(26) to define the term "Level 1 assessment" as

described in 40 CFR §141.2 to be consistent with the RTCR.

The commission proposes to add §290.103(27) to define the term "Level 2 assessment" as described in 40 CFR §141.2 to be consistent with the RTCR.

The commission proposes to add §290.103(35) to define the term "Sanitary defect" as described in 40 CFR §141.2 to be consistent with the RTCR.

The commission proposes to add §290.103(36) to define the term "Seasonal public water system" as described in 40 CFR §141.2 to be consistent with the RTCR.

§290.104, Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels

The commission proposes to amend §290.104(e) to clarify the MCL for microbiological contaminants as described in 40 CFR §141.52, which is based on the presence or absence of *E. coli*, to be consistent with the RTCR.

§290.106, Inorganic Contaminants

The commission proposes to amend §290.106(c)(3) to correct a typographical error concerning the initial monitoring frequency for inorganic compounds (IOC) except asbestos. The commission proposes to amend the second use of the word "nitrate" in the existing paragraph from "nitrate" to "nitrite" to correct this typographical error.

The commission proposes to amend §290.106(c)(7)(A) to clarify the monitoring requirements for nitrite for public water systems and to be consistent with 40 CFR §141.23(j) which requires all public water systems to monitor for inorganic chemicals at the time designated by the executive director during each compliance period during each nine-year compliance cycle.

The commission proposes to amend §290.106(e) to clarify the reporting requirements for public water systems regarding the submission of laboratory analyses and reports to the executive director and to be consistent with 40 CFR §141.31.

§290.107, Organic Contaminants

The commission proposes to amend §290.107(e) to clarify the reporting requirements for public water systems regarding the submission of laboratory analyses and reports to the executive director and to be consistent with 40 CFR §141.31.

§290.108, Radionuclides Other than Radon

The commission proposes to amend §290.108(e) to clarify the reporting requirements for public water systems regarding the submission of laboratory analyses and reports to the executive director and to be consistent with 40 CFR §141.31.

§290.109, Microbial Contaminants

The commission proposes to amend §290.109(b)(1) to clarify the applicability requirements relating to the MCL for microbial contaminants and for public water

systems, consistent with the RTCR as described in 40 CFR §141.851.

The commission proposes to add §290.109(b)(1)(A) - (E) to clarify the applicability requirements relating to the MCL for *E. coli* for public water systems, consistent with the RTCR as described in 40 CFR §141.851.

The commission proposes §290.109(c), which establishes that public water systems shall comply with the requirements to conduct and complete assessments after exceeding any of the treatment technique triggers, as described in proposed (c)(1) and (2). The commission proposes to add this language to be consistent with the RTCR. Subsequent subsections are relettered accordingly.

The commission proposes to add §290.109(c)(1)(A) - (C) to establish the Level 1 treatment technique triggers and assessment requirements for microbial contaminants for public water systems to be consistent with the RTCR as described in 40 CFR §141.859.

The commission proposes to add §290.109(c)(2)(A) and (B) to establish the Level 2 treatment technique triggers and assessment requirements for microbial contaminants for public water systems to be consistent with the RTCR as described in 40 CFR §141.859. The commission proposes to add language which establishes the requirements for public water systems concerning the submission of documentation to the executive director to determine if a Level 2 assessment is required when a second Level 1 assessment trigger has occurred within a rolling 12-month period.

The commission proposes to add §290.109(c)(3)(A)(i) and (ii) to establish the Level 1 and Level 2 treatment technique assessment requirements for microbial contaminants for public water systems to be consistent with the RTCR as described in 40 CFR §141.859. Additionally, the commission proposes to add language to establish the Level 1 and Level 2 assessment assessor qualifications for public water systems to be consistent with the RTCR as described in 40 CFR §141.859.

The commission proposes to add §290.109(c)(3)(B)(i) - (vii) to establish the Level 1 and Level 2 assessment requirements and evaluation criteria for public water systems to be consistent with the RTCR as described in 40 CFR §141.859.

The commission proposes to add §290.109(c)(3)(C)(i) - (iii) to establish the Level 1 assessment requirements regarding completion deadlines, consultations with the executive director, and corrective actions for public water systems to be consistent with the RTCR as described in 40 CFR §141.859.

The commission proposes to add §290.109(c)(3)(D)(i) - (iii) to establish the Level 2 assessment requirements, regarding completion deadlines, consultations with the executive director, and corrective actions, for public water systems to be consistent with the RTCR as described in 40 CFR §141.859.

The commission proposes to add §290.109(c)(3)(E) and (F) to establish and further clarify

the Level 1 and Level 2 assessment requirements, regarding the correction of sanitary defects identified during Level 1 and Level 2 assessments and consultations with the executive director, for public water systems to be consistent with the RTCR as described in 40 CFR §141.859. Subsequent subsections are relettered accordingly.

The commission proposes to amend existing §290.109(c), proposed as §290.109(d), to establish microbial sampling location and Sample Siting Plan requirements for public water systems to be consistent with the RTCR as described in 40 CFR §141.859.

The commission proposes to amend existing §290.109(c)(1)(A), proposed as §290.109(d)(1)(A) and (B), to establish microbial sampling location and Sample Siting Plan requirements for public water systems to be consistent with the RTCR as described in 40 CFR §141.859.

The commission proposes to amend existing §290.109(c)(2)(A)(i) and (ii), proposed as §290.109(d)(2)(A)(i) and (ii), to clarify the methods in which public water system population data is established and reported to the executive director to determine microbial sampling frequency for public water systems to be consistent with the RTCR as described in 40 CFR §§141.853 - 141.857, and Texas Health and Safety Code (THSC), §341.033(d).

The commission proposes to amend existing §290.109(c)(2)(C), proposed as §290.109(d)(2)(C), to correct a typographical error concerning the use of the words "uses

only" which are repeated consecutively in the subparagraph. This revision will remove the second occurrence of these words.

The commission proposes to remove existing §290.109(c)(2)(F), replaced with proposed §290.109(d)(2)(F), to clarify and establish the routine microbial sampling frequency for public water systems to be consistent with the RTCR. This amended language establishes that public water systems that collect fewer than five routine distribution coliform samples per month will not be required to conduct increased routine microbial monitoring during the month following a month in which the public water system has one or more total coliform-positive samples.

The commission proposes to add §290.109(d)(2)(F) and (G) to clarify and establish the routine microbial sampling frequency for public water systems to be consistent with the RTCR. This language establishes that all public water systems shall collect at least the minimum number of required routine microbial samples even if the public water system has had an *E. coli* MCL violation or has exceeded the coliform treatment technique triggers. This language establishes that public water systems may conduct more microbial compliance monitoring than is required to investigate potential problems. This language establishes that if a public water system chooses to take more than the minimum number of required routine samples, the results of all samples shall be used in calculating whether the coliform treatment technique triggers have been exceeded. This language establishes that the routine sample sites shall be included in the public water system's Sample Siting Plan and requires that the samples be collected in accordance with the

Sample Siting Plan.

The commission proposes to amend existing §290.109(c)(3)(A), proposed as §290.109(d)(3)(A), to clarify the 24-hour repeat microbial sampling limit for public water systems to be consistent with the RTCR as described in 40 CFR §141.858. The language specifies that the executive director may extend the 24-hour limit for public water systems on a case-by-case basis under extenuating circumstances. The amended language specifies that all public water systems shall collect no fewer than three repeat samples for each total coliform-positive sample found.

The commission proposes to amend existing §290.109(c)(3)(A)(i) and (ii), proposed as §290.109(d)(3)(A), to clarify and establish the repeat microbial sampling requirements for public water systems which collect only one routine distribution coliform sample per month to be consistent with the RTCR as described in 40 CFR §141.858. The amended language specifies that these public water systems will no longer be required to collect four repeat samples for each coliform-positive sample found and that all public water systems shall collect no fewer than three repeat samples for each total coliform-positive sample found.

The commission proposes to amend existing §290.109(c)(3)(B), proposed as §290.109(d)(3)(B), to clarify the time frame in which repeat microbial sampling is required for public water systems to establish that all repeat samples shall be collected on the same day, except for public water systems with a single service connection may collect

daily repeat samples over a three-day period until the required number of repeat samples have been collected. This language is consistent with the RTCR as described in 40 CFR §141.858.

The commission proposes to amend existing §290.109(c)(3)(C), proposed as §290.109(d)(3)(C), to clarify the location in which repeat microbial samples are required to be collected for public water systems to establish that when a positive routine sample is collected at the end of the distribution system or one service connection away from the end of the distribution system, one repeat sample shall be collected at that point and all other samples shall be collected within five connections upstream of that point. This language is consistent with the RTCR as described in 40 CFR §141.853.

The commission proposes to amend existing §290.109(c)(3)(C)(i) - (iii), proposed as §290.109(d)(3)(C)(i) - (iii), which establishes that public water systems may propose alternative repeat microbial sampling locations to the executive director that are representative of a pathway for contamination of the distribution system. The proposed language specifies that the executive director may approve alternative microbial sampling locations for public water systems that elect to propose this repeat sample selection criteria option as an alternative to the repeat microbial sampling requirements as described in proposed §290.109(d)(3)(C). The language specifies that if a public water system proposes this option, they shall do so in a written standard operating procedure (SOP) included in its Sample Siting Plan as described in proposed §290.109(d)(6). The proposed language establishes that the executive director may approve public water

systems that use a groundwater source and serve 1,000 or fewer people to specify alternative microbial sampling locations in a written SOP. The language specifies that the executive director may approve a written SOP for public water systems that have only one groundwater well and serve 1,000 or fewer people which allows the public water system to collect one of its repeat samples at the location required for triggered source monitoring under the GWR and to use this sample to comply with both the repeat monitoring and triggered source monitoring requirements. This language is consistent with the RTCR as described in 40 CFR §141.853.

The commission proposes to amend existing §290.109(c)(3)(D), proposed as §290.109(d)(3)(D)(i) - (iii), to clarify the required 24-hour repeat microbial sampling limit for public water systems by adding language which specifies that the executive director may extend the 24-hour microbial sampling limit for public water systems under extenuating circumstances. The commission proposes to add language to establish the number of repeat microbial samples public water systems are required to collect based on the presence or absence of coliform bacteria, and exceeding coliform treatment technique triggers to be consistent with the RTCR as described in 40 CFR §141.858.

The commission proposes to amend existing §290.109(c)(4), proposed as §290.109(d)(4), to clarify the triggered source monitoring requirements for public water systems to be consistent with the GWR as described in 40 CFR §141.402. The commission proposes to add language to establish that the executive director may approve public water systems to collect a triggered source monitoring sample at an alternate location prior to any

treatment if the sample is representative of the water quality of that well.

The commission proposes to amend existing §290.109(c)(4)(A), proposed as §290.109(d)(4)(A), by adding the language "or other approved fecal indicator" to be consistent with the GWR requirements as described in 40 CFR §141.402.

The commission proposes to amend existing §290.109(c)(4)(A)(i), proposed as §290.109(d)(4)(A)(i), to revise the reference for the definition of "4-log treatment" in §290.103.

The commission proposes to remove existing §290.109(c)(4)(B)(iii), replaced with proposed §290.109(d)(4)(B)(iii) and add proposed §290.109(d)(4)(B)(iv) and (v), to establish that a public water system that uses a groundwater source, has only one well, and serves 1,000 people or fewer may use one of the three required repeat samples collected from a raw groundwater source to meet both the repeat microbial monitoring requirements as required under the RTCR and the triggered raw source monitoring requirements as required under the GWR. The commission proposes to add language which establishes that if one of the required repeat samples is used to meet both of the RTCR and GWR requirements and the sample is found to be *E. coli* positive, the public water system will have achieved an *E. coli* MCL violation which requires corrective action at the groundwater source where the *E. coli* positive sample taken. The commission proposes to add language which establishes that if the executive director does not require corrective action, then the public water system will be required to conduct additional microbial monitoring at

the groundwater source where the *E. coli* positive sample was detected. The commission also proposes to add language which establishes that public water systems will be able to conduct reduced microbial monitoring for groundwater sources under certain conditions.

The commission proposes to amend existing §290.109(c)(4)(C)(i) and (ii), proposed as §290.109(d)(4)(C)(i) and (ii), by adding the language "or other approved fecal indicator" to be consistent with the GWR requirements as described in 40 CFR §141.402.

The commission proposes to add §290.109(d)(4)(C)(iii) to establish public notification and triggered source monitoring requirements for public water systems that wholesale groundwater to other public water systems. The language specifies that if a wholesale groundwater system receives an *E. coli*-positive raw source sample result, the wholesale groundwater system shall notify all consecutive public water systems served by that groundwater source of the *E. coli*-positive result within 24 hours of being notified of the result, and the wholesale groundwater system shall conduct triggered source monitoring in accordance with proposed §290.109(d)(4)(B)(iv). The commission proposes to add this language to be consistent with the RTCR and the GWR requirements as described in 40 CFR §141.402.

The commission proposes to amend existing §290.109(c)(4)(E), proposed as §290.109(d)(4)(E), to clarify public notification requirements for public water systems that use groundwater sources and their consecutive public water systems. The language specifies that if a groundwater system receives a fecal indicator positive raw source

sample result, the groundwater system shall notify all consecutive public water systems served by that groundwater source of the fecal indicator positive result within 24 hours of being notified of the result. The commission proposes to add this language to be consistent with the GWR requirements as described in 40 CFR §141.402.

The commission proposes to amend existing §290.109(c)(5), proposed as §290.109(d)(5), to establish that public water systems will be required to ensure that if a routine or repeat microbial sample result is total coliform-positive, the total coliform-positive sample medium will be analyzed to determine if *E. coli* are present; and if *E. coli* are present in the sample, the public water system will be required to notify the executive director of the *E. coli* result by the end of the day. The commission proposes to add this language to be consistent with the RTCR as described in 40 CFR §141.858.

The commission proposes to amend existing §290.109(d)(1)(B), proposed as §290.109(e)(1)(B), to clarify that unless a total coliform-positive sample has been invalidated by the executive director, public water systems are required to collect the minimum number of required samples even if the system has had an *E. coli* MCL violation or has exceeded the coliform treatment technique triggers, and public water systems are required to continue to collect additional sets of repeat samples until either total coliforms are not detected in one complete set of repeat samples or it has been determined that a coliform treatment technique trigger has been exceeded as a result of a repeat sample being total coliform-positive. The commission proposes to add this language to be consistent with the RTCR as described in 40 CFR §141.853 and §141.858.

The commission proposes to amend existing §290.109(d)(1)(C), proposed as §290.109(e)(1)(C), to clarify that public water systems shall collect all repeat microbial samples as required and use all valid repeat samples to assist in determining compliance with the *E. coli* MCL and whether a coliform treatment technique trigger has been exceeded.

The commission proposes to amend existing §290.109(d)(2)(A) and (B), proposed as §290.109(e)(2)(A) and (B), by adding the language "or other approved fecal indicator" to be consistent with the GWR requirements as described in 40 CFR §141.402.

The commission proposes to add §290.109(d)(6) and (6)(A) - (E) to require public water systems to develop a Sample Siting Plan which identifies microbial routine and repeat sampling sites, a sample schedule that that are representative of water throughout the distribution system, all groundwater sources, and any associated sampling points necessary to meet the RTCR and GWR requirements. The commission proposes to add language which establishes that the Sample Siting Plan is subject to review and revision by the executive director and shall be included in the public water system's monitoring plan to be consistent with the RTCR. The commission proposes to add language to require public water systems to develop Sample Siting Plans in a format specified by the executive director and that the Sample Siting Plans are subject to review and revision by the executive director to be consistent with the RTCR. The commission proposes to add the language, "in a format specified by the executive director," to provide review

consistency in determining that Sample Siting Plans identify microbial routine and repeat sampling sites and a sample schedule that that are representative of water throughout the distribution system to be consistent with the RTCR. The commission proposes to add language to require public water systems to collect routine and repeat microbial samples and any other samples necessary to meet the requirements of the RTCR and GWR according to their written Sample Siting Plan and that these sample site locations shall be reflected in their Sample Siting Plan to be consistent with the RTCR. The commission proposes to add language that requires public water system's to include any SOP for proposed repeat microbial monitoring as described in §290.109(d)(3) in their Sample Siting Plan to be consistent with the RTCR. The commission proposes to add language to establish that the executive director may review, revise, and approve any proposed SOP as required by the executive director to be consistent with the RTCR. The commission proposes to add language to require public water systems to include a distribution system map, which is required under existing rule requirements as described in §290.46(n)(2), with their Sample Siting Plan. The commission proposes to add language, in addition to the existing rule requirements as described in §290.46(n)(2), which requires public water systems to include the location of all routine microbial sample sites, water main sizes, entry point source locations, water storage facilities, and any pressure plane boundaries in their distribution system map. The commission proposes to add this language to provide review consistency and assist in determining that Sample Siting Plans identify routine microbial sample site locations that that are representative of water throughout the distribution system to be consistent with the RTCR. The commission proposes to add language which requires public water systems to update their written

Sample Siting Plan as necessary, or as requested by the executive director, to identify the most current microbial routine and repeat sampling sites and a sample collection schedule to be consistent with the RTCR. The commission proposes to add language which requires public water systems to maintain a copy of their Sample Siting Plan on file at the public water system for inspection purposes and to submit a copy of their Sample Siting Plan to the executive director upon request to be consistent with existing recordkeeping rule requirements.

The commission proposes to amend existing §290.109(e), proposed as §290.109(f), to clarify the reporting requirements for public water systems regarding the submission of laboratory analyses and reports to the executive director to be consistent with 40 CFR §141.31.

The commission proposes to remove existing §290.109(f)(1) - (3), proposed as §290.109(g)(1) and (2), to clarify the MCL compliance determination criteria for public water systems regarding microbial contaminants to be consistent with the RTCR as described in 40 CFR §141.63.

The commission proposes to add §290.109(g)(1)(A) - (D) to establish the *E. coli* MCL violation compliance determination criteria for public water systems regarding microbial contaminants to be consistent with the RTCR as described in 40 CFR §141.63.

The commission proposes to add §290.109(g)(1)(E)(i) – (v), to identify for public water

systems the best technology, treatment techniques, or other means available for achieving compliance with the MCL for *E. coli* to be consistent with the RTCR as described in 40 CFR §141.63. The commission also proposes to add §290.109(g)(1)(E)(vi) to establish that the executive director may require additional best technology, treatment techniques, or other means available for achieving compliance with the MCL for *E. coli.*

The commission proposes to add §290.109(g)(2) to establish *E. coli* MCL violation scenarios for public water systems regarding repeat samples collected for triggered source monitoring to be consistent with the RTCR as described in 40 CFR §141.853.

The commission proposes to amend existing §290.109(f)(5), proposed as §290.109(g)(4) and add (5), to establish microbial monitoring violations for public water systems to be consistent with the RTCR as described in 40 CFR §141.860.

The commission proposes to remove existing §290.109(f)(9) replaced with proposed §290.109(g)(9), to establish for public water systems that the results of all routine and repeat distribution coliform samples not invalidated by the executive director shall be included in determining compliance with the *E. coli* MCL and whether a coliform treatment technique trigger has been exceeded to be consistent with the RTCR as described in 40 CFR §141.21(b)(7) and §141.858(a)(5).

The commission proposes to amend existing §290.109(f)(10), proposed as §290.109(g)(10), to establish for public water systems that the results of all routine and

repeat distribution coliform samples invalidated by the executive director shall not be included in determining compliance with the *E. coli* MCL and whether a coliform treatment technique trigger has been exceeded to be consistent with the RTCR as described in 40 CFR §141.21(c) and §141.853(c).

The commission proposes to add §290.109(g)(12) to establish the start-up procedures, certification requirements, and reporting violations for seasonal public water systems as defined in §290.103(36) to be consistent with the RTCR as described in 40 CFR §141.854 and §141.861. The commission proposes to add language that requires all seasonal public water systems to demonstrate completion of an executive director-approved start-up procedure and certification prior to serving water to the public.

The commission proposes to add §290.109(g)(13) to establish the treatment technique violation requirements for seasonal public water systems to be consistent with the RTCR as described in 40 CFR §141.860.

The commission proposes to add §290.109(g)(14) to establish the treatment technique violation for public water systems when a system exceeds a treatment technique trigger and then fails to conduct the required assessment or corrective actions within the specified timeframe to be consistent with the RTCR as described in 40 CFR §141.860.

The commission proposes to add §290.109(g)(15) to establish the assessment, corrective actions, and reporting requirements for public water systems to be consistent with the

TCR as described in 40 CFR §141.859.

The commission proposes to amend existing §290.109(g)(2) and (3), proposed as §290.109(h)(2) and (3), by adding the language "or other approved fecal indicator" to be consistent with the GWR requirements as described in 40 CFR §141.402.

The commission proposes to add §290.109(h)(5) to establish the reporting requirements for public water systems regarding an *E. coli* MCL violation to be consistent with the GWR requirements as described in 40 CFR §141.860.

The commission proposes to add §290.109(h)(7) to establish the reporting requirements for public water systems regarding an *E. coli* MCL violation to be consistent with the GWR requirements as described in 40 CFR §141.860.

§290.110, Disinfectant Residuals

The commission proposes to amend §290.110(c)(4)(D) to clarify the residual disinfectant concentration monitoring requirements for public water systems during microbial monitoring activities and in accordance with existing residual disinfectant concentration monitoring requirements to be consistent with the RTCR as described in 40 CFR §§141.74, 141.132, 141.854, and 141.858.

The commission proposes to amend §290.110(d)(2) and remove the requirements in subsection (d)(2)(A) - (C), to clarify the monitoring requirements for public water systems

using chlorine dioxide and to establish executive approval requirements for certain monitoring equipment for testing chlorine dioxide.

The commission proposes to amend §290.110(f)(8) to revise a grammatical reference and establish that public water systems shall consult with the executive director upon increasing residual disinfectant levels in the distribution system in order to maintain compliance with the Maximum Residual Disinfectant Levels (MRDL).

The commission proposes to amend §290.110(g)(3) and remove the requirements in subsection (g)(3)(A) and (B) to clarify that a public water system shall provide notice to customers in accordance with §290.122 when the public water system does not demonstrate an adequate residual disinfectant concentration in more than 5.0% of the samples collected each month for two consecutive months.

§290.111, Surface Water Treatment

The commission proposes to amend §290.111(d)(4)(D) and remove the requirements in subsection (d)(4)(D)(i) and (ii) to clarify the required analytical methods used for measuring the chlorine dioxide residual and analytical methods that require written permission of the executive director.

The commission proposes to amend §290.111(e)(4) to clarify when public water systems are required to conduct a special investigation concerning the removal/inactivation of pathogens during the surface water treatment process.

The commission proposes to add §290.111(e)(4)(A)(iv) and (C) to establish criteria for public water systems concerning when they may be required to participate in a special investigation conducted by the executive director.

The commission proposes to amend §290.111(e)(5)(A) and remove the requirements in subsection (e)(5)(A)(i) - (iii) to clarify the required analytical methods used for measuring turbidity.

The commission proposes to add §290.111(e)(5)(E)(i) - (iii) to establish and clarify the precision and accuracy requirements for turbidity monitoring equipment and associated data recording devices used to measure and record combined filter and individual filter effluent turbidity levels.

The commission proposes to add §290.111(f)(3)(F)(i) - (iii) to establish and clarify the precision and accuracy requirements for turbidity monitoring equipment and associated data recording devices used to measure and record combined filter and individual filter effluent turbidity levels.

The commission proposes to add §290.111(f)(4)(A) - (C) to establish criteria for public water systems concerning when they may be required to participate in a special investigation conducted by the executive director.

The commission proposes to amend §290.111(i)(3) and add §290.111(i)(3)(A) - (E) to establish the acute treatment technique violation conditions and public notice and boil water notice requirements when a public water system fails to meet specific treatment, turbidity level, monitoring, and/or reporting requirements.

The commission proposes to amend §290.111(i)(4) and add §290.111(i)(4)(A) - (D) to establish the acute treatment technique violation conditions and public notice requirements when a public water system fails to meet specific treatment, turbidity level, monitoring, and/or reporting requirements.

§290.112, Total Organic Carbon (TOC)

The commission proposes to amend §290.112(f)(3)(A) to clarify the formula and method for calculating and determining the actual monthly TOC percent removal in a TOC sample set.

The commission proposes to amend §290.112(f)(3)(D) and (E) to clarify the terminology of the annual average TOC removal ratio and the method for calculating and determining the annual average TOC removal ratio.

§290.113, Stage 1 Disinfection Byproducts (TTHM and HAA5)

The commission proposes to amend §290.113(e) to clarify the reporting requirements for public water systems regarding the submission of laboratory analyses and reports to the executive director to be consistent with 40 CFR §141.31.

§290.114, Other Disinfection Byproducts (Chlorite and Bromate)

The commission proposes to amend §290.114(a)(3)(A) and remove the requirements in §290.111(a)(3)(A)(i) and (ii) to clarify that public water systems are required to use facilities that are approved by the executive director for the analysis of chlorite concentrations in water entering the distribution system.

The commission proposes to amend §290.114(a)(4)(B) to clarify the reporting requirements for public water systems regarding the submission of any required chlorite test, measurement, or analysis to the executive director to be consistent with 40 CFR §141.31.

The commission proposes to amend §290.114(b)(4) to clarify to clarify the reporting requirements for public water systems regarding the submission of laboratory analyses and reports to the executive director to be consistent with 40 CFR §141.31.

§290.115, Stage 2 Disinfection Byproducts (TTHM and HAA5)

The commission proposes to amend §290.115(e)(1) to clarify to clarify the reporting requirements for public water systems regarding the submission of laboratory analyses and reports to the executive director to be consistent with 40 CFR §141.31.

§290.116, Groundwater Corrective Actions and Treatment Techniques

The commission proposes to amend §290.116(a) to clarify the applicability requirements

for public water systems to be consistent with the GWR and RTCR as described in 40 CFR §141.859. This amended language specifies the treatment technique and corrective action requirements for public water systems that use groundwater sources to be consistent with the GWR and the treatment technique and corrective action requirements for these public water systems when they have exceeded a treatment technique trigger under the RTCR as described in §141.859.

The commission proposes to amend §290.116(a)(1) and (2) to establish that public water systems that use groundwater sources shall receive prior written approval from the executive director before the public water system discontinues the use of 4-log treatment for their groundwater sources to be consistent with the GWR.

The commission proposes to amend §290.116(b)(5) to clarify the corrective action plan and approval requirements for public water systems that are required to complete the corrective action to be consistent with the GWR.

The commission proposes to amend §290.116(c) by removing the words "or in lieu of the" and adding the words "instead of conducting" to clarify the microbial inactivation and removal requirements for public water systems that treat groundwater sources in response to a fecal indicator positive source sample or significant deficiency, instead of conducting raw groundwater source monitoring, shall meet minimum requirements demonstrating at least 4-log treatment of viruses to be consistent with the GWR.

The commission proposes to amend §290.116(c)(2) and add the requirements in §290.116(c)(2)(A) and (B) to include and establish the monitoring and operating requirements for membrane treatment systems and to specify the approval process for monitoring and recording the performance of these alternative treatment technologies to be consistent with the GWR.

The commission proposes to add §290.116(c)(3)(F) to establish that membrane treatment system integrity monitoring shall be conducted in accordance with executive director specified requirements to be consistent with the GWR.

The commission proposes to amend §290.116(c)(4) to clarify the recordkeeping applicability requirements for public water systems to be consistent with the GWR.

The commission proposes to amend §290.116(d) by removing the words "in lieu of the" and "to conduct" and adding the words "instead of conducting" to clarify that public water systems that treat groundwater sources in response to a fecal indicator positive source sample or significant deficiency, instead of conducting raw groundwater source monitoring, shall report to the executive director to be consistent with the GWR.

The commission proposes to add §290.116(d)(6) to establish the reporting requirements for public water systems that are required to conduct integrity monitoring for membrane treatment systems for groundwater sources.

The commission proposes to amend §290.116(e)(4) and (5) to clarify the compliance monitoring and reporting requirements for public water systems that use membrane systems to treat groundwater sources.

The commission proposes to amend §290.116(f)(1) to clarify and establish the public notification requirements for community public water systems that use groundwater sources when the public water system receives notice from the executive director of a significant deficiency or notification of a fecal indicator positive groundwater source sample to be consistent with the GWR. This amended language requires these public water systems to provide public notice to customers on an annual basis until the significant deficiency is corrected or the fecal contamination in the groundwater source is corrected as determined by the executive director.

§290.117, Regulation of Lead and Copper

The commission proposes to amend §290.117(c)(2)(D)(i) - (vi) to add the word "reduced" to clarify the reduced nine-year tap sampling requirements for public water system's regarding lead and copper monitoring to be consistent with the federal Lead and Copper Rule Minor Revisions (LCRMR) as described in 40 CFR §141.85. This amended language removes the word "waiver" and replaces it with "schedule" for consistency with amended rule language. This amended language will provide clarification concerning the executive director's authority to modify reduced nine-year tap sampling schedules.

The commission proposes to amend §290.117(c)(2)(D)(vii) by removing the executive

director's approval of waivers regarding the lead and copper nine-year tap sampling requirements for public water systems that received such waivers. This amended language is consistent with a new provision under the LCRMR and supersedes pre-existing waivers that were granted for lead and copper tap monitoring. This amended language will provide clarification for public water systems with state-approved waivers that the waivers are no longer valid in accordance with the LCRMR provision. The public water systems that were granted waivers will be eligible for reduced nine-year monitoring if the public water system meets the federal criteria outlined in the LCRMR and will be required to re-apply for reduced monitoring every nine years.

The commission proposes to amend §290.117(e) to remove and clarify an incorrect table reference and to clarify the applicability of Water Quality Monitoring Parameters (WQP) within subsection (e).

The commission proposes to amend §290.117(e)(1) by adding the words "take two samples" to clarify the sampling requirements for public water system's relating to monitoring for water quality parameters to be consistent with the LCRMR as described in 40 CFR §141.87(a)(2). This amended language requires public water systems to also take two samples at all raw water WQP sites in addition to entry points and distribution WQP sites in accordance with the table referenced in Figure: 30 TAC §290.117(e)(1). The requirement to monitor at raw water WQP sites was added to be consistent with the March 2016 EPA *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems* guidance document.

The commission proposes to add §290.117(e)(1)(C) to establish the raw water monitoring requirements for WQP sample sites to be consistent with the March 2016 EPA *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems* guidance document.

The commission proposes to amend §290.117(e)(2) to establish the initial and routine raw water monitoring requirements for WQP sample sites to be consistent with the March 2016 *EPA Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems* guidance document.

The commission proposes to amend Figure: 30 TAC §290.117(e)(2) to include raw water monitoring WQP sample sites in the title and to include total dissolved solids, sodium, sulfate, chloride, hardness, manganese, and iron as additional WQP monitoring parameters to be consistent with the March 2016 EPA *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems* guidance document.

The commission proposes to amend §290.117(e)(2)(A) to establish the initial and routine raw water monitoring requirements for WQP sample site locations as referenced in Figure: 30 TAC §290.117(e)(1) to be consistent with the March 2016 EPA *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems* guidance document.

The commission proposes to amend §290.117(e)(2)(B) to establish the frequency for initial and routine WQP monitoring on a quarterly basis to reflect seasonal variability in water quality conditions to be consistent with the March 2016 EPA *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems* guidance document.

The commission proposes to amend §290.117(e)(3) to establish the entry point and distribution WQP monitoring requirements for public water systems after the installation of corrosion control treatment as referenced in Figure: 30 TAC §290.117(e)(3). This amended language clarifies the Figure: 30 TAC §290.117(e)(3) table reference.

The commission proposes to amend Figure: 30 TAC §290.117(e)(3) to amend the title and to include calcium, total dissolved solids, temperature, sodium, sulfate, chloride, hardness, manganese, and iron as additional WQP monitoring parameters and remove the requirement to measure calcium if calcium carbonate stabilization is used as part of corrosion control to be consistent with the March 2016 EPA *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems* guidance document.

The commission proposes to amend §290.117(e)(4) to clarify the Figure: 30 TAC §290.117(e)(4) table reference.

The commission proposes to amend §290.117(f)(1)(C) to clarify the reference to corrosion control treatment methods as described in §290.117(f)(1)(B) and to make grammatical revisions.

The commission proposes to amend §290.117(i)(4)(B)(i) - (iii) to add the word "reduced" to clarify the reduced nine-year tap sampling requirements for public water system's regarding lead and copper monitoring to be consistent with the LCRMR as described in 40 CFR §141.85. This amended language removes the word "waiver" and replaces it with "schedule" for consistency with amended rule language.

The commission proposes to amend §290.117(k)(2)(B)(i) and (ii) and remove §290.117(k)(2)(B)(iii), to establish that community public water systems serving 3,300 or fewer people are allowed to limit certain aspects of their public education programs by distributing required public education materials to facilities and organizations served by the public water system that are most likely to be visited regularly by pregnant women and children. This amended language allows community public water systems serving 3,300 or fewer people the option to distribute notices to every household served by the public water system instead of delivering notices by media release. This amended language requires community public water systems serving 3,300 or fewer people to implement at least one of nine possible options to deliver public education materials to customers.

§290.118, Secondary Constituent Levels

The commission proposes to amend §290.118(g)(1) to clarify terminology for public water systems regarding secondary constituent levels to be consistent with existing rule language.

§290.119, Analytical Procedures

The commission proposes to amend §290.119(b)(1) to reference and include the acceptable federal analytical methods as described in 40 CFR §141.852. This language will specify that public water systems are required to conduct total coliform and *E. coli* analyses in accordance with the analytical methods or alternative methods as described in 40 CFR §141.852 to be consistent with the RTCR.

§290.121, Monitoring Plans

The commission proposes to add §290.121(b)(3) to require public water systems to include a list of all repeat microbial sample sites which are associated to their originating routine microbial sample sites in a Sample Siting Plan to be consistent with the RTCR as described in 40 CFR §141.853. The RTCR requires public water systems to include routine and repeat microbial sample sites in a Sample Siting Plan. The amended language specifies that the Sample Siting Plan shall be included in the public water system's monitoring plan. This requirement is included in the amended rule language regarding Sample Siting Plans as described in §290.109.

§290.122, Public Notification

The commission proposes to amend §290.122(a) to establish the Tier 1 public notice

category and to describe that a Tier 1 public notice is associated to acute violations or situations with significant potential to have serious adverse effects on human health as a result of short-term exposure and which require a Tier 1 public notice. The commission proposes to amend this language to be consistent with 40 CFR Part 141, Subpart Q.

The commission proposes to amend §290.122(a)(1)(A) to establish that a Tier 1 public notice is required for a violation of the *E. coli* MCL as described in §290.109(g)(1)(A) - (D) and that the acute MCL for microbial contaminants is no longer applicable to be consistent with the RTCR as described in 40 CFR §141.63 and §141.860.

The commission proposes to add §290.122(a)(1)(B)(v) and (vi) to establish the Tier 1 public notice requirements when a public water system fails to meet specific treatment, turbidity level, monitoring, and/or reporting requirements as described in §290.111(i)(3) and (4).

The commission proposes to amend §290.122(a)(2) to clarify and establish the methods in which public water systems are required to issue a Tier 1 public notice to customers to be consistent with 40 CFR Part 141, Subpart Q. The commission proposes to amend this language to specify that public water systems shall issue the initial Tier 1 public notice to customers for an acute violation or situation in one or more manners that are reasonably calculated to reach persons served by the public water system within the required time period. The commission proposes to amend language to specify that public water systems are no longer required to issue a Tier 1 public notice by using two of the

approved methods described in rule and are now allowed to issue a Tier 1 public notice by using one or more of the approved methods described in rule to be consistent with 40 CFR §141.202.

The commission proposes to amend §290.122(a)(2)(A) to clarify the Tier 1 public notice and/or boil water notice requirements when a public water system fails to meet specific treatment, turbidity level, monitoring, and/or reporting requirements as referenced in §290.122(a)(1)(B)(vi) and described in §290.111(i)(4).

The commission proposes to remove §290.122(a)(4) to establish that public water systems are not required to issue a public notice to customers when the public water system has corrected a Tier 1 acute violation or situation to be consistent with 40 CFR Part 141, Subpart Q.

The commission proposes to amend §290.122(b) to establish the Tier 2 public notice category and to describe that a Tier 2 public notice is associated to other MCL, MRDL, or treatment technique violations and for variance and exemption violations which are violations and situations with potential to have serious adverse effects on human health and which require a Tier 2 public notice. The commission proposes to amend this language to be consistent with 40 CFR Part 141, Subpart Q.

The commission proposes to amend §290.122(b)(2) to provide consistency with revised terminology concerning Tier 2 public notices to be consistent with 40 CFR Part 141,

Subpart Q.

The commission proposes to remove §290.122(b)(4) to establish that public water systems are not required to issue a public notice to customers when the public water system has corrected a Tier 2 violation to be consistent with 40 CFR Part 141, Subpart Q.

The commission proposes to amend §290.122(c) and (c)(1) to establish the Tier 3 public notice category and to describe that a Tier 3 public notice is associated with other violations, situations, variances, and exemptions as defined and which require a Tier 3 public notice. The commission proposes to amend this language to be consistent with 40 CFR Part 141, Subpart Q.

The commission proposes to add §290.122(c)(1)(F) - (K) to require a community and nontransient, noncommunity public water system to provide notification to its customers of the availability of unregulated contaminant monitoring results. These systems will also be required to issue a Tier 3 public notice to customers in the event the public water system fails to notify customers of the availability of unregulated contaminant monitoring results to be consistent with 40 CFR §141.204 and §141.207. The commission proposes to add language to establish that a public water system is required to issue a Tier 3 public notice for failure to maintain any assessment form and documentation of corrective actions completed as a result of those assessments to be consistent with 40 CFR §141.204 and §141.861. The commission proposes to add language to establish that a public water system is required to issue a Tier 3 public notice for failure to maintain a

record of any repeat sample taken that meets the criteria for an extension of the 24-hour period for collecting repeat samples to be consistent with 40 CFR §141.204 and §141.861. The commission proposes to add language that may require public water systems to issue a Tier 1 public notice instead of a Tier 3 public notice for other violations or situations deemed by the executive director to pose an acute risk to human health or with significant potential to have serious adverse effects on human health as a result of short-term exposure to be consistent with 40 CFR §141.202. The commission proposes to add language that may require public water systems to issue a Tier 2 public notice instead of a Tier 3 public notice for other violations or situations, at the discretion of the executive director, which take into account potential health impacts and persistence of the violation and failure to comply with the terms and conditions of any variance or exemption to be consistent with 40 CFR §141.203.

The commission proposes to amend §290.122(c)(2) to clarify and establish the methods in which public water systems are required to issue the initial and repeat Tier 3 public notices to customers to be consistent with 40 CFR §141.204. The commission proposes to add language to specify that public water systems shall issue the initial Tier 3 public notice to customers not later than one year after the public water system learns of the violation or situation or begins operating under a variance or exemption. The commission proposes to add language to specify that public water systems shall issue the repeat Tier 3 public notice to customers annually for as long as the violation, variance, exemption, or other situation persists. The commission proposes to add language to specify that if the public notice is posted, the notice shall remain in place for as long as the violation,

variance, exemption, or other situation persists, but in no case less than seven days even if the violation or situation is resolved. The commission proposes to amend language to specify that public water systems are no longer required to issue a Tier 3 public notice within three months of the violation or the granting of a variance or exemption and may now issue a Tier 3 public notice on an annual basis unless otherwise specified by rule to be consistent with 40 CFR §141.204.

The commission proposes to add §290.122(c)(2)(C)(i) - (iii) to establish the criteria that allows community public water systems to use their annual Consumer Confidence Report (CCR) for delivering the initial Tier 3 public notice and all required repeat Tier 3 public notices to be consistent with 40 CFR §141.204.

The commission proposes to amend §290.122(c)(3)(A) to establish the criteria that allows community public water systems to use their annual CCR for delivering repeat Tier 3 public notices to be consistent with 40 CFR §141.204.

The commission proposes to amend §290.122(c)(4) to establish that public water systems are not required to issue a public notice to customers when the public water system has corrected a Tier 3 violation to be consistent with 40 CFR Part 141, Subpart Q.

The commission proposes to amend §290.122(f) to clarify the reporting methods for public water systems regarding the proof of public notification delivery.

The commission proposes to amend §290.122(g) to clarify the public notification requirements for public water systems that sell or provide drinking water to other public water systems (i.e., consecutive systems) and to clarify that consecutive systems are responsible for and shall provide public notice to the persons it serves to be consistent with 40 CFR §141.201(c)(1).

§290.272, Content of the Report

The commission proposes to add §290.272(b)(1)(A) and (B) to establish the content requirements for CCR regarding Level 1 and Level 2 assessments to be consistent with the RTCR, as described in 40 CFR §141.153.

The commission proposes to amend §290.272(c)(4)(D) and (D)(i) to establish the content requirements for CCR regarding contaminants subject to an MCL, except turbidity, total coliform, fecal coliform, and *E. coli* to be consistent with the RTCR.

The commission proposes to amend §290.272(c)(4)(G) and (H) to establish the content requirements for CCR regarding *E. coli* reporting to be consistent with the RTCR.

The commission proposes to add §290.272(d)(4) to establish the content requirements for CCR regarding community and nontransient, noncommunity public water systems that exceed the secondary constituent level for fluoride but are below the MCL.

The commission proposes to add §290.272(g)(9) - (11) to establish the content

requirements for CCR regarding Level 1 or Level 2 assessments, associated corrective actions, monitoring and reporting, and the *E. coli* MCL to be consistent with the RTCR.

The commission proposes to add §290.272(h) to establish the content requirements for CCR regarding when a public water system detects *E. coli* and has not violated the *E. coli* MCL to be consistent with the RTCR, as described in 40 CFR §141.153.

§290.275, Appendices A - D

The commission proposes to amend Figure: 30 TAC §290.275(3) to establish the mandatory health effects language required for CCR regarding coliforms and *E. coli* bacteria to be consistent with the RTCR.

Fiscal Note: Costs to State and Local Government

Jeffrey Horvath, Analyst in the Chief Financial Officer Division, determined that for the first five-year period the proposed rules are in effect, fiscal implications, which may be significant, are anticipated for the agency and for other units of state or local government as a result of the administration or enforcement of the proposed rules.

These rules are proposed in order to conform agency rules to the RTCR promulgated by the EPA. Under federal regulations, TCEQ shall adopt rules at least as stringent as the federal rules in order to maintain primacy over the federal Public Water System Supervision Program in Texas. This rulemaking also proposes to address EPA's comments on TCEQ's adopted GWR; and to provide consistency with other federal provisions,

including: the Lead and Copper Rule; the Total Organic Carbon Rule; public notice requirements; disinfection and analytical requirements; and other federal monitoring and reporting requirements.

In addition, this rulemaking proposes to provide clarification and streamline existing commission rules regarding: state monitoring and ownership reporting requirements; boil water notice reporting and requirements for special precautions, protective measures, boil water notices, and special investigation requirements for elevated turbidity levels and for failure to provide compliance data; disinfection operating reports; and water well recordkeeping requirements.

Public water systems owned by local governments (cities, counties, water districts, river authorities, and utility districts) will be affected by the proposed rules. In particular, public water systems will be affected by the proposed changes that correspond with the RTCR. Agency staff estimates that there are approximately 3,013 local governmental entities that own public water systems in Texas.

Under the proposed rules, local governmental entities that own public water systems will be required to revise their existing Sample Siting Plans for the collection of total coliform samples. These public water systems will also be required to conduct Level 1 and Level 2 assessments of their system if they trigger certain requirements and will be required to conduct any corrective actions associated with those Level 1 and Level 2 assessments. Corrective actions associated with Level 1 and Level 2 assessments could range from

minor to major activities associated with maintenance, treatment, and distribution system infrastructure improvements. Finally, if applicable, public water systems will be required to perform seasonal start-up procedures and provide certification to the executive director that the required seasonal start-up activities have been completed.

Costs to perform these activities are difficult to estimate and would vary due to the difference and variability in size, type, and configuration of each public water system's distribution system. The additional activities may require local governmental entities who own public water systems to hire consultants to develop: 1) Sample Siting Plan revisions; 2) Level 1 or Level 2 assessments; 3) corrective actions; or 4) seasonal start-up procedures. Costs associated with Level 1 and Level 2 assessments could be significant for activities concerning maintenance, treatment, and distribution system infrastructure improvements. The EPA has indicated that the overall net increase in costs for most of the public water systems serving greater than 4,100 people will be driven primarily by the requirements to conduct assessments and to conduct necessary corrective actions when sanitary defects are identified. Public water systems will be required to update their water distribution map to include the location of microbial sampling sites, water main sizes, entry point source locations, water storage facilities, any pressure plane boundaries, and include their water distribution map with their Sample Siting Plan.

Under the proposed agency rules separate from the RTCR rules, public water systems may be required to issue boil water notices to customers at the discretion of the executive director in addition to pre-existing requirements. Public water systems will also

be required to provide boil water rescind notifications to customers. These requirements are not expected to result in significant fiscal implications for the agency or public water systems.

Some cost savings may be anticipated for some local governmental entities that own public water systems serving 4,900 or fewer customers. Under the RTCR, these systems will only be required to take three repeat samples instead of five after receiving an initial routine sample result that is positive for the presence of coliform. In addition, these public water systems will no longer be required to collect five microbial samples the month following a month in which the public water system received a total coliform-positive sample result. Sample collection and analysis cost an average of $25 - $40 per sample and the cost savings vary depending on the type and size of the public water system.

Public water systems may also realize a cost savings due to the proposed conformity with federal rules as they concern public notice requirements. Specifically, public water systems would not be required to issue a Tier 1 public notice using two of the approved methods, but instead would be allowed to issue a Tier 1 public notice using one or more of the approved methods. In addition, public water systems would not be required to issue a Tier 3 public notice within three months and would be allowed to issue a Tier 3 public notice on an annual basis.

Other minor cost savings may be expected for those public water systems allowed to

issue public notice to customers for certain violations on an annual basis rather than within 90 days. Community public water systems will be allowed to issue required notices in their annual CCR, and all other public water systems will be required to issue notices by posting or other means. Cost savings will vary due to the differences in size and type of the public water system.

TCEQ will be responsible for providing a thorough review and approval of the reports generated from the RTCR Level 1 and Level 2 assessments of the distribution systems of public water systems. Staff will have to track and review the completion of the RTCR required corrective actions associated with distribution systems assessments and verify compliance. Staff will also review, on a continuing basis, revisions to the RTCR Sample Siting Plans of approximately 6,900 public water systems. Some of these reviews will also require evaluations of the distribution systems. Staff will also provide consultation to public water systems on addressing any distribution system deficiencies identified during the RTCR distribution system assessments. Staff will also review qualifications for personnel proposed by public water systems to perform the RTCR Level 1 and Level 2 assessments and determine if they meet regulatory criteria. Finally, staff will review and evaluate on annual basis the certification of the RTCR start-up procedures for public water systems that operate on seasonal basis.

At this time the agency does not have sufficient staff resources to implement the proposed rules. The agency may request additional funding in the next legislative session or reallocate resources to fund the proposed changes. Fourteen full-time equivalent

employees (FTEs) will be required.

The 14 FTEs will be required to conduct daily compliance reviews and provide technical and regulatory assistance with the RTCR Sample Siting Plans, seasonal start-up procedures, distribution system assessments, corrective actions to address distribution system deficiencies, provide specialized compliance assistance, technical and regulatory training for and maintenance of approved assessment providers, and training activities. The FTEs will be required to monitor and track required plan reviews and exception requests for public water systems that have triggered Level 1 and Level 2 assessments. The FTEs will be required to provide coordination and outreach between the EPA, Office of Water, and Office of Compliance and Enforcement concerning these activities and any associated enforcement actions.

The FTEs will be required to conduct enhanced investigations of community distribution systems at a minimum of once every five years in addition to the currently required Comprehensive Compliance Investigations conducted at public water systems once every three years. An enhanced evaluation of the distribution system would include, but not be limited to, a review of the RTCR, nitrification, and lead/copper monitoring plans, as well as review of the sample analysis and sampling locations, monthly operating reports, etc. Investigations will be conducted based on findings of previous investigations, compliance with distribution requirements, sampling results, complaints, and regional staff knowledge. Total estimated costs for the 14 FTEs would be $780,889 for the first year the proposed rules are in effect and $722,089 each year thereafter.

Additional costs include: RTCR Compliance Training Outreach Events at a cost of $75,000 in the first year; an increase in financial, managerial, and technical compliance support at $250,000 per year, and additional operator training for technical and regulatory compliance through the Texas Optimization Program which provides technical assistance, training, and optimization strategies for public water systems at approximately $150,000 per year. This totals to $475,000 the first year and $400,000 for each subsequent year.

The total agency costs to implement the proposed RTCR including FTEs, compliance training and outreach events are estimated to be $1,255,889 in the first year and $1,122,089 in subsequent years. The agency would fund any new costs from its Water Resources Account 0153.

Public Benefits and Costs

Mr. Horvath also determined that for each year of the first five years the proposed rules are in effect, the public benefit anticipated from the changes in the proposed rules would be compliance with federal law and the protection of public health by ensuring the integrity of public drinking water distribution systems through monitoring for the presence of microbial contamination.

Fiscal implications are anticipated for businesses and individuals as a result of the administration and enforcement of the proposed rules, particularly for those businesses or individuals that own or operate a public water system.

The proposed rules would impact approximately 3,706 businesses that own or operate public water systems. In particular, public water systems will be affected by the proposed changes that correspond with the RTCR.

Under the proposed rules, businesses that own public water systems will be required to revise their existing Sample Siting Plans for the collection of total coliform samples. These public water systems will also be required to conduct Level 1 and Level 2 assessments of their system if they trigger certain requirements and will be required to conduct any corrective actions associated with those Level 1 and Level 2 assessments. Corrective actions associated with Level 1 and Level 2 assessments could range from minor to major activities associated with maintenance, treatment, and distribution system infrastructure improvements. Finally, if applicable, they will be required to perform seasonal start-up procedures and provide certification to the executive director that the required seasonal start-up activities have been completed.

Costs to perform these activities are difficult to estimate and would vary due to the difference and variability in size, type, and configuration of each public water system's distribution system. The additional activities may require businesses that own public water systems to hire consultants to develop: 1) Sample Siting Plan revisions; 2) Level 1 or Level 2 assessments; 3) corrective actions; or 4) seasonal start-up procedures. Costs associated with Level 1 and Level 2 assessments could be significant for activities concerning maintenance, treatment, and distribution system infrastructure

improvements. The EPA has indicated that the overall net increase in costs for most of the public water systems serving greater than 4,100 people will be driven primarily by the requirements to conduct assessments and to conduct necessary corrective actions when sanitary defects are identified. Public water systems will be required to update their water distribution map to include the location of microbial sampling sites, water main sizes, entry point source locations, water storage facilities, any pressure plane boundaries, and include their water distribution map with their Sample Siting Plan.

Public water systems may also realize a cost savings due to the proposed conformity with federal rules as they concern public notice requirements. Specifically, public water systems would not be required to issue a Tier 1 public notice using two of the approved methods, but instead would be allowed to issue a Tier 1 public notice using one or more of the approved methods. In addition, public water systems would not be required to issue a Tier 3 public notice within three months and would be allowed to issue a Tier 3 public notice on an annual basis.

Minor cost savings may be expected for those public water systems allowed to issue public notice to customers for certain violations on an annual basis rather than within 90 days. Community public water systems will be allowed to issue required notices in their annual CCR, and all other public water systems will be required to issue notices by posting or other means. Cost savings will vary due to the differences in size and type of the public water system.

Under the proposed agency rules separate from the RTCR rules, public water systems may be required to issue boil water notices to customers at the discretion of the executive director in addition to pre-existing requirements. Public water systems will also be required to provide boil water rescind notifications to customers. These requirements are not expected to result in significant fiscal implications for public water systems.

Businesses or individuals may see their water rates increase due to the increased costs for public water system activities associated with compliance with this rulemaking. Overall, rate increases are not anticipated to be significant.

Small Business and Micro-Business Assessment

Adverse fiscal implications are anticipated for small or micro-businesses as a result of the proposed rules. There are approximately 3,600 small businesses and approximately 1,000 micro-businesses that are public water systems and may be affected by the proposed rules.

Costs will generally be the same for small water systems as they are for larger ones. However, smaller public water systems will not be required to collect as many samples as larger public water systems and will generally have less complex Sample Siting Plans and less complex distribution systems, decreasing the time to conduct Level 1 and Level 2 assessments and address any subsequent corrective actions. Smaller seasonal public water systems may have less time involved in conducting start-up activities. EPA estimates that transient, noncommunity public water systems serving 100 or fewer

people will experience the largest increase as a result of this rulemaking. These systems are estimated to incur a net annualized present value increase of approximately $86 per system under the RTCR.

Small Business Regulatory Flexibility Analysis

The commission reviewed this proposed rulemaking and determined that a small business regulatory flexibility analysis is not required because the proposed rulemaking is necessary in order to comply with federal law and is, therefore, consistent with protecting the health, safety, or environmental and economic welfare of the state.

Local Employment Impact Statement

The commission reviewed this proposed rulemaking and determined that a local employment impact statement is not required because the proposed rulemaking does not adversely affect a local economy in a material way for the first five years that the proposed rulemaking is in effect.

Draft Regulatory Impact Analysis Determination

The commission reviewed the proposed rulemaking in light of the regulatory analysis requirements of Texas Government Code, §2001.0225 and determined that the rulemaking is not subject to Texas Government Code, §2001.0225. A "major environmental rule" means a rule with a specific intent to protect the environment or reduce risks to human health from environmental exposure, and that may adversely affect in a material way the economy, a sector of the economy, productivity, competition,

jobs, the environment, or the public health and safety of the state or a sector of the state.

First, the proposed rulemaking does not meet the statutory definition of a "major environmental rule" because its specific intent is not to protect the environment or reduce risks to human health from environmental exposure. The specific intent of the proposed rulemaking is to incorporate changes in the federal drinking water regulations in order to maintain the state's primary enforcement responsibility with regard to drinking water. This is accomplished by enacting state rules no less stringent than the federal regulations and adopting adequate procedures for implementation and enforcement of these rules, while providing alternative approaches to compliance based in part on stakeholder input and taking into account special considerations related to the state's particular source water conditions. The federal regulations in the RTCR that would be implemented through the proposed rulemaking are designed to increase public human health protection through the reduction of potential pathways of entry for fecal contamination into the distribution systems of public drinking water systems, which should reduce the potential risk from all waterborne pathogens including bacteria, viruses, parasitic protozoa, and their associated illnesses. In addition, the proposed rulemaking addresses specific comments from the EPA regarding state implementation of the GWR, ensuring that the state rules are no less stringent than the GWR. Finally, the proposed rulemaking clarifies state implantation of the Lead and Copper Rule, the Total Organic Carbon Rule, and incorporate other federal analytical and reporting requirements for public drinking water systems.

Second, the proposed rulemaking does not meet the statutory definition of a "major environmental rule" because the proposed rules would not adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. It is not anticipated that the cost of complying with the proposed rules will be significant with respect to the economy as a whole or with respect to a sector of the economy; therefore, the proposed amendments will not adversely affect in a material way the economy, a sector of the economy, competition, or jobs.

Finally, the proposed rulemaking does not meet any of the four applicability requirements for a "major environmental rule" listed in Texas Government Code, §2001.0225(a). Texas Government Code, §2001.0225 only applies to a major environmental rule, the result of which is to: 1) exceed a standard set by federal law, unless the rule is specifically required by state law; 2) exceed an express requirement of state law, unless the rule is specifically required by federal law; 3) exceed a requirement of a delegation agreement or contract between the state and an agency or representative of the federal government to implement a state and federal program; or 4) adopt a rule solely under the general powers of the agency instead of under a specific state law. This proposed rulemaking does not meet any of the preceding four applicability requirements because this rulemaking: does not exceed any standard set by federal law for public water systems and is proposed to be consistent with and no less stringent than federal rules; does not exceed any express requirement of state law under THSC, Chapter 341, Subchapter C; does not exceed a requirement of a delegation agreement or contract

between the state and an agency or representative of the federal government, but rather is proposed to be consistent with applicable federal rules in order to allow the state to maintain its authority to implement the federal Safe Drinking Water Act, pursuant to agreements between the commission and the EPA; and is not proposed solely under the general powers of the agency, but specifically under THSC, §341.031, which allows the commission to adopt and enforce rules to implement the federal Safe Drinking Water Act, as well as the other general powers of the commission.

The commission invites public comment regarding this Draft Regulatory Impact Analysis Determination. Written comments on the Draft Regulatory Impact Analysis Determination may be submitted to the contact person at the address listed under the Submittal of Comments section of this preamble.

Takings Impact Assessment

The commission evaluated this proposed rulemaking and performed a preliminary assessment of whether these proposed rules constitute a taking under Texas Government Code, Chapter 2007.

The commission proposes these rules for the specific purpose of maintaining the state's primary enforcement responsibility by incorporating federal drinking water regulations related to: 1) increasing public health protection through the reduction of potential pathways of entry for fecal contaminants into distribution systems of public drinking water systems in response to the RTCR, published by the EPA in the February 13, 2013,

issue of the *Federal Register*; and 2) responding to comments from the EPA on state implementation of the GWR to ensure that the state rules are no less stringent than the federal. The proposed rules also clarify state rules governing lead and copper, TOC, and other state drinking water analytical and reporting requirements governed by federal requirements and/or addressed in federal guidance documents. In addition, the proposed rules clarify requirements for special precautions, protective measures, boil water notices, and special investigation requirements for elevated turbidity levels and for failure to provide compliance data. Finally, the proposed rules correct typographical errors, formatting, internal cross-references, and citation changes.

The commission's analysis indicates that Texas Government Code, Chapter 2007, does not apply to these proposed rules based upon exceptions to applicability in Texas Government Code, §2007.003(b). First, the proposed rulemaking is an action that is reasonably taken to fulfill an obligation mandated by federal law, Texas Government Code, §2007.003(b)(4). In order to maintain primacy over public drinking water, the state shall enact rules no less stringent than the federal drinking water regulations as required by 40 CFR §142.10. Second, the proposed rulemaking is an action that is taken in response to a real and substantial threat to public health and safety; that is designed to significantly advance the public health and safety purpose; and that does not impose a greater burden than is necessary to achieve the public health and safety purpose, Texas Government Code. §2007.003(b)(13). Though health and safety purpose is incidental to the rulemaking's goal of maintaining state primacy over drinking water regulation, fecal contamination in the distribution systems of public drinking water systems constitutes a

real and substantial threat to public health and safety and requires appropriate governmental regulation. Reducing potential pathways for fecal contamination in drinking water distribution systems should reduce the potential risk from all waterborne pathogens including bacteria, viruses, parasitic protozoa, and their associated illnesses. The proposed rules significantly advance the public health and safety purpose by ensuring appropriate governmental regulation of these items, and do so in a way that does not impose a greater burden than is necessary to achieve the public health and safety purpose.

Further, the commission determined that promulgation and enforcement of these proposed rules would be neither a statutory nor a constitutional taking of private real property. Specifically, there are no burdens imposed on private real property under the rule because the proposed rules neither relate to, nor have any impact on, the use or enjoyment of private real property, and there would be no reduction in property value as a result of these rules. The rules require public water systems to comply with drinking water standards protective of human health and the environment, and the rules bring those standards into concurrence with the corresponding federal regulations. Therefore, the proposed rules would not constitute a taking under Texas Government Code, Chapter 2007.

Consistency with the Coastal Management Program

The commission reviewed the proposed rules and found that they are neither identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11(b)(2) or (4), nor will

they affect any action/authorization identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11(a)(6). Therefore, the proposed rules are not subject to the Texas Coastal Management Program.

Written comments on the consistency of this rulemaking may be submitted to the contact person at the address listed under the Submittal of Comments section of this preamble.

Announcement of Hearing

The commission will hold a public hearing on this proposal in Austin on November 1, 2016, at 2:00 p.m., in Austin, at the commission's central office located at 12100 Park 35 Circle. The hearing is structured for the receipt of oral or written comments by interested persons. Individuals may present oral statements when called upon in order of registration. Open discussion will not be permitted during the hearing; however, commission staff members will be available to discuss the proposal 30 minutes prior to the hearing.

Persons who have special communication or other accommodation needs who are planning to attend the hearing should contact Sandy Wong, Office of Legal Services at (512) 239-1802 or 1-800-RELAY-TX (TDD). Requests should be made as far in advance as possible.

Submittal of Comments

Written comments may be submitted to Sherry Davis, MC 205, Office of Legal Services,

Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087, or faxed to (512) 239-4808. Electronic comments may be submitted at: *http://www1.tceq.texas.gov/rules/ecomments/*. File size restrictions may apply to comments being submitted via the eComments system. All comments should reference Rule Project Number 2015-035-290-OW. The comment period closes on November 7, 2016. Copies of the proposed rulemaking can be obtained from the commission's website at *http://www.tceq.texas.gov/rules/propose_adopt.html*. For further information, please contact James Beauchamp, Office of Water, (512) 239-6174.

SUBCHAPTER D: RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS

§§290.38, 290.42, 290.46, 290.47

Statutory Authority

These amendments are proposed under the Texas Water Code (TWC), §5.102, which establishes the commission's general authority necessary to carry out its jurisdiction; TWC, §5.103, which establishes the commission's general authority to adopt rules; TWC, §5.105, which establishes the commission's authority to set policy by rule; Texas Health and Safety Code (THSC), §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 United States Code, §§300f - 300j-26; and THSC, §341.0315, which requires public water systems to comply with commission rules adopted to ensure the supply of safe drinking water.

§290.38. Definitions.

The following words and terms, when used in this chapter shall have the following meanings, unless the context clearly indicates otherwise. If a word or term used in this chapter is not contained in the following list, its definition shall be as shown in 40 Code of Federal Regulations (CFR) §141.2. Other technical terms used shall have the meanings or definitions listed in the latest edition of *The Water Dictionary: A Comprehensive Reference of Water Terminology*, prepared by the American Water Works Association.

(1) Affected utility--A retail public utility (§291.3 of this title (relating to Definitions of Terms)), exempt utility (§291.103(d)(1) of this title (relating to Certificates Not Required)), or provider or conveyor of potable or raw water service that furnishes water service to more than one customer:

(A) in a county with a population of 3.3 million or more; or

(B) in a county with a population of 550,000 or more adjacent to a county with a population of 3.3 million or more.

(2) Air gap--The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying water to a tank, fixture, receptor, sink, or other assembly and the flood level rim of the receptacle. The vertical, physical separation must be at least twice the diameter of the water supply outlet, but never less than 1.0 inch.

(3) American National Standards Institute (ANSI) standards--The standards of the American National Standards Institute, Inc.

(4) American Society of Mechanical Engineers (ASME) standards--The standards of the ASME.

(5) American Water Works Association (AWWA) standards--The latest edition of the applicable standards as approved and published by the AWWA.

(6) Approved laboratory--A laboratory approved by the executive director to analyze water samples to determine their compliance with certain maximum or minimum allowable constituent levels.

(7) ASTM International standards--The standards of ASTM International (formerly known as the American Society for Testing and Materials).

(8) Auxiliary power--Either mechanical power or electric generators which can enable the system to provide water under pressure to the distribution system in the event of a local power failure. With the approval of the executive director, dual primary electric service may be considered as auxiliary power in areas which are not subject to large scale power outages due to natural disasters.

(9) Bag filter--Pressure-driven separation device that removes particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed of a non-rigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to the outside.

(10) Baseline performance--In reference to a membrane treatment facility, the detailed assessment of observed operational conditions at the time the membrane

facility is placed in service for the purpose of tracking changes over time and determining when maintenance or service is required. Examples of parameters where baseline performance data is collected include: net driving pressure, normalized permeate flow, salt rejection, and salt passage.

(11) Cartridge filter--Pressure-driven separation device that removes particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed as rigid or semi-rigid, self-supporting filter elements housed in pressure vessels in which flow is from the outside of the cartridge to the inside.

(12) Certified laboratory--A laboratory certified by the commission to analyze water samples to determine their compliance with maximum allowable constituent levels. After June 30, 2008, laboratories must be accredited, not certified, in order to perform sample analyses previously performed by certified laboratories.

(13) Challenge test--A study conducted to determine the removal efficiency (log removal value) of a device for a particular organism, particulate, or surrogate.

(14) Chemical disinfectant--Any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, and ozone added to the water in any part of the treatment or distribution process, that is intended to kill or inactivate pathogenic microorganisms.

(15) Community water system--A public water system which has a potential to serve at least 15 residential service connections on a year-round basis or serves at least 25 residents on a year-round basis.

(16) Connection--A single family residential unit or each commercial or industrial establishment to which drinking water is supplied from the system. As an example, the number of service connections in an apartment complex would be equal to the number of individual apartment units. When enough data is not available to accurately determine the number of connections to be served or being served, the population served divided by three will be used as the number of connections for calculating system capacity requirements. Conversely, if only the number of connections is known, the connection total multiplied by three will be the number used for population served. For the purposes of this definition, a dwelling or business which is connected to a system that delivers water by a constructed conveyance other than a pipe shall not be considered a connection if:

(A) the water is used exclusively for purposes other than those defined as human consumption (see human consumption);

(B) the executive director determines that alternative water to achieve the equivalent level of public health protection provided by the drinking water standards

is provided for residential or similar human consumption, including, but not limited to, drinking and cooking; or

(C) the executive director determines that the water provided for residential or similar human consumption is centrally treated or is treated at the point of entry by a provider, a pass through entity, or the user to achieve the equivalent level of protection provided by the drinking water standards.

(17) Contamination--The presence of any foreign substance (organic, inorganic, radiological, or biological) in water which tends to degrade its quality so as to constitute a health hazard or impair the usefulness of the water.

(18) Cross-connection--A physical connection between a public water system and either another supply of unknown or questionable quality, any source which may contain contaminating or polluting substances, or any source of water treated to a lesser degree in the treatment process.

(19) Direct integrity test--A physical test applied to a membrane unit in order to identify and isolate integrity breaches/leaks that could result in contamination of the filtrate.

(20) Disinfectant--A chemical or a treatment which is intended to kill or inactivate pathogenic microorganisms in water.

(21) Disinfection--A process which inactivates pathogenic organisms in the water by chemical oxidants or equivalent agents.

(22) Distribution system--A system of pipes that conveys potable water from a treatment plant to the consumers. The term includes pump stations, ground and elevated storage tanks, potable water mains, and potable water service lines and all associated valves, fittings, and meters, but excludes potable water customer service lines.

(23) Drinking water--All water distributed by any agency or individual, public or private, for the purpose of human consumption or which may be used in the preparation of foods or beverages or for the cleaning of any utensil or article used in the course of preparation or consumption of food or beverages for human beings. The term "drinking water" ["Drinking Water"] shall also include all water supplied for human consumption or used by any institution catering to the public.

(24) Drinking water standards--The commission rules covering drinking water standards in Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems).

(25) Elevated storage capacity--That portion of water which can be stored at least 80 feet above the highest service connection in the pressure plane served by the storage tank.

(26) Emergency operations--The operation of an affected utility during an extended power outage at a minimum water pressure of 35 pounds per square inch.

(27) Emergency power--Either mechanical power or electric generators which can enable the system to provide water under pressure to the distribution system in the event of a local power failure. With the approval of the executive director, dual primary electric service may be considered as emergency power in areas which are not subject to large scale power outages due to natural disasters.

(28) Extended power outage--A power outage lasting for more than 24 hours.

(29) Filtrate--The water produced from a filtration process; typically used to describe the water produced by filter processes such as membranes.

(30) Flux--The throughput of a pressure-driven membrane filtration system expressed as flow per unit of membrane area. For example, gallons per square foot per day or liters per hour per square meter.

(31) Grantee--For purposes of this chapter, any person receiving an ownership interest in a public water system, whether by sale, transfer, descent, probate, or otherwise.

(32) Grantor--For purposes of this chapter, any person who conveys an ownership interest in a public water system, whether by sale, transfer, descent, probate, or otherwise.

(33) [(31)] Groundwater--Any water that is located beneath the surface of the ground and is not under the direct influence of surface water.

(34) [(32)] Groundwater under the direct influence of surface water--Any water beneath the surface of the ground with:

(A) significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia* or *Cryptosporidium*;

(B) significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions; or

(C) site-specific characteristics including measurements of water quality parameters, well construction details, existing geological attributes, and other features that are similar to groundwater sources that have been identified by the executive director as being under the direct influence of surface water.

(35) [(33)] Health hazard--A cross-connection, potential contamination hazard, or other situation involving any substance that can cause death, illness, spread of disease, or has a high probability of causing such effects if introduced into the potable drinking water supply.

(36) [(34)] Human consumption--Uses by humans in which water can be ingested into or absorbed by the human body. Examples of these uses include, but are not limited to drinking, cooking, brushing teeth, bathing, washing hands, washing dishes, and preparing foods.

(37) [(35)] Indirect integrity monitoring--The monitoring of some aspect of filtrate water quality, such as turbidity, that is indicative of the removal of particulate matter.

(38) [(36)] Innovative/alternate treatment--Any treatment process that does not have specific design requirements in §290.42(a) - (f) of this title (relating to Water Treatment).

(39) [(37)] Interconnection--A physical connection between two public water supply systems.

(40) [(38)] International Fire Code (IFC)--The standards of the International Code Council.

(41) [(39)] Intruder-resistant fence--A fence six feet or greater in height, constructed of wood, concrete, masonry, or metal with three strands of barbed wire extending outward from the top of the fence at a 45 degree angle with the smooth side of the fence on the outside wall. In lieu of the barbed wire, the fence must be eight feet in height. The fence must be in good repair and close enough to surface grade to prevent intruder passage.

(42) [(40)] L/d ratio--The dimensionless value that is obtained by dividing the length (depth) of a granular media filter bed by the weighted effective diameter "d" of the filter media. The weighted effective diameter of the media is calculated based on the percentage of the total bed depth contributed by each media layer.

(43) [(41)] Licensed professional engineer--An engineer who maintains a current license through the Texas Board of Professional Engineers in accordance with its requirements for professional practice.

(44) [(42)] Log removal value (LRV)--Removal efficiency for a target organism, particulate, or surrogate expressed as $\log_{10}$ (i.e., $\log_{10}$ (feed concentration) - $\log_{10}$ (filtrate concentration)).

(45) [(43)] Maximum daily demand--In the absence of verified historical data or in cases where a public water system has imposed mandatory water use restrictions

within the past 36 months, maximum daily demand means 2.4 times the average daily demand of the system.

(46) [(44)] Maximum contaminant level (MCL)--The MCL for a specific contaminant is defined in the section relating to that contaminant.

(47) [(45)] Membrane filtration--A pressure or vacuum driven separation process in which particulate matter larger than one micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test; includes the following common membrane classifications microfiltration (MF), ultrafiltration (UF), nanofiltration (NF), and reverse osmosis (RO), as well as any "membrane cartridge filtration" (MCF) device that satisfies this definition.

(48) [(46)] Membrane LRVC-Test --The number that reflects the removal efficiency of the membrane filtration process demonstrated during challenge testing. The value is based on the entire set of log removal values (LRVs) obtained during challenge testing, with one representative LRV established per module tested.

(49) [(47)] Membrane module--The smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.

(50) [(48)] Membrane sensitivity--The maximum log removal value that can be reliably verified by a direct integrity test.

(51) [(49)] Membrane unit--A group of membrane modules that share common valving, which allows the unit to be isolated from the rest of the system for the purpose of integrity testing or other maintenance.

(52) [(50)] Milligrams per liter (mg/L)--A measure of concentration, equivalent to and replacing parts per million in the case of dilute solutions.

(53) [(51)] Monthly reports of water works operations--The daily record of data relating to the operation of the system facilities compiled in a monthly report.

(54) [(52)] National Fire Protection Association (NFPA) standards--The standards of the NFPA.

(55) [(53)] NSF International--The organization and the standards, certifications, and listings developed by NSF International (formerly known as the National Sanitation Foundation) related to drinking water.

(56) [(54)] Noncommunity water system--Any public water system which is not a community system.

(57) [(55)] Nonhealth hazard--A cross-connection, potential contamination hazard, or other situation involving any substance that generally will not be a health hazard, but will constitute a nuisance, or be aesthetically objectionable, if introduced into the public water supply.

(58) [(56)] Nontransient, noncommunity water system--A public water system that is not a community water system and regularly serves at least 25 of the same persons at least six months out of the year.

(59) [(57)] Pass--In reference to a reverse osmosis or nanofiltration membrane system, stages of pressure vessels in series in which the permeate from one stage is further processed in a following stage.

(60) [(58)] Peak hourly demand--In the absence of verified historical data, peak hourly demand means 1.25 times the maximum daily demand (prorated to an hourly rate) if a public water supply meets the commission's minimum requirements for elevated storage capacity and 1.85 times the maximum daily demand (prorated to an hourly rate) if the system uses pressure tanks or fails to meet the commission's minimum elevated storage capacity requirement.

(61) [(59)] Plumbing inspector--Any person employed by a political subdivision for the purpose of inspecting plumbing work and installations in connection with health and safety laws and ordinances, who has no financial or advisory interest in

any plumbing company, and who has successfully fulfilled the examinations and requirements of the Texas State Board of Plumbing Examiners.

(62) [(60)] Plumbing ordinance--A set of rules governing plumbing practices which is at least as stringent and comprehensive as one of the following nationally recognized codes:

(A) the International Plumbing Code; or

(B) the Uniform Plumbing Code.

(63) [(61)] Potable water customer service line--The sections of potable water pipe between the customer's meter and the customer's point of use.

(64) [(62)] Potable water service line--The section of pipe between the potable water main and [to] the customer's side of the water meter. In cases where no customer water meter exists, it is the section of pipe that is under the ownership and control of the public water system.

(65) [(63)] Potable water main--A pipe or enclosed constructed conveyance operated by a public water system which is used for the transmission or distribution of drinking water to a potable water service line.

(66) [(64)] Potential contamination hazard--A condition which, by its location, piping or configuration, has a reasonable probability of being used incorrectly, through carelessness, ignorance, or negligence, to create or cause to be created a backflow condition by which contamination can be introduced into the water supply. Examples of potential contamination hazards are:

(A) bypass arrangements;

(B) jumper connections;

(C) removable sections or spools; and

(D) swivel or changeover assemblies.

(67) [(65)] Process control duties--Activities that directly affect the potability of public drinking water, including: making decisions regarding the day-to-day operations and maintenance of public water system production and distribution; maintaining system pressures; determining the adequacy of disinfection and disinfection procedures; taking routine microbiological samples; taking chlorine residuals and microbiological samples after repairs or installation of lines or appurtenances; and operating chemical feed systems, filtration, disinfection, or pressure maintenance equipment; or performing other duties approved by the executive director.

(68) [(66)] psi--Pounds per square inch.

(69) [(67)] Public drinking water program--Agency staff designated by the executive director to administer the Safe Drinking Water Act and state statutes related to the regulation of public drinking water. Any report required to be submitted in this chapter to the executive director must be submitted to the Texas Commission on Environmental Quality, Water Supply Division, MC 155, P.O. Box 13087, Austin, Texas 78711-3087.

(70) [(68)] Public health engineering practices--Requirements in this chapter [subchapter] or guidelines promulgated by the executive director.

(71) [(69)] Public water system--A system for the provision to the public of water for human consumption through pipes or other constructed conveyances, which includes all uses described under the definition for drinking water. Such a system must have at least 15 service connections or serve at least 25 individuals at least 60 days out of the year. This term includes: any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used primarily in connection with such system, and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Two or more systems with each having a potential to serve less than 15 connections or less than 25 individuals but owned by the same person, firm, or corporation and located on adjacent land will be considered a public water system when the total potential service connections in the

combined systems are 15 or greater or if the total number of individuals served by the combined systems total 25 or greater at least 60 days out of the year. Without excluding other meanings of the terms "individual" or "served," an individual shall be deemed to be served by a water system if he lives in, uses as his place of employment, or works in a place to which drinking water is supplied from the system.

(72) [(70)] Quality Control Release Value (QCRV)--A minimum quality standard of a non-destructive performance test established by the manufacturer for membrane module production that ensures that the module will attain the targeted log removal value demonstrated during challenge testing.

(73) [(71)] Reactor Validation Testing--A process by which a full-scale ultraviolet (UV) reactor's disinfection performance is determined relative to operating parameters that can be monitored. These parameters include flow rate, UV intensity as measured by a UV sensor and the UV lamp status.

(74) [(72)] Resolution--The size of the smallest integrity breach that contributes to a response from a direct integrity test in membranes used to treat surface water or groundwater under the direct influence of surface water.

(75) [(73)] Sanitary control easement--A legally binding document securing all land, within 150 feet of a public water supply well location, from pollution hazards. This document must fully describe the location of the well and surrounding lands and

must be filed in the county records to be legally binding. For an example, see commission Form 20698.

(76) [(74)] Sanitary survey--An onsite review of a public water system's adequacy for producing and distributing safe drinking water by evaluating the following elements: water source; treatment; distribution system; finished water storage; pump, pump facilities, and controls; monitoring, reporting, and data verification; system management, operation and maintenance; and operator compliance.

(77) [(75)] Sensitivity--The maximum log removal value (LRV) that can be reliably verified by a direct integrity test in membranes used to treat surface water or groundwater under the direct influence of surface water; also applies to some continuous indirect integrity monitoring methods.

(78) [(76)] Service line--A pipe connecting the utility service provider's main and the water meter, or for wastewater, connecting the main and the point at which the customer's service line is connected, generally at the customer's property line.

(79) [(77)] Service pump--Any pump that takes treated water from storage and discharges to the distribution system.

(80) [(78)] Significant deficiency--Significant deficiencies cause, or have the potential to cause, the introduction of contamination into water delivered to customers.

This may include defects in design, operation, or maintenance of the source, treatment, storage, or distribution systems.

(81) [(79)] Stage--In reference to a reverse osmosis or nanofiltration membrane system, a set of pressure vessels installed in parallel.

(82) System--Public water system as defined in this section unless otherwise modified (i.e., distribution system).

(83) [(80)] Transfer pump--Any pump which conveys water from one point to another within the treatment process or which conveys water to storage facilities prior to distribution.

(84) [(81)] Transient, noncommunity water system--A public water system that is not a community water system and serves at least 25 persons at least 60 days out of the year, yet by its characteristics, does not meet the definition of a nontransient, noncommunity water system.

(85) [(82)] Vessel--In reference to a reverse osmosis or nanofiltration membrane system, a cylindrical housing unit where membrane modules are placed in a series to form one unit.

(86) [(83)] Wastewater lateral--Any pipe or constructed conveyance carrying wastewater, running laterally down a street, alley, or easement, and receiving flow only from the abutting properties.

(87) [(84)] Wastewater main--Any pipe or constructed conveyance which receives flow from one or more wastewater laterals.

(88) Water system--Public water system as defined in this section unless otherwise modified (i.e., distribution system).

§290.42. Water Treatment.

(a) Capacity and location.

(1) Based on current acceptable design standards, the total capacity of the public water system's treatment facilities must always be greater than its anticipated maximum daily demand.

(2) The water treatment plant and all pumping units shall be located in well-drained areas not subject to flooding and away from seepage areas or where the groundwater water table is near the surface.

(A) Water treatment plants shall not be located within 500 feet of a sewage treatment plant or lands irrigated with sewage effluent. A minimum distance of 150 feet must be maintained between any septic tank drainfield line and any underground treatment or storage unit. Any sanitary sewers located within 50 feet of any underground treatment or storage unit shall be constructed of ductile iron or polyvinyl chloride (PVC) pipe with a minimum pressure rating of 150 pounds per square inch (psi) and have watertight joints.

(B) Plant site selection shall also take into consideration the need for disposition of all plant wastes in accordance with all applicable regulations and state statutes, including both liquid and solid wastes, or by-product material from operation and/or maintenance.

(3) Each water treatment plant shall be located at a site that is accessible by an all-weather road.

(b) Groundwater.

(1) Disinfection facilities shall be provided for all groundwater supplies for the purpose of microbiological control and distribution protection and shall be in conformity with applicable disinfection requirements in subsection (e) of this section <u>and in a manner consistent with the requirements of §290.110 of this title (relating to Disinfectant Residuals)</u>.

(2) Treatment facilities shall be provided for groundwater if the water does not meet the drinking water standards. The facilities provided shall be in conformance with established and proven methods.

(A) Filters provided for turbidity and microbiological quality control shall be preceded by coagulant addition and shall conform to the requirements of subsection (d)(11) of this section. Filtration rates for iron and manganese removal, regardless of the media or type of filter, shall be based on a maximum rate of five gallons per minute per square foot (gpm/sq ft).

(B) The removal of iron and manganese may not be required if it can be demonstrated that these metals can be sequestered so that the discoloration problems they cause do not exist in the distribution system.

(C) All processes involving exposure of the water to atmospheric contamination shall provide for subsequent disinfection of the water ahead of ground storage tanks. Likewise, all exposure of water to atmospheric contamination shall be accomplished in a manner such that insects, birds, and other foreign materials will be excluded from the water. Aerators and all other such openings shall be screened with 16-mesh or finer corrosion-resistant screen.

(D) If reverse osmosis or nanofiltration membrane systems are used, the design shall conform to the requirements in paragraph (9) of this subsection.

(3) Any proposed change in the extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination, and on qualitative and quantitative microbiological and chemical analyses.

(4) Appropriate laboratory facilities shall be provided for controls as well as to check the effectiveness of disinfection or any other treatment processes employed.

(5) All plant piping shall be constructed to minimize leakage.

(6) All groundwater systems shall provide sampling taps for raw water, treated water, and at a point representing water entering the distribution system at every entry point.

(7) Air release devices shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer corrosion-resistant screening material or an equivalent acceptable to the executive director.

(8) The executive director may require 4-log removal or inactivation of viruses based on raw water sampling results required by §290.116 of this title (relating to Groundwater Corrective Actions and Treatment Techniques).

(9) Reverse osmosis or nanofiltration membrane systems used for the treatment of primary and secondary contaminants defined in Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems), must meet the design criteria in subparagraphs (A) - (L) of this paragraph.

(A) The design for all reverse osmosis and nanofiltration membrane systems must be in accordance with the findings of the engineering report. Variations from the engineering report must be explained and shall not compromise public health. Minimum engineering report requirements are found in §290.39(e)(1) and (6) of this title (relating to General Provisions).

(B) The reverse osmosis and nanofiltration membrane systems must be designed to ensure adequate cleaning of the membrane system.

(C) The reverse osmosis or nanofiltration membrane systems must be designed to operate at flux rates which assure effective filtration at all times based on at least one of the following:

(i) manufacturer's computer models for new and end-of-life membranes;

(ii) site-specific pilot study;

(iii) comparable design data from an alternative site; or

(iv) the manufacturer's allowable operating parameters, if the membrane unit's capacity is rated less than 300 gallons per minute [(gpm)].

(D) Pretreatment shall be provided such that the feed water quality to the membrane units shall meet the minimum allowable requirements of the membrane manufacturer. Pretreatment processes shall be sized correctly for the flow of the plant, and the components and chemicals used for pretreatment in contact with the water must conform to American National Standards Institute/NSF International (ANSI/NSF) Standard 60 for Drinking Water Treatment Chemicals or ANSI/NSF Standard 61 for Drinking Water System Components. Other pretreatment processes will be reviewed on an individual basis in accordance the innovative/alternate treatment requirements specified in subsection (g) of this section. Acceptable pretreatment techniques include:

(i) bags, cartridge filters, or screens for particulate removal;

(ii) chemical addition that will not adversely affect the reverse osmosis or nanofiltration membrane;

(iii) filters for iron and manganese removal in accordance with paragraph (2)(A) of this subsection;

(iv) aeration or degasification; and

(v) ion exchange softening.

(E) The treatment plant must include post-treatment facilities for corrosivity control, re-mineralization and the removal of dissolved gases, such as carbon dioxide and hydrogen sulfide, if necessary to meet the system's water quality goals. The treatment must be sized correctly for the flow of the plant, and the components and chemicals used for treatment must conform to ANSI/NSF Standard 60 for Drinking Water Treatment Chemicals or ANSI/NSF Standard 61 for Drinking Water System Components.

(F) Pipes and pipe galleries shall meet the minimum requirements specified in subsection (d)(12) and (13) of this section.

(G) Each reverse osmosis or nanofiltration membrane unit shall be equipped to measure conductivity or total dissolved solids in the feed and the permeate water.

(H) Chemical storage and chemical feed facilities shall comply with subsection (f) of this section.

(I) Provide cross-connection protection for common piping used for cleaning and normal production modes.

(J) Provide flow meters on the pipes for feed, permeate, and concentrate water. Additional metering devices shall be provided as appropriate to monitor the flow rate through specific treatment processes. Metering devices shall be located to facilitate use and to assist in the determination of chemical dosages, the accumulation of water production data, and the operation of plant facilities.

(K) The water system must provide pressure measuring and recording devices before and after each membrane stage.

(L) The water system must provide equipment to monitor the temperature of the water. The temperature of the water must be measured using a thermometer or thermocouple with a minimum accuracy of plus or minus 0.5 degrees Celsius.

(c) Springs and other water sources.

(1) Water obtained from springs, infiltration galleries, wells in fissured areas, wells in carbonate rock formations, or wells that do not penetrate impermeable strata or any other source subject to surface or near surface contamination of recent

origin shall be evaluated for the provision of treatment facilities. Minimum treatment shall consist of coagulation with direct filtration and adequate disinfection. In all cases, the treatment process shall be designed to achieve at least a 2-log removal of *Cryptosporidium* oocysts, a 3-log removal or inactivation of *Giardia* cysts, and a 4-log removal or inactivation of viruses before the water is supplied to any consumer. The executive director may require additional levels of treatment in cases of poor source water quality. Based on raw water monitoring results, the executive director may require additional levels of treatment for *Cryptosporidium* treatment as specified in §290.111 of this title (relating to Surface Water Treatment).

(A) Filters provided for turbidity and microbiological quality control shall conform to the requirements of subsection (d)(11) of this section.

(B) All processes involving exposure of the water to atmospheric contamination shall provide for subsequent disinfection of the water ahead of ground storage tanks. Likewise, all exposure of water to atmospheric contamination shall be accomplished in a manner such that insects, birds, and other foreign materials will be excluded from the water. Aerators and all other such openings shall be screened with 16-mesh or finer corrosion-resistant screen.

(2) Any proposed change in the extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination, and qualitative and quantitative microbiological and chemical analyses.

(3) Appropriate laboratory facilities shall be provided for controls as well as for checking the effectiveness of disinfection or any other treatment processes employed.

(4) All plant piping shall be constructed to minimize leakage. No cross-connection or interconnection shall be permitted to exist between a conduit carrying potable water and another conduit carrying raw water or water in a prior stage of treatment.

(5) All systems using springs and other water sources shall provide sampling taps for raw water, treated water, and at a point representing water entering the distribution system at every entry point.

(6) Return of the decanted water or sludge to the treatment process shall be adequately controlled so that there will be a minimum of interference with the treatment process and shall conform to the applicable requirements of subsection (d)(3) of this section. Systems that do not comply with the provisions of subsection (d)(3) of this section commit a treatment technique violation and must notify their customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(7) Air release devices on treated waterlines shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of

contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer corrosion-resistant screening material or an equivalent acceptable to the executive director.

(8) Reverse osmosis and nanofiltration membrane systems not provided for microbiological quality control shall conform to the requirements of subsection (b) of this section.

(d) Surface water.

(1) All water secured from surface sources shall be given complete treatment at a plant which provides facilities for pretreatment disinfection, taste and odor control, continuous coagulation, sedimentation, filtration, covered clearwell storage, and terminal disinfection of the water with chlorine or suitable chlorine compounds. In all cases, the treatment process shall be designed to achieve at least a 2-log removal of *Cryptosporidium* oocysts, a 3-log removal or inactivation of *Giardia* cysts, and a 4-log removal or inactivation of viruses before the water is supplied to any consumer. The executive director may require additional levels of treatment in cases of poor source water quality. Based on raw water monitoring results, the executive director may require additional levels of treatment for *Cryptosporidium* treatment as specified in §290.111 of this title.

(2) All plant piping shall be constructed so as to be thoroughly tight against leakage. No cross-connection or interconnection shall be permitted to exist in a filtration plant between a conduit carrying filtered or post-chlorinated water and another conduit carrying raw water or water in any prior stage of treatment.

(A) Vacuum breakers must be provided on each hose bibb within the plant facility.

(B) No conduit or basin containing raw water or any water in a prior stage of treatment shall be located directly above, or be permitted to have a single common partition wall with another conduit or basin containing finished water.

(C) Make-up water supply lines to chemical feeder solution mixing chambers shall be provided with an air gap or other acceptable backflow prevention device.

(D) Filters shall be located so that common walls will not exist between them and aerators, mixing and sedimentation basins or clearwells. This rule is not strictly applicable, however, to partitions open to view and readily accessible for inspection and repair.

(E) Filter-to-waste connections, if included, shall be provided with an air gap connection to waste.

(F) Air release devices on treated waterlines shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer corrosion-resistant screening material or an equivalent acceptable to the executive director.

(3) Return of the decanted water or solids to the treatment process shall be adequately controlled so that there will be a minimum of interference with the treatment process. Systems that do not comply with the provisions of this paragraph commit a treatment technique violation and must notify their customers in accordance with the requirements of §290.122(b) of this title.

(A) Unless the executive director has approved an alternate recycling location, spent backwash water and the liquids from sludge settling lagoons, spent backwash water tanks, sludge thickeners, and similar dewatering facilities shall be returned to the raw waterline upstream of the raw water sample tap and coagulant feed point. The blended recycled liquids shall pass through all of the major unit processes at the plant.

(B) Recycle facilities shall be designed to minimize the magnitude and impact of hydraulic surges that occur during the recycling process.

(C) Solids produced by dewatering facilities such as sludge lagoons, sludge thickeners, centrifuges, mechanical presses, and similar devices shall not be returned to the treatment plant without the prior approval of the executive director.

(4) Reservoirs for pretreatment or selective quality control shall be provided where complete treatment facilities fail to operate satisfactorily at times of maximum turbidities or other abnormal raw water quality conditions exist. Recreational activities at such reservoirs shall be prohibited.

(5) Flow-measuring devices shall be provided to measure the raw water supplied to the plant, the recycled decant water, the treated water used to backwash the filters, and the treated water discharged from the plant. Additional metering devices shall be provided as appropriate to monitor the flow rate through specific treatment processes. Metering devices shall be located to facilitate use and to assist in the determination of chemical dosages, the accumulation of water production data, and the operation of plant facilities.

(6) Chemical storage facilities shall comply with applicable requirements in subsection (f)(1) of this section.

(7) Chemical feed facilities shall comply with the applicable requirements in subsection (f)(2) of this section.

(8) Flash mixing equipment shall be provided.

(A) Plants with a design capacity greater than 3.0 million gallons per day (MGD) must provide at least one hydraulic mixing unit or at least two sets of mechanical flash mixing equipment designed to operate in parallel. Public water systems with other surface water treatment plants, interconnections with other systems, or wells that can meet the system's average daily demand are exempt from the requirement for redundant mechanical flash mixing equipment.

(B) Flash mixing equipment shall have sufficient flexibility to ensure adequate dispersion and mixing of coagulants and other chemicals under varying raw water characteristics and raw water flow rates.

(9) Flocculation equipment shall be provided.

(A) Plants with a design capacity greater than 3.0 MGD must provide at least two sets of flocculation equipment which are designed to operate in parallel. Public water systems with other surface water treatment plants, interconnections with other systems, or wells that can meet the system's average daily demand are exempt from the requirement for redundant flocculation equipment.

(B) Flocculation facilities shall be designed to provide adequate time and mixing intensity to produce a settleable floc under varying raw water characteristics and raw water flow rates.

(i) Flocculation facilities for straight-flow and up-flow sedimentation basins shall provide a minimum theoretical detention time of at least 20 minutes when operated at their design capacity. Flocculation facilities constructed prior to October 1, 2000, are exempt from this requirement if the settled water turbidity of each sedimentation basin remains below 10.0 nephelometric turbidity units and the treatment plant meets with turbidity requirements of §290.111 of this title.

(ii) The mixing intensity in multiple-stage flocculators shall decrease as the coagulated water passes from one stage to the next.

(C) Coagulated water or water from flocculators shall flow to sedimentation basins in such a manner as to prevent destruction of floc. Piping, flumes, and troughs shall be designed to provide a flow velocity of 0.5 to 1.5 feet per second. Gates, ports, and valves shall be designed at a maximum flow velocity of 4.0 feet per second in the transfer of water between units.

(10) Clarification facilities shall be provided.

(A) Plants with a design capacity greater than 3.0 MGD must provide at least two sedimentation basins or clarification units which are designed to operate in parallel. Public water systems with other surface water treatment plants, interconnections with other systems, or wells that can meet the system's average daily demand are exempt from the requirement for redundant sedimentation basins or clarification units.

(B) The inlet and outlet of clarification facilities shall be designed to prevent short-circuiting of flow or the destruction of floc.

(C) Clarification facilities shall be designed to remove flocculated particles effectively.

(i) When operated at their design capacity, basins for straight-flow or up-flow sedimentation of coagulated waters shall provide either a theoretical detention time of at least six hours in the flocculation and sedimentation chambers or a maximum surface overflow rate of 0.6 gpm/sq ft of surface area in the sedimentation chamber.

(ii) When operated at their design capacity, basins for straight-flow or up-flow sedimentation of softened waters shall provide either a theoretical detention time of at least 4.5 hours in the flocculation and sedimentation chambers or a maximum surface overflow rate of 1.0 gpm/sq ft of surface area in the sedimentation chamber.

(iii) When operated at their design capacity, sludge-blanket and solids-recirculation clarifiers shall provide either a theoretical detention time of at least two hours in the flocculation and sedimentation chambers or a maximum surface overflow rate of 1.0 gpm/sq ft in the settling chamber.

(iv) A side wall water depth of at least 12 feet shall be provided in clarification basins that are not equipped with mechanical sludge removal facilities.

(v) The effective length of a straight-flow sedimentation basin shall be at least twice its effective width.

(D) Clarification facilities shall be designed to prevent the accumulation of settled solids.

(i) At treatment plants with a single clarification basin, facilities shall be provided to drain the basin within six hours. In the event that the plant site topography is such that gravity draining cannot be realized, a permanently installed electric-powered pump station shall be provided to dewater the basin. Public water systems with other potable water sources that can meet the system's average daily demand are exempt from this requirement.

(ii) Facilities for sludge removal shall be provided by mechanical means or by hopper-bottomed basins with valves capable of complete draining of the units.

(11) Gravity or pressure type filters shall be provided.

(A) The use of pressure filters shall be limited to installations with a treatment capacity of less than 0.50 MGD.

(B) Filtration facilities shall be designed to operate at filtration rates which assure effective filtration at all times.

(i) The design capacity of gravity rapid sand filters shall not exceed a maximum filtration rate of 2.0 gpm/sq ft. At the beginning of filter runs for declining rate filters, a maximum filtration rate of 3.0 gpm/sq ft is allowed.

(ii) Where high-rate gravity filters are used, the design capacity shall not exceed a maximum filtration rate of 5.0 gpm/sq ft. At the beginning of filter runs for declining rate filters, a maximum filtration rate of 6.5 gpm/sq ft is allowed.

(iii) The design capacity of pressure filters shall not exceed a maximum filtration rate of 2.0 gpm/sq ft with the largest filter off-line.

(iv) Except as provided in clause (vi) of this subparagraph, any surface water treatment plant that provides, or is being designed to provide, less than 7.5 MGD must be able to meet either the maximum daily demand or the minimum required 0.6 gpm per connection, whichever is larger, with all filters on-line.

(v) Any surface water treatment plant that provides, or is being designed to provide, 7.5 MGD or more must be able to meet either the maximum daily demand or the minimum required 0.6 gpm per connection, whichever is larger, with the largest filter off-line.

(vi) Any surface water treatment plant that uses pressure filters must be able to meet either the maximum daily demand or the minimum required 0.6 gpm per connection, whichever is larger, with the largest filter off-line.

(C) The depth and condition of the media and support material shall be sufficient to provide effective filtration.

(i) The filtering material shall conform to American Water Works Association (AWWA) standards and be free from clay, dirt, organic matter, and other impurities.

(ii) The grain size distribution of the filtering material shall be as prescribed by AWWA standards.

(iii) The depth of filter sand, anthracite, granular activated carbon, or other filtering materials shall be 24 inches or greater and provide an L/d ratio, as defined in §290.38 of this title (relating to Definitions), of at least 1,000.

(I) Rapid sand filters typically contain a minimum of eight inches of fine sand with an effective size of 0.35 to 0.45 millimeter (mm), eight inches of medium sand with an effective size of 0.45 to 0.55 mm, and eight inches of coarse sand with an effective size of 0.55 to 0.65 mm. The uniformity coefficient of each size range should not exceed 1.6.

(II) High-rate dual media filters typically contain a minimum of 12 inches of sand with an effective size of 0.45 to 0.55 mm and 24 inches of anthracite with an effective size of 0.9 to 1.1 mm. The uniformity coefficient of each material should not exceed 1.6.

(III) High-rate multi-media filters typically contain a minimum of three inches of garnet media with an effective size of 0.2 to 0.3 mm, nine inches of sand with an effective size of 0.5 to 0.6 mm, and 24 inches of anthracite with an effective size of 0.9 to 1.1 mm. The uniformity coefficient of each size range should not exceed 1.6.

(IV) High-rate mono-media anthracite or granular activated carbon filters typically contain a minimum of 48 inches of anthracite or granular activated carbon with an effective size of 1.0 to 1.2 mm. The uniformity coefficient of each size range should not exceed 1.6.

(iv) Under the filtering material, at least 12 inches of support gravel shall be placed varying in size from 1/16 inch to 2.5 inches. The gravel may be arranged in three to five layers such that each layer contains material about twice the size of the material above it. Other support material may be approved on an individual basis.

(D) The filter shall be provided with facilities to regulate the filtration rate.

(i) With the exception of declining rate filters, each filter unit shall be equipped with a manually adjustable rate-of-flow controller with rate-of-flow indication or flow control valves with indicators.

(ii) Each declining rate filter shall be equipped with a rate-of-flow limiting device or an adjustable flow control valve with a rate-of-flow indicator.

(iii) The effluent line of each filter installed after January 1, 1996, must be equipped with a slow opening valve or another means of automatically preventing flow surges when the filter begins operation.

(E) The filters shall be provided with facilities to monitor the performance of the filter. Monitoring devices shall be designed to provide the ability to measure and record turbidity as required by §290.111 of this title.

(i) Each filter shall be equipped with a sampling tap so that the effluent turbidity of the filter can be individually monitored.

(ii) Each filter operated by a public water system that serves fewer than 10,000 people shall be equipped with an on-line turbidimeter and recorder which will allow the operator to measure and record the turbidity at 15-minute intervals. The executive director may allow combined filter effluent monitoring in lieu of individual filter effluent monitoring under the following conditions:

(I) The public water system has only two filters that were installed prior to October 1, 2000, and were never equipped with individual on-line turbidimeters and recorders; and

(II) The plant is equipped with an on-line turbidimeter and recorder which will allow the operator to measure and record the turbidity level of the combined filter effluent at a location prior to clearwell storage at 15-minute intervals.

(iii) Each filter operated by a public water system that serves at least 10,000 people shall be equipped with an on-line turbidimeter and recorder which will allow the operator to measure and record the turbidity at 15-minute intervals.

(iv) Each filter installed after October 1, 2000, shall be equipped with an on-line turbidimeter and recorder which will allow the operator to determine the turbidity at 15-minute intervals.

(v) Each filter unit that is not equipped with an on-line turbidimeter and recorder shall be equipped with a device to indicate loss of head through the filter. In lieu of loss-of-head indicators, declining rate filter units may be equipped with rate-of-flow indicators.

(F) Filters shall be designed to ensure adequate cleaning during the backwash cycle.

(i) Only filtered water shall be used to backwash the filters. This water may be supplied by elevated wash water tanks, by the effluent of other filters, or by pumps which take suction from the clearwell and are provided for backwashing filters only. For installations having a treatment capacity no greater than 150,000 gallons per day, water for backwashing may be secured directly from the distribution system if proper controls and rate-of-flow limiters are provided.

(ii) The rate of filter backwashing shall be regulated by a rate-of-flow controller or flow control valve.

(iii) The rate of flow of backwash water shall not be less than 20 inches vertical rise per minute (12.5 gpm/sq ft) and usually not more than 35 inches vertical rise per minute (21.8 gpm/sq ft).

(iv) The backwash facilities shall be capable of expanding the filtering bed during the backwash cycle.

(I) For facilities equipped with air scour, the backwash facilities shall be capable of expanding the filtering bed at least 15% during the backwash cycle.

(II) For mixed-media filters without air scour, the backwash facilities shall be capable of expanding the filtering bed at least 25% during the backwash cycle.

(III) For mono-media sand filters without air scour, the backwash facilities shall be capable of expanding the filtering bed at least 40% during the backwash cycle.

(v) The filter freeboard in inches shall exceed the wash rate in inches of vertical rise per minute.

(vi) When used, surface filter wash systems shall be installed with an atmospheric vacuum breaker or a reduced pressure principle backflow assembly in the supply line. If an atmospheric vacuum breaker is used, it shall be installed in a section of the supply line through which all the water passes and which is located above the overflow level of the filter.

(vii) Gravity filters installed after January 1, 1996, shall be equipped with air scour backwash or surface wash facilities.

(G) Each filter installed after October 1, 2000, shall be equipped with facilities that allow the filter to be completely drained without removing other filters from service.

(12) Pipe galleries shall provide ample working room, good lighting, and good drainage provided by sloping floors, gutters, and sumps. Adequate ventilation to prevent condensation and to provide humidity control is also required.

(13) The identification of influent, effluent, waste backwash, and chemical feed lines shall be accomplished by the use of labels or various colors of paint. Where labels are used, they shall be placed along the pipe at no greater than five-foot intervals.

Color coding must be by solid color or banding. If bands are used, they shall be placed along the pipe at no greater than five-foot intervals.

(A) A plant that is built or repainted after October 1, 2000, must use the following color code. The color code to be used in labeling pipes is as follows:

Figure: 30 TAC §290.42(d)(13)(A) (No change to the figure as it currently exists in TAC.)

LETTERS	COLOR OF PIPE
Potable Water	Light Blue
Compressed Air	Light Green
Instrument Air	Light Green with Dark Green Bands
Chlorine (gas, liquid, or vent)	Yellow
Chlorine (solution)	Yellow with Red Bands
Liquid Alum	Yellow with Orange Bands
Alum (solution)	Yellow with Green Bands
Ammonia	Yellow with Brown Bands
Chlorine Dioxide (solution)	Yellow with Blue Bands
Ferric chloride	Brown with Red Bands
Ferric sulfate	Brown with Yellow Bands
Polymers	White with Green Bands
Liquid caustic	White with Red Bands
Caustic (solution)	White with Orange Bands
Fluoride	White with Yellow Bands
Ozone	Stainless Steel with White Bands
Settled Water	Green
Filter Effluent	Light Blue
Backwash Supply	Light Blue
Backwash Waste	Dark Grey
Drain	Dark Grey
Raw Water	Tan

(B) A plant that was repainted before October 1, 2000, may use an alternate color code. The alternate color code must provide clear visual distinction between process streams.

(C) The system must maintain clear, current documentation of its color code in a location easily accessed by all personnel.

(14) All surface water treatment plants shall provide sampling taps for raw, settled, individual filter effluent, and clearwell discharge. Additional sampling taps shall be provided as appropriate to monitor specific treatment processes.

(15) An adequately equipped laboratory shall be available locally so that daily microbiological and chemical tests can be conducted.

(A) For plants serving 25,000 persons or more, the local laboratory used to conduct the required daily microbiological analyses must be accredited by the executive director to conduct coliform analyses.

(B) For plants serving populations of less than 25,000, the facilities for making microbiological tests may be omitted if the required microbiological samples can be submitted to a laboratory accredited by the executive director on a timely basis.

(C) All surface water treatment plants shall be provided with equipment for making at least the following determinations:

(i) pH;

(ii) temperature;

(iii) disinfectant residual;

(iv) alkalinity;

(v) turbidity;

(vi) jar tests for determining the optimum coagulant dose; and

(vii) other tests deemed necessary to monitor specific water quality problems or to evaluate specific water treatment processes.

(D) Each surface water treatment plant that uses chlorine dioxide shall provide testing equipment for measuring chlorine dioxide and chlorite levels [An amperometric titrator with platinum-platinum electrodes shall be provided at all surface water treatment plants that use chlorine dioxide].

(E) Each surface water treatment plant that uses sludge-blanket clarifiers shall be equipped with facilities to monitor the depth of the sludge blanket.

(F) Each surface water treatment plant that uses solids-recirculation clarifiers shall be equipped with facilities to monitor the solids concentration in the slurry.

(16) Each surface water treatment plant shall be provided with a computer and software for recording performance data, maintaining records, and submitting reports to the executive director. The executive director may allow a water system to locate the computer at a site other than the water treatment plant only if performance data can be reliably transmitted to the remote location on a real-time basis, the plant operator has access to the computer at all times, and performance data is readily accessible to agency staff during routine and special investigations.

(17) Reverse osmosis and nanofiltration membrane systems not provided for microbiological quality control shall conform to the requirements of subsection (b)(9) of this section.

(e) Disinfection.

(1) All water obtained from surface sources or groundwater sources that are under the direct influence of surface water must be disinfected in a manner consistent with the requirements of §290.110 of this title [(relating to Disinfectant Residuals)].

(2) All groundwater must be disinfected prior to distribution <u>and in a manner consistent with the requirements of §290.110 of this title</u>. The point of application must be ahead of the water storage tank(s) if storage is provided prior to distribution. Permission to use alternate disinfectant application points must be obtained in writing from the executive director.

(3) Disinfection equipment shall be selected and installed so that continuous and effective disinfection can be secured under all conditions.

(A) Disinfection equipment shall have a capacity at least 50% greater than the highest expected dosage to be applied at any time. It shall be capable of satisfactory operation under every prevailing hydraulic condition.

(B) Automatic proportioning of the disinfectant dosage to the flow rate of the water being treated shall be provided at plants where the treatment rate varies automatically and at all plants where the treatment rate varies more than 50% above or below the average flow. Manual control shall be permissible only if an operator is always on hand to make adjustments promptly.

(C) All disinfecting equipment in surface water treatment plants shall include at least one functional standby unit of each capacity for ensuring uninterrupted operation. Common standby units are permissible but, generally, more than one standby unit must be provided because of the differences in feed rates or the physical state in which the disinfectants are being fed (solid, liquid, or gas).

(D) Facilities shall be provided for determining the amount of disinfectant used daily and the amount of disinfectant remaining for use.

(E) When used, solutions of calcium hypochlorite shall be prepared in a separate mixing tank and allowed to settle so that only a clear supernatant liquid is transferred to the hypochlorinator container.

(F) Provisions shall be made for both pretreatment disinfection and post-disinfection in all surface water treatment plants. Additional application points shall be installed if they are required to adequately control the quality of the treated water.

(G) The use of disinfectants other than free chlorine and chloramines will be considered on a case-by-case basis under the exception guidelines of §290.39(l) of this title. If water containing chloramines and water containing free chlorine are blended, then a case-by-case review under §290.39(l) of this title will be required.

(4) Systems that use chlorine gas must ensure that the risks associated with its use are limited as follows.

(A) When chlorine gas is used, a full-face self-contained breathing apparatus or supplied air respirator that meets Occupational Safety and Health Administration (OSHA) standards for construction and operation, and a small bottle of fresh ammonia solution (or approved equal) for testing for chlorine leakage shall be readily accessible outside the chlorinator room and immediately available to the operator in the event of an emergency.

(B) Housing for gas chlorination equipment and cylinders of chlorine shall be in separate buildings or separate rooms with impervious walls or partitions separating all mechanical and electrical equipment from the chlorine facilities. Housing shall be located above ground level as a measure of safety. Equipment and cylinders may be installed on the outside of the buildings when protected from adverse weather conditions and vandalism.

(C) Adequate ventilation, which includes both high level and floor level screened vents, shall be provided for all enclosures in which gas chlorine is being stored or fed. Enclosures containing more than one operating 150-pound cylinder of chlorine shall also provide forced air ventilation which includes: screened and louvered floor level and high level vents; a fan which is located at and draws air in through the top vent and discharges to the outside atmosphere through the floor level vent; and a fan

switch located outside the enclosure. Alternately, systems may install negative pressure ventilation as long as the facilities also have gas containment and treatment as prescribed by the current International Fire Code (IFC).

(5) Hypochlorination solution containers and pumps must be housed in a secure enclosure to protect them from adverse weather conditions and vandalism. The solution container top must be completely covered to prevent the entrance of dust, insects, and other contaminants.

(6) Where anhydrous ammonia feed equipment is utilized, it must be housed in a separate enclosure equipped with both high and low level ventilation to the outside atmosphere. The enclosure must be provided with forced air ventilation which includes: screened and louvered floor level and high level vents; a fan which is located at and draws air in through the floor vent and discharges through the top vent; and a fan switch located outside the enclosure. Alternately, systems may install negative pressure ventilation as long as the facilities also have gas containment and treatment as prescribed by the current IFC.

(7) Chloramine disinfection shall be performed in a manner which assures that the proper chlorine to ammonia (as nitrogen) ratio is achieved in order to maintain a monochloramine residual and limit nitrification.

(A) The order of chlorine and ammonia injection must be accomplished in a manner which allows inactivation of viruses and oxidation of cyanide.

(i) When chlorine is injected upstream of any other disinfectant, the ammonia injection point must be downstream of the chlorine injection point.

(ii) When chlorine and ammonia are added to distribution water that has a chloramine residual, ammonia should be added first.

(iii) When chlorine and ammonia are added to distribution water that has a free chlorine residual, chlorine should be added first.

(B) Mixing shall be provided to disperse chemicals.

(C) Sampling taps must be provided at locations that allow for chlorine and ammonia to be added to the water to form monochloramine as the primary chloramine species. These locations must be listed in the system's monitoring plan as described in §290.121 of this title (relating to Monitoring Plans). Sample taps must be provided as follows:

(i) upstream of the chlorine or ammonia chemical injection point, whichever is furthest upstream;

(ii) between the addition of the chloramine chemicals at chloramination facilities submitted for plan review after December 31, 2015. For these facilities, an installation without this sample tap may be approved if an acceptable technical reason is described in the plan review documents. Technical reasons, such as disinfection byproduct control, must be supported by bench scale sampling results. Other technical reasons, such as membrane integrity, must be supported by documentation; and

(iii) at a point after mixing to be able to measure fully-formed monochloramine levels.

(D) When using chloramines, the feed and storage must be designed as described in subsection (f) of this section, regardless of water source.

(E) When using chloramines, the public water systems shall provide equipment for making at least the following determinations for purposes of complying with the requirements in §290.110 of this title:

(i) free ammonia (as nitrogen);

(ii) monochloramine;

(iii) total chlorine;

(iv) free chlorine; and

(v) nitrite and nitrate (both as nitrogen). The public water systems must either obtain equipment for measuring nitrite and nitrate or identify an accredited laboratory that can perform nitrite and nitrate analysis and can provide results to the public water systems within 48 hours of sample delivery.

(f) Water treatment plant chemical storage and feed facilities.

(1) Chemical storage facilities shall be designed to ensure a reliable supply of chemicals to the feeders, minimize the possibility and impact of accidental spills, and facilitate good housekeeping.

(A) Bulk storage facilities at the plant shall be adequate to store at least a 15-day supply of all chemicals needed to comply with minimum treatment technique and maximum contaminant level (MCL) requirements. The capacity of these bulk storage facilities shall be based on the design capacity of the treatment plant. However, the executive director may require a larger stock of chemicals based on local resupply ability.

(B) Day tanks shall be provided to minimize the possibility of severely overfeeding liquid chemicals from bulk storage facilities. Day tanks will not be required if adequate process control instrumentation and procedures are employed to prevent chemical overfeed incidents.

(C) Every chemical bulk storage facility and day tank shall have a label that identifies the facility's or tank's contents and a device that indicates the amount of chemical remaining in the facility or tank.

(D) Dry chemicals shall be stored off the floor in a dry room that is located above ground and protected against flooding or wetting from floors, walls, and ceilings.

(E) Bulk storage facilities and day tanks must be designed to minimize the possibility of leaks and spills.

(i) The materials used to construct bulk storage and day tanks must be compatible with the chemicals being stored and resistant to corrosion.

(ii) Except as provided in this clause, adequate containment facilities shall be provided for all liquid chemical storage tanks.

(I) Containment facilities for a single container or for multiple interconnected containers must be large enough to hold the maximum amount of chemical that can be stored with a minimum freeboard of six vertical inches or to hold 110% of the total volume of the container(s), whichever is less.

(II) Common containment for multiple containers that are not interconnected must be large enough to hold the volume of the largest container with a minimum freeboard of six vertical inches or to hold 110% of the total volume of the container(s), whichever is less.

(III) The materials used to construct containment structures must be compatible with the chemicals stored in the tanks.

(IV) Incompatible chemicals shall not be stored within the same containment structure.

(V) No containment facilities are required for hypochlorite solution containers that have a capacity of 55 gallons or less.

(VI) On a site-specific basis, the executive director may approve the use of double-walled tanks in lieu of separate containment facilities.

(F) Chemical transfer pumps and control systems must be designed to minimize the possibility of leaks and spills.

(G) Piping, pumps, and valves used for chemical storage and transfer must be compatible with the chemical being fed.

(2) Chemical feed and metering facilities shall be designed so that chemicals shall be applied in a manner which will maximize reliability, facilitate maintenance, and ensure optimal finished water quality.

(A) Each chemical feeder that is needed to comply with a treatment technique or MCL requirement shall have a standby or reserve unit. Common standby feeders are permissible, but generally, more than one standby feeder must be provided due to the incompatibility of chemicals or the state in which they are being fed (solid, liquid, or gas).

(B) Chemical feed equipment shall be sized to provide proper dosage under all operating conditions.

(i) Devices designed for determining the chemical feed rate shall be provided for all chemical feeders.

(ii) The capacity of the chemical feeders shall be such that accurate control of the dosage can be achieved at the full range of feed rates expected to occur at the facility.

(iii) Chemical feeders shall be provided with tanks for chemical dissolution when applicable.

(C) Chemical feeders, valves, and piping must be compatible with the chemical being fed.

(D) Chemical feed systems shall be designed to minimize the possibility of leaks and spills and provide protection against backpressure and siphoning.

(E) If enclosed feed lines are used, they shall be designed and installed so as to prevent clogging and be easily maintained.

(F) Dry chemical feeders shall be located in a separate room that is provided with facilities for dust control.

(G) Coagulant feed systems shall be designed so that coagulants are applied to the water prior to or within the mixing basins or chambers so as to permit their complete mixing with the water.

(i) Coagulant feed points shall be located downstream of the raw water sampling tap.

(ii) Coagulants shall be applied continuously during treatment plant operation.

(H) Chlorine feed units, ammonia feed units, and storage facilities shall be separated by solid, sealed walls.

(I) Chemical application points shall be provided to achieve acceptable finished water quality, adequate taste and odor control, corrosion control, and disinfection.

(g) Other treatment processes. Innovative/alternate treatment processes will be considered on an individual basis, in accordance with §290.39(l) of this title. Where innovative/alternate treatment systems are proposed, the licensed professional engineer must provide pilot test data or data collected at similar full-scale operations demonstrating that the system will produce water that meets the requirements of Subchapter F of this chapter. Pilot test data must be representative of the actual operating conditions which can be expected over the course of the year. The executive director may require a pilot study protocol to be submitted for review and approval prior to conducting a pilot study to verify compliance with the requirements of §290.39(l) of this title and Subchapter F of this chapter. The executive director may require proof of a

one-year manufacturer's performance warrantee or guarantee assuring that the plant will produce treated water which meets minimum state and federal standards for drinking water quality.

(1) Package-type treatment systems and their components shall be subject to all applicable design criteria in this section.

(2) Bag and cartridge filtration systems or modules installed or replaced after April 1, 2012, and used for microbiological treatment, can receive up to 3.0-log *Giardia* removal credit, up to 2.0-log *Cryptosporidium* removal credit for individual bag or cartridge filters, and up to 2.5-log *Cryptosporidium* removal credit for bag or cartridge filters operated in series only if the cartridges or bags meet the criteria in subparagraphs (A) - (C) of this paragraph.

(A) The filter system must treat the entire plant flow.

(B) To be eligible for this credit, systems must receive approval from the executive director based on the results of challenge testing that is conducted according to the criteria established by 40 Code of Federal Regulations (CFR) §141.719(a) and the executive director.

(i) A factor of safety equal to 1.0-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series must be applied to challenge testing results to determine removal credit.

(ii) Challenge testing must be performed on full-scale bag or cartridge filters, and the associated filter housing or pressure vessel, that are identical in material and construction to the filters and housings the system will use for removal of *Cryptosporidium* and *Giardia*.

(iii) Bag or cartridge filters must be challenge tested in the same configuration that the system will use, either as individual filters or as a series configuration of filters.

(iv) Systems may use results from challenge testing conducted prior to January 5, 2006, if prior testing was consistent with 40 CFR §141.719, submitted by the system's licensed professional engineer, and approved by the executive director.

(v) If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, additional challenge testing to demonstrate the removal efficiency of the modified filter must be conducted and results submitted to the executive director for approval.

(C) Pilot studies must be conducted using filters that will meet the requirements of this section.

(3) Membrane filtration systems or modules installed or replaced after April 1, 2012, and used for microbiological treatment, can receive *Cryptosporidium* and *Giardia* removal credit for membrane filtration only if the systems or modules meet the criteria in subparagraphs (A) - (F) of this paragraph.

(A) The membrane module used by the system must undergo challenge testing to evaluate removal efficiency. Challenge testing must be conducted according to the criteria established by 40 CFR §141.719(b)(2) and the executive director.

(i) All membrane module challenge test protocols and results, the protocol for calculating the representative Log Removal Value (LRV) for each membrane module, the removal efficiency, calculated results of Membrane $LRV_{C\text{-}Test}$, and the non-destructive performance test with its Quality Control Release Value (QCRV) must be submitted to the executive director for review and approval prior to beginning a membrane filtration pilot study at a public water system.

(ii) Challenge testing must be conducted on either a full-scale membrane module identical in material and construction to the membrane modules to be used in the system's treatment facility, or a smaller-scale membrane module identical in

material and similar in construction to the full-scale module if approved by the executive director.

(iii) Systems may use data from challenge testing conducted prior to January 5, 2006, if prior testing was consistent with 40 CFR §141.719, submitted by the system's licensed professional engineer, and approved by the executive director.

(iv) If a previously tested membrane is modified in a manner that could change the removal efficiency of the membrane product line or the applicability of the non-destructive performance test and associated QCRV, additional challenge testing to demonstrate the removal efficiency of the modified membrane and determine a new QCRV for the modified membrane must be conducted and results submitted to the executive director for approval.

(B) The membrane system must be designed to conduct and record the results of direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration system approved by the executive director and meets the requirements in clauses (i) and (ii) of this subparagraph.

(i) The design must provide for direct integrity testing of each membrane unit.

(ii) The design must provide direct integrity testing that has a resolution of 3 micrometers or less.

(iii) The design must provide direct integrity testing with sensitivity sufficient to verify the log removal credit approved by the executive director. Sensitivity is determined by the criteria in 40 CFR §141.719(b)(3)(iii).

(iv) The executive director may reduce the direct integrity testing requirements for membrane units.

(C) The membrane system must be designed to conduct and record continuous indirect integrity monitoring on each membrane unit. The turbidity of the water produced by each membrane unit must be measured using the Hach FilterTrak Method 10133. The executive director may approve the use of alternative technology to monitor the quality of the water produced by each membrane unit.

(D) The level of removal credit approved by the executive director shall not exceed the lower of:

(i) the removal efficiency demonstrated during challenge testing conducted under the conditions in subparagraph (A) of this paragraph, or

(ii) the maximum removal efficiency that can be verified through direct integrity testing used with the membrane filtration process under the conditions in subparagraph (B) of this paragraph.

(E) Pilot studies must be conducted using membrane modules that will meet the requirements of this section.

(F) Membrane systems must be designed so that membrane units' feed water, filtrate, backwash supply, waste, and chemical cleaning piping shall have cross-connection protection to prevent chemicals from all chemical cleaning processes from contaminating other membrane units in other modes of operation. This may be accomplished by the installation of a double block and bleed valving arrangement, a removable spool system, or other alternative methods approved by the executive director.

(4) Bag, cartridge, or membrane filtration systems or modules installed or replaced before April 1, 2012, and used for microbiological treatment, can receive up to a 2.0-log removal credit for *Cryptosporidium* and up to a 3.0-log removal credit for *Giardia* based on site-specific pilot study results, design, operation, and reporting requirements.

(5) Ultraviolet (UV) light reactors used for microbiological inactivation can receive *Cryptosporidium*, *Giardia*, and virus inactivation credit if the reactors meet the criteria in subparagraphs (A) - (C) of this paragraph.

(A) UV light reactors can receive inactivation credit only if they are located after filtration.

(B) In lieu of a pilot study, the UV light reactors must undergo validation testing to determine the operating conditions under which a UV reactor delivers the required UV dose. Validation testing must be conducted according to the criteria established by 40 CFR §141.720(d)(2) and the executive director.

(i) The validation study must include the following factors: UV absorbance of the water; lamp fouling and aging; measurement uncertainty of on-line sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps and other critical system components; inlet and outlet piping or channel configuration of the UV reactor; lamp and sensor locations; and other parameters determined by the executive director.

(ii) Validation testing must be conducted on a full-scale reactor that is essentially identical to the UV reactor(s) to be used by the system and using waters that are essentially identical in quality to the water to be treated by the UV reactor.

(C) The UV light reactor systems must be designed to monitor and record parameters to verify the UV reactors operation within the validated conditions approved by the executive director. The UV light reactor must be equipped with facilities

to monitor and record UV intensity as measured by a UV sensor, flow rate, lamp status, and other parameters designated by the executive director.

(6) Membrane filtration used by groundwater systems to achieve at least 4-log removal of viruses to comply with the groundwater rule requirements under §290.109 of this title (relating to Microbial Contaminants) and §290.116 of this title, the public water system shall meet the following criteria.

(A) The membrane module must have an absolute molecular weight cut-off, or an alternate parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4-log removal of viruses.

(B) The membrane system must be designed to conduct and record the results of integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane system approved by the executive director.

(h) Sanitary facilities for water works installations. Toilet and hand washing facilities provided in accordance with established standards of good public health engineering practices shall be available at all installations requiring frequent visits by operating personnel.

(i) Permits for waste discharges. Any discharge of wastewater and other plant wastes shall be in accordance with all applicable state and federal statutes and regulations. Permits for discharging wastes from water treatment processes shall be obtained from the commission, if necessary.

(j) Treatment chemicals and media. All chemicals and any additional or replacement process media used in treatment of water supplied by public water systems must conform to ANSI/NSF Standard 60 for Drinking Water Treatment Chemicals and ANSI/NSF Standard 61 for Drinking Water System Components. Conformance with these standards must be obtained by certification of the product by an organization accredited by ANSI.

(k) Safety.

(1) Safety equipment for all chemicals used in water treatment shall meet applicable standards established by the OSHA or Texas Hazard Communication Act, Texas Health and Safety Code, Chapter 502.

(2) Systems must comply with United States Environmental Protection Agency (EPA) requirements for Risk Management Plans.

(l) Plant operations manual. A thorough plant operations manual must be compiled and kept up-to-date for operator review and reference. This manual should be of

sufficient detail to provide the operator with routine maintenance and repair procedures, with protocols to be utilized in the event of a natural or man-made catastrophe, as well as provide telephone numbers of water system personnel, system officials, and local/state/federal agencies to be contacted in the event of an emergency. If operating a reverse osmosis or nanofiltration membrane system, the manual must also include the system's configuration, baseline performance data, and any set point for membrane cleaning or replacement.

(m) Security. Each water treatment plant and all appurtenances thereof shall be enclosed by an intruder-resistant fence. The gates shall be locked during periods of darkness and when the plant is unattended. A locked building in the fence line may satisfy this requirement or serve as a gate.

(n) Corrosion control treatment. Systems must install any corrosion control or source water treatment required by §290.117(f) and (g) of this title (relating to Regulation of Lead and Copper), respectively. Such treatment must be designed and installed consistent with the requirements of this subchapter. The requirements of 40 CFR §141.82(i) and §141.83(b)(7) relating to EPA involvement in treatment determination are adopted by reference.

§290.46. Minimum Acceptable Operating Practices for Public Drinking Water Systems.

(a) General. When a public drinking water supply system is to be established, plans shall be submitted to the executive director for review and approval prior to the construction of the system. All public water systems are to be constructed in conformance with the requirements of this subchapter and maintained and operated in accordance with the following minimum acceptable operating practices. Owners and operators shall allow entry to members of the commission and employees and agents of the commission onto any public or private property at any reasonable time for the purpose of inspecting and investigating conditions relating to public water systems in the state including the required elements of a sanitary survey as defined in §290.38 of this title (relating to Definitions). Members, employees, or agents acting under this authority shall observe the establishment's rules and regulations concerning safety, internal security, and fire protection, and if the property has management in residence, shall notify management or the person then in charge of his presence and shall exhibit proper credentials.

(b) Microbiological. Submission of samples for microbiological analysis shall be as required by Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems). Microbiological samples may be required by the executive director for monitoring purposes in addition to the routine samples required by the drinking water standards. These samples shall be submitted to an accredited laboratory. (A list of the accredited laboratories can be obtained by contacting the executive director.) The samples shall be submitted to the executive director in a manner prescribed by the executive director.

(c) Chemical. Samples for chemical analysis shall be submitted as directed by the executive director.

(d) Disinfectant residuals and monitoring. A disinfectant residual must be continuously maintained during the treatment process and throughout the distribution system.

(1) Disinfection equipment shall be operated and monitored in a manner that will assure compliance with the requirements of §290.110 of this title (relating to Disinfectant Residuals).

(2) The disinfection equipment shall be operated to maintain the following minimum disinfectant residuals in each finished water storage tank and throughout the distribution system at all times:

(A) a free chlorine residual of 0.2 milligrams per liter (mg/L); or

(B) a chloramine residual of 0.5 mg/L (measured as total chlorine) for those systems that distribute chloraminated water.

(e) Operation by trained and licensed personnel. Except as provided in paragraph (1) of this subsection, the production, treatment, and distribution facilities at the public

water system must be operated at all times under the direct supervision of a water works operator who holds an applicable, valid license issued by the executive director. Except as provided in paragraph (1) of this subsection, all public water systems must use a water works operator who holds an applicable, valid license issued by the executive director to meet the requirements of this subsection. The licensed operator of a public water system may be an employee, contractor, or volunteer.

(1) Transient, noncommunity public water systems are exempt from the requirements of this subsection if they use only groundwater or purchase treated water from another public water system.

(2) All public water systems that are subject to the provisions of this subsection shall meet the following requirements.

(A) Public water systems shall not allow new or repaired production, treatment, storage, pressure maintenance, or distribution facilities to be placed into service without the prior guidance and approval of a licensed water works operator.

(B) Public water systems shall ensure that their operators are trained regarding the use of all chemicals used in the water treatment plant. Training programs shall meet applicable standards established by the Occupational Safety and Health Administration or the Texas Hazard Communication Act, Texas Health and Safety Code, Chapter 502.

(C) Public water systems using chlorine dioxide shall place the operation of the chlorine dioxide facilities under the direct supervision of a licensed operator who has a Class "C" or higher license.

(D) Effective September 1, 2016, reverse osmosis or nanofiltration membrane systems must have operators that have successfully completed at least one executive director-approved training course or event specific to the operations and maintenance of reverse osmosis or nanofiltration membrane treatment.

(3) Systems that only purchase treated water shall meet the following requirements in addition to the requirements contained in paragraph (2) of this subsection.

(A) Purchased water systems serving no more than 250 connections must use an operator who holds a Class "D" or higher license.

(B) Purchased water systems serving more than 250 connections, but no more than 1,000 connections, must use an operator who holds a Class "C" or higher license.

(C) Purchased water systems serving more than 1,000 connections must use at least two operators who hold a Class "C" or higher license and who each work

at least 16 hours per month at the public water system's treatment or distribution facilities.

(4) Systems that treat groundwater and do not treat surface water or groundwater that is under the direct influence of surface water shall meet the following requirements in addition to the requirements contained in paragraph (2) of this subsection.

(A) Groundwater systems serving no more than 250 connections must use an operator with a Class "D" or higher license.

(B) Groundwater systems serving more than 250 connections, but no more than 1,000 connections, must use an operator with a Class "C" or higher groundwater license.

(C) Groundwater systems serving more than 1,000 connections must use at least two operators who hold a Class "C" or higher groundwater license and who each work at least 16 hours per month at the public water system's production, treatment, or distribution facilities.

(5) Systems that treat groundwater that is under the direct influence of surface water must meet the following requirements in addition to the requirements contained in paragraph (2) of this subsection.

(A) Systems which serve no more than 1,000 connections and utilize cartridge or membrane filters must use an operator who holds a Class "C" or higher groundwater license and has completed a four-hour training course on monitoring and reporting requirements or who holds a Class "C" or higher surface water license and has completed the Groundwater Production course.

(B) Systems which serve more than 1,000 connections and utilize cartridge or membrane filters must use at least two operators who meet the requirements of subparagraph (A) of this paragraph and who each work at least 24 hours per month at the public water system's production, treatment, or distribution facilities.

(C) Systems which serve no more than 1,000 connections and utilize coagulant addition and direct filtration must use an operator who holds a Class "C" or higher surface water license and has completed the Groundwater Production course or who holds a Class "C" or higher groundwater license and has completed a Surface Water Production course. Effective January 1, 2007, the public water system must use at least one operator who has completed the Surface Water Production I course and the Surface Water Production II course.

(D) Systems which serve more than 1,000 connections and utilize coagulant addition and direct filtration must use at least two operators who meet the requirements of subparagraph (C) of this paragraph and who each work at least 24 hours

per month at the public water system's production, treatment, or distribution facilities. Effective January 1, 2007, the public water system must use at least two operators who have completed the Surface Water Production I course and the Surface Water Production II course.

(E) Systems which utilize complete surface water treatment must comply with the requirements of paragraph (6) of this subsection.

(F) Each plant must have at least one Class "C" or higher operator on duty at the plant when it is in operation or the plant must be provided with continuous turbidity and disinfectant residual monitors with automatic plant shutdown and alarms to summon operators so as to ensure that the water produced continues to meet the commission's drinking water standards during periods when the plant is not staffed.

(6) Systems that treat surface water must meet the following requirements in addition to the requirements contained in paragraph (2) of this subsection.

(A) Surface water systems that serve no more than 1,000 connections must use at least one operator who holds a Class "B" or higher surface water license. Part-time operators may be used to meet the requirements of this subparagraph if the operator is completely familiar with the design and operation of the plant and spends at least four consecutive hours at the plant at least once every 14 days and the system also uses an operator who holds a Class "C" or higher surface water license. Effective January

1, 2007, the public water system must use at least one operator who has completed the Surface Water Production I course and the Surface Water Production II course.

(B) Surface water systems that serve more than 1,000 connections must use at least two operators; one of the required operators must hold a Class "B" or higher surface water license and the other required operator must hold a Class "C" or higher surface water license. Each of the required operators must work at least 32 hours per month at the public water system's production, treatment, or distribution facilities. Effective January 1, 2007, the public water system must use at least two operators who have completed the Surface Water Production I course and the Surface Water Production II course.

(C) Each surface water treatment plant must have at least one Class "C" or higher surface water operator on duty at the plant when it is in operation or the plant must be provided with continuous turbidity and disinfectant residual monitors with automatic plant shutdown and alarms to summon operators so as to ensure that the water produced continues to meet the commission's drinking water standards during periods when the plant is not staffed.

(D) Public water systems shall not allow Class "D" operators to adjust or modify the treatment processes at surface water treatment plant unless an operator who holds a Class "C" or higher surface license is present at the plant and has issued specific instructions regarding the proposed adjustment.

(f) Operating records and reports. All public water [Water] systems must maintain a record of water works operation and maintenance activities and submit periodic operating reports.

(1) The public water system's operating records must be organized, and copies must be kept on file or stored electronically.

(2) The public water system's operating records must be accessible for review during inspections and be available to the executive director upon request.

(3) All public water systems shall maintain a record of operations.

(A) The following records shall be retained for at least two years:

(i) the amount of chemicals used:

(I) Systems that treat surface water or groundwater under the direct influence of surface water shall maintain a record of the amount of each chemical used each day.

(II) Systems that serve 250 or more connections or serve 750 or more people shall maintain a record of the amount of each chemical used each day.

(III) Systems that serve fewer than 250 connections, serve fewer than 750 people, and use only groundwater or purchased treated water shall maintain a record of the amount of each chemical used each week;

(ii) the volume of water treated and distributed:

(I) Systems that treat surface water or groundwater under the direct influence of surface water shall maintain a record of the amount of water treated and distributed each day.

(II) Systems that serve 250 or more connections or serve 750 or more people shall maintain a record of the amount of water distributed each day.

(III) Systems that serve fewer than 250 connections, serve fewer than 750 people, and use only groundwater or purchase treated water shall maintain a record of the amount of water distributed each week.

(IV) Systems that serve 250 or more connections or serve 750 or more people and also add chemicals or provide pathogen or chemical removal shall maintain a record of the amount of water treated each day.

(V) Systems that serve fewer than 250 connections, serve fewer than 750 people, use only groundwater or purchase treated water, and also add chemicals or provide pathogen or chemical removal shall maintain a record of the amount of water treated each week;

(iii) the date, location, and nature of water quality, pressure, or outage complaints received by the system and the results of any subsequent complaint investigation;

(iv) the dates that dead-end mains were flushed;

(v) the dates that storage tanks and other facilities were cleaned;

(vi) the maintenance records for water system equipment and facilities. For systems using reverse osmosis or nanofiltration, maintain records of each clean-in-place process including the date, duration, and procedure used for each event;

(vii) for systems that do not employ full-time operators to meet the requirements of subsection (e) of this section, a daily record or a monthly summary of the work performed and the number of hours worked by each of the part-time operators used to meet the requirements of subsection (e) of this section; and

(viii) the owner or manager of a public water system that is operated by a volunteer to meet the requirements of subsection (e) of this section, shall maintain a record of each volunteer operator indicating the name of the volunteer, contact information for the volunteer, and the time period for which the volunteer is responsible for operating the public water system. These requirements apply to full-time and part-time licensed volunteer operators. Part-time licensed volunteer operators are excluded from the requirements of clause (vii) of this subparagraph.

(B) The following records shall be retained for at least three years:

(i) copies of notices of violation and any resulting corrective actions. The records of the actions taken to correct violations of primary drinking water regulations must be retained for at least three years after the last action taken with respect to the particular violation involved;

(ii) copies of any public notice issued by the water system;

(iii) the disinfectant residual monitoring results from the distribution system;

(iv) the calibration records for laboratory equipment, flow meters, rate-of-flow controllers, on-line turbidimeters, and on-line disinfectant residual analyzers;

(v) the records of backflow prevention device programs;

(vi) the raw surface water monitoring results and source water monitoring plans required by §290.111 of this title (relating to Surface Water Treatment) must be retained for three years after bin classification required by §290.111 of this title;

(vii) notification to the executive director that a system will provide 5.5-log *Cryptosporidium* treatment in lieu of raw surface water monitoring;

(viii) except for those specified in subparagraphs (C)(iv) and (E)(i) of this paragraph, the results of all surface water treatment monitoring that are used to demonstrate log inactivation or removal;

(ix) free and total chlorine, monochloramine, ammonia, nitrite, and nitrate monitoring results if chloramines are used in the water system; and

(x) the records of treatment effectiveness monitoring for systems using reverse osmosis or nanofiltration membranes. Treatment effectiveness monitoring includes the parameters for determining when maintenance is required. Examples of parameters to be monitored include conductivity (or total dissolved solids) on each membrane unit, pressure differential across a membrane vessel, flow, flux, and water temperature. At a minimum, systems using reverse osmosis or nanofiltration

membranes must monitor the conductivity (or total dissolved solids) of the feed and permeate water once per day.

(C) The following records shall be retained for a period of five years after they are no longer in effect:

(i) the records concerning a variance or exemption granted to the system;

(ii) Concentration Time (CT) studies for surface water treatment plants;

(iii) the Recycling Practices Report form and other records pertaining to site-specific recycle practices for treatment plants that recycle; and

(iv) the turbidity monitoring results and exception reports for individual filters as required by §290.111 of this title.

(D) The following records shall be retained for at least five years:

(i) the results of microbiological analyses;

(ii) the results of inspections (as required in subsection (m)(1) of this section) for all water storage and pressure maintenance facilities;

(iii) the results of inspections (as required by subsection (m)(2) of this section) for all pressure filters;

(iv) documentation of compliance with state approved corrective action plan and schedules required to be completed by groundwater systems that must take corrective actions;

(v) documentation of the reason for an invalidated fecal indicator source sample and documentation of a total coliform-positive sample collected at a location with conditions that could cause such positive samples in a distribution system;

(vi) notification to wholesale system(s) of a distribution coliform-positive [coliform positive] sample for consecutive systems using groundwater;

(vii) Consumer Confidence Report compliance documentation;

(viii) records of the lowest daily residual disinfectant concentration and records of the date and duration of any failure to maintain the

executive director-approved minimum specified disinfectant residual for a period of more than four hours for groundwater systems providing 4-log treatment; [and]

(ix) records of executive director-specified compliance requirements for membrane filtration, records of parameters specified by the executive director for approved alternative treatment and records of the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours for groundwater systems. Membrane filtration can only be used if it is approved by the executive director and if it can be properly validated;[.]

(x) assessment forms and documentation of corrective actions completed as a result of those assessments and any other available summary documentation of the sanitary defects and corrective actions taken in accordance with §290.109 of this title (relating to Microbial Contaminants) for executive director review; and

(xi) seasonal public water systems shall maintain executive director-approved start-up procedures and certification documentation in accordance with §290.109 of this title for executive director review.

(E) The following records shall be retained for at least ten years:

(i) copies of Monthly Operating Reports and any supporting documentation including turbidity monitoring results of the combined filter effluent;

(ii) the results of chemical analyses;

(iii) any written reports, summaries, or communications relating to sanitary surveys of the system conducted by the system itself, by a private consultant, or by the executive director shall be kept for a period not less than ten years after completion of the survey involved;

(iv) copies of the Customer Service Inspection reports required by subsection (j) of this section;

(v) copy of any Initial Distribution System Evaluation (IDSE) plan, report, approval letters, and other compliance documentation required by §290.115 of this title (relating to Stage 2 Disinfection Byproducts (TTHM and HAA5));

(vi) state notification of any modifications to an IDSE report;

(vii) copy of any 40/30 certification required by §290.115 of this title;

(viii) documentation of corrective actions taken by groundwater systems in accordance with §290.116 of this title (relating to Groundwater Corrective Actions and Treatment Techniques);

(ix) any Sample Siting Plans required by §290.109(d)(6) of this title and monitoring plans required by §290.121(b) of this title (relating to Monitoring Plans); and

(x) records of the executive director-approved minimum specified disinfectant residual and executive director-approved membrane system integrity monitoring results for groundwater systems providing 4-log treatment, including wholesale, and consecutive [, and mixed] systems, regulated under §290.116(c) of this title.

(F) A public water system shall maintain records relating to lead and copper requirements under §290.117 of this title (relating to Regulation of Lead and Copper) for no less than 12 years. Any system subject to the requirements of §290.117 of this title shall retain on its premises original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, executive determinations, and any other information required by the executive director under §290.117 of this title. These records include, but are not limited to, the following items: tap water monitoring results including the location of each site and date of collection; certification of the volume and validity of first-draw-tap sample criteria via a copy of the laboratory analysis request

form; where residents collected the sample; certification that the water system informed the resident of proper sampling procedures; the analytical results for lead and copper concentrations at each tap sample site; and designation of any substitute site not used in previous monitoring periods.

(G) A public water system shall maintain records relating to special studies and pilot projects, special monitoring, and other system-specific matters as directed by the executive director.

(4) Public water [Water] systems shall submit routine reports and any additional documentation that the executive director may require to determine compliance with the requirements of this chapter.

(A) The reports must be submitted to the Texas Commission on Environmental Quality, Water Supply Division, MC 155, P.O. Box 13087, Austin, Texas 78711-3087 by the tenth day of the month following the end of the reporting period.

(B) The reports must contain all the information required by the drinking water standards and the results of any special monitoring tests which have been required.

(C) The reports must be completed in ink, typed, or computer-printed and must be signed by the licensed water works operator.

(5) All public water systems that are affected utilities must maintain the following records for as long as they are applicable to the system:

(A) An emergency preparedness plan approved by the executive director and a copy of the approval letter.

(B) All required operating and maintenance records for auxiliary power equipment, including periodic testing of the auxiliary power equipment under load and any associated automatic switch over equipment.

(C) Copies of the manufacturer's specifications for all generators that are part of the approved emergency preparedness plan.

(g) Disinfection of new or repaired facilities. Disinfection by or under the direction of water system personnel must be performed when repairs are made to existing facilities and before new facilities are placed into service. Disinfection must be performed in accordance with American Water Works Association (AWWA) requirements and water samples must be submitted to a laboratory approved by the executive director. The sample results must indicate that the facility is free of microbiological contamination before it is placed into service. When it is necessary to return repaired mains to service as rapidly as possible, doses may be increased to 500 mg/L and the contact time reduced to 1/2 hour.

(h) Calcium hypochlorite. A supply of calcium hypochlorite disinfectant shall be kept on hand for use when making repairs, setting meters, and disinfecting new mains prior to placing them in service.

(i) Plumbing ordinance. Public water systems must adopt an adequate plumbing ordinance, regulations, or service agreement with provisions for proper enforcement to insure that neither cross-connections nor other unacceptable plumbing practices are permitted (See §290.47(b) of this title (relating to Appendices)). Should sanitary control of the distribution system not reside with the purveyor, the entity retaining sanitary control shall be responsible for establishing and enforcing adequate regulations in this regard. The use of pipes and pipe fittings that contain more than 0.25% lead or solders and flux that contain more than 0.2% lead is prohibited for installation or repair of any public water supply and for installation or repair of any plumbing in a residential or nonresidential facility providing water for human consumption and connected to a public drinking water supply system. This requirement may be waived for lead joints that are necessary for repairs to cast iron pipe.

(j) Customer service inspections. A customer service inspection certificate shall be completed prior to providing continuous water service to new construction, on any existing service either when the water purveyor has reason to believe that cross-connections or other potential contaminant hazards exist, or after any material improvement, correction, or addition to the private water distribution facilities. Any

customer service inspection certificate form which varies from the format found in commission Form 20699 must be approved by the executive director prior to being placed in use.

(1) Individuals with the following credentials shall be recognized as capable of conducting a customer service inspection certification.

(A) Plumbing Inspectors and Water Supply Protection Specialists licensed by the Texas State Board of Plumbing Examiners (TSBPE).

(B) Customer service inspectors who have completed a commission-approved course, passed an examination administered by the executive director, and hold current professional license as a customer service inspector.

(2) As potential contaminant hazards are discovered, they shall be promptly eliminated to prevent possible contamination of the water supplied by the public water system. The existence of a health hazard, as identified in §290.47(f) of this title, shall be considered sufficient grounds for immediate termination of water service. Service can be restored only when the health hazard no longer exists, or until the health hazard has been isolated from the public water system in accordance with §290.44(h) of this title (relating to Water Distribution).

(3) These customer service inspection requirements are not considered acceptable substitutes for and shall not apply to the sanitary control requirements stated in §290.102(a)(5) of this title (relating to General Applicability).

(4) A customer service inspection is an examination of the private water distribution facilities for the purpose of providing or denying water service. This inspection is limited to the identification and prevention of cross-connections, potential contaminant hazards, and illegal lead materials. The customer service inspector has no authority or obligation beyond the scope of the commission's regulations. A customer service inspection is not a plumbing inspection as defined and regulated by the TSBPE. A customer service inspector is not permitted to perform plumbing inspections. State statutes and TSBPE adopted rules require that TSBPE licensed plumbing inspectors perform plumbing inspections of all new plumbing and alterations or additions to existing plumbing within the municipal limits of all cities, towns, and villages which have passed an ordinance adopting one of the plumbing codes recognized by TSBPE. Such entities may stipulate that the customer service inspection be performed by the plumbing inspector as a part of the more comprehensive plumbing inspection. Where such entities permit customer service inspectors to perform customer service inspections, the customer service inspector shall report any violations immediately to the local entity's plumbing inspection department.

(k) Interconnection. No physical connection between the distribution system of a public drinking water supply and that of any other water supply shall be permitted

unless the other water supply is of a safe, sanitary quality and the interconnection is approved by the executive director.

(l) Flushing of mains. All dead-end mains must be flushed at monthly intervals. Dead-end lines and other mains shall be flushed as needed if water quality complaints are received from water customers or if disinfectant residuals fall below acceptable levels as specified in §290.110 of this title.

(m) Maintenance and housekeeping. The maintenance and housekeeping practices used by a public water system shall ensure the good working condition and general appearance of the system's facilities and equipment. The grounds and facilities shall be maintained in a manner so as to minimize the possibility of the harboring of rodents, insects, and other disease vectors, and in such a way as to prevent other conditions that might cause the contamination of the water.

(1) Each of the system's ground, elevated, and pressure tanks shall be inspected annually by water system personnel or a contracted inspection service.

(A) Ground and elevated storage tank inspections must determine that the vents are in place and properly screened, the roof hatches closed and locked, flap valves and gasketing provide adequate protection against insects, rodents, and other vermin, the interior and exterior coating systems are continuing to provide adequate protection to all metal surfaces, and the tank remains in a watertight condition.

(B) Pressure tank inspections must determine that the pressure release device and pressure gauge are working properly, the air-water ratio is being maintained at the proper level, the exterior coating systems are continuing to provide adequate protection to all metal surfaces, and the tank remains in watertight condition. Pressure tanks provided with an inspection port must have the interior surface inspected every five years.

(C) All tanks shall be inspected annually to determine that instrumentation and controls are working properly.

(2) When pressure filters are used, a visual inspection of the filter media and internal filter surfaces shall be conducted annually to ensure that the filter media is in good condition and the coating materials continue to provide adequate protection to internal surfaces.

(3) When cartridge filters are used, filter cartridges shall be changed at the frequency required by the manufacturer, or more frequently if needed.

(4) All water treatment units, storage and pressure maintenance facilities, distribution system lines, and related appurtenances shall be maintained in a watertight condition and be free of excessive solids.

(5) Basins used for water clarification shall be maintained free of excessive solids to prevent possible carryover of sludge and the formation of tastes and odors.

(6) Pumps, motors, valves, and other mechanical devices shall be maintained in good working condition.

(7) Reverse osmosis or nanofiltration membrane systems shall be cleaned, or replaced, in accordance with the allowable operating conditions of the manufacturer and shall be based on one or more of the following: increased salt passage, increased or decreased pressure differential, and/or change in normalized permeate flow.

(n) Engineering plans and maps. Plans, specifications, maps, and other pertinent information shall be maintained to facilitate the operation and maintenance of the system's facilities and equipment. The following records shall be maintained on file at the public water system and be available to the executive director upon request.

(1) Accurate and up-to-date detailed as-built plans or record drawings and specifications for each treatment plant, pump station, and storage tank shall be maintained at the public water system until the facility is decommissioned. As-built plans of individual projects may be used to fulfill this requirement if the plans are maintained in an organized manner.

(2) An accurate and up-to-date map of the distribution system shall be available so that valves and mains can be easily located during emergencies.

(3) Copies of well completion data as defined in §290.41(c)(3)(A) of this title (relating to Water Sources) [such as well material setting data, geological log, sealing information (pressure cementing and surface protection), disinfection information, microbiological sample results, and a chemical analysis report of a representative sample of water from the well] shall be kept on file for as long as the well remains in service.

(o) Filter backwashing at surface water treatment plants. Filters must be backwashed when a loss of head differential of six to ten feet is experienced between the influent and effluent loss of head gauges or when the turbidity level at the effluent of the filter reaches 1.0 nephelometric turbidity unit (NTU).

(p) Data on public water system ownership and management. The agency shall be provided with information regarding public water system ownership and management.

(1) When a public water system changes ownership, a written notice of the transaction must be provided to the executive director. The grantee shall notify the executive director of the change in ownership within 30 days after the effective date of the change in ownership by providing the name of the grantor, the effective date of the change in ownership, the physical and mailing address and phone number of the grantee, the public water system's drinking water supply identification number, and any other

information necessary to identify the transaction [When applicable, notification shall be in accordance with Chapter 291 of this title (relating to Utility Regulations). Those systems not subject to Chapter 291 of this title shall notify the executive director of changes in ownership by providing the name of the current and prospective owner or responsible official, the proposed date of the transaction, and the address and phone number of the new owner or responsible official. The information listed in this paragraph and the system's public drinking water supply identification number, and any other information necessary to identify the transaction shall be provided to the executive director 120 days before the date of the transaction].

(2) On an annual basis, the owner of a public water system shall provide the executive director with a list of all the operators and operating companies that the public water system uses. The notice shall contain the name, contact information, work status, license number, and license class of each operator and the name and registration number of each operating company. Public water systems may report the list of operators and operating companies to the executive director by utilizing the Texas Commission on Environmental Quality (TCEQ) online "Operator Notice" form. If reporting cannot be accomplished utilizing the TCEQ online "Operator Notice" form, then a public water system may report the list of operators and operating companies on the written "Operator Notice" form to the executive director by mail, email or facsimile. (See §290.47(d) of this title).

(q) Special precautions, protective measures, and boil water notices. Special precautions, protective measures, and boil water notices shall [must] be instituted by the public water system [owner or responsible official] in the event of low distribution pressures (below 20 pounds per square inch (psi)), water outages, microbiological samples found to contain *Escherichia coli* (*E. coli*) (or other approved fecal indicator) [coliform organisms], failure to maintain adequate disinfectant [chlorine] residuals, elevated finished water turbidity levels, or other conditions which indicate that the potability of the drinking water supply has been compromised. Special precautions, protective measures, and boil water notices are corrective or protective actions which shall be instituted by the public water system to comply with the requirements of this subsection.

(1) Boil water notices and rescind notices. A public water system shall issue a boil water notice to customers throughout the distribution system or in the affected area(s) of the distribution system as soon as possible, but in no case later than 24 hours after the public water system has met any of the criteria described in paragraphs (2) - (5) of this subsection. Boil water notices shall be issued to customers by using one or more of the Tier 1 delivery methods as described in §290.122(a)(2) of this title (relating to Public Notification) and using the applicable boil water notice language and format specified in Figure: 30 TAC §290.47(c)(1) and (2) of this title [Boil water notifications must be issued to the customers within 24 hours using the prescribed notification format as specified in §290.47(c) of this title]. A copy of this notice shall be provided to the executive director within 24 hours or no later than the next business day after issuance by the public water system and shall be accompanied with a signed Certificate of

Delivery. The boil water notice shall be multilingual where [Bilingual notification may be] appropriate based upon local demographics. Once the boil water notice [notification] is no longer in effect, the public water system shall notify customers throughout the distribution system or in the affected area(s) of the distribution system that the boil water notice has been rescinded using the language and format specified in Figure: 30 TAC §290.47(c)(3) of this title [must be notified in a manner similar to the original notice]. A public water system shall not rescind a boil water notice and/or notify customers that the boil water notice has been rescinded until the public water system has met all of the applicable requirements as described in paragraph (6) of this subsection.

(2) Boil water notices for low distribution pressures. The flowchart found in §290.47(e) of this title shall be used to determine if a boil water notice shall [notification must] be issued by the public water system to customers in the event of a loss of distribution system pressure. [If a boil water notice is issued under this section, it shall remain in effect until water distribution pressures in excess of 20 psi can consistently be maintained, a minimum of 0.2 mg/L free chlorine residual or 0.5 mg/L chloramine residual (measured as total chlorine) is present throughout the system, and water samples collected for microbiological analysis are found negative for coliform organisms.]

(3) Boil water notices for *E. coli* (or other approved fecal indicator) maximum contaminant level (MCL) violations. A public water system shall issue a boil water notice

to customers for a violation of the MCL for *E. coli* (or other approved fecal indicator) as described in §290.109(b)(1) of this title.

(4) [(3)] Boil water notices for turbidity requirements. A public water system shall issue a boil water notice to customers [notification shall be issued] if the combined filter effluent turbidity of the finished water, produced by a treatment plant that is treating surface water or groundwater under the direct influence of surface water, is above the turbidity level requirements as described in §290.122(a)(1)(B) of this title, specifically: [surface water treatment plant exceeds 5.0 NTU. The boil water notice shall remain in effect until the water entering the distribution system has a turbidity level below 1.0 NTU, the distribution system has been thoroughly flushed, a minimum of 0.2 mg/L free chlorine residual or 0.5 mg/L chloramine residual (measured as total chlorine) is present throughout the system, and water samples collected for microbiological analysis are found negative for coliform organisms.]

(A) a combined filter effluent turbidity level above 5.0 NTU;

(B) a combined filter effluent turbidity level above 1.0 NTU at a treatment plant using membrane filters;

(C) a combined filter effluent turbidity level above 1.0 NTU at a plant using other than membrane filters at the discretion of the executive director after consultation with the public water system; or

(D) failure of a public water system with treatment other than membrane filters to consult with the executive director within 24 hours after a combined filter effluent reading of 1.0 NTU.

(5) [(4) Other] Actions which may be required by the executive director. Special precautions, protective measures, and boil water notices may be required at the discretion of the executive director and shall be instituted by the public water system, upon written notification to the public water system, and shall remain in effect until the public water system meets the requirements of subparagraph (C) of this paragraph and paragraph (6) of this subsection.

(A) At the discretion of the executive director, and upon notification, a public water system shall institute special precautions, protective measures, and boil water notices as described under this subsection. Circumstances warranting the exercise of such discretion may include:

(i) the public water system has failed to provide required compliance information to the executive director as described in §290.110(e) and §290.111(h) of this title and the failure results in the inability of the executive director to determine compliance as described in §290.110(f) and §290.111(i) of this title;

(ii) special precautions, protective measures, and/or boil water notices are necessary to comply with the requirements of this title to prevent or correct a potential or actual health hazard, as described in §290.38 of this title, to public water system customers; or

(iii) the public water system has failed to maintain adequate disinfectant residuals as described in subsection (d) of this section and as described in §290.110 of title.

(B) The executive director will provide written notification to the public water system in the event a public water system is required to institute special precautions, protective measures, or issue boil water notices to customers at the discretion of the executive director. Upon receipt of written notification by the executive director, the public water system shall implement special precautions, protective measures, or issue boil water notices to customers within 24 hours or within the time period specified by the executive director.

(C) At the discretion of the executive director, the public water system shall provide any required information to the executive director to document that the public water system has met the requirements for special precautions, protective measures, and boil water notices as required under this paragraph.

(6) Required actions prior to rescinding a boil water notice. A public water system shall notify customers throughout the distribution system or in the affected area(s) of the distribution system that a boil water notice has been rescinded after the public water system has met the requirements of this paragraph. The executive director may provide written notification to the public water system once the public water system has provided required compliance documentation to the executive director. A boil water notice issued under the requirements of this subsection shall remain in effect until the public water system has provided required compliance documentation to the executive director which establishes that the public water system has met the following requirements, as applicable:

(A) water distribution system pressures in excess of 20 psi are consistently being maintained throughout the distribution system in accordance with the flowchart found in §290.47(e) of this title;

(B) affected area(s) of the distribution system have been thoroughly flushed until a minimum of 0.2 mg/L free chlorine residual or 0.5 mg/L chloramine residual (measured as total chlorine) is present and is consistently being maintained in each finished water storage tank and throughout the distribution system as described in subsection (d) of this section;

(C) finished water entering the distribution system, produced by a treatment plant that is treating surface water or groundwater under the direct influence

of surface water, has a turbidity level that is consistently being maintained below 1.0 NTU;

(D) actions required by the executive director under paragraph (5) of this subsection have been met and the public water system is operating in accordance with §290.110(e) and (f) and §290.111(h) and (i) of this title as described in paragraph (5)(A)(i) of this subsection; and

(E) water samples for microbiological analysis, marked as "special" on the laboratory sample submission form, were collected from representative locations throughout the distribution system or in the affected area(s) of the distribution system within 24 hours or no later than the next business day once the public water system has met all other applicable requirements of this paragraph and the water samples collected for microbiological analysis are found negative for coliform organisms. The water samples described in this subparagraph shall be analyzed at laboratories in accordance with §290.119 of this title (relating to Analytical Procedures).

(F) A public water system shall notify customers throughout the distribution system or in the affected area(s) of the distribution system that a boil water notice has been rescinded within 24 hours or no later than the next business day, using the language and format specified in Figure: 30 TAC §290.47(c)(3) of this title, once the public water system has met the requirements of this paragraph. The public water system shall provide a copy of the "boil water notice rescinded" notice and a copy of the

associated microbiological laboratory analysis results, as required by subparagraph (E) of this paragraph, to the executive director within ten days after the public water system has issued the rescind notice to customers in accordance with §290.122(f) of this title.

(r) Minimum pressures. All public water systems shall be operated to provide a minimum pressure of 35 psi throughout the distribution system under normal operating conditions. The system shall also be operated to maintain a minimum pressure of 20 psi during emergencies such as fire fighting. As soon as safe and practicable following the occurrence of a natural disaster, a public water system that is an affected utility shall maintain a minimum of 35 psi throughout the distribution system during an extended power outage.

(s) Testing equipment. Accurate testing equipment or some other means of monitoring the effectiveness of any chemical treatment or pathogen inactivation or removal processes must be used by the system.

(1) Flow-measuring devices and rate-of-flow controllers that are required by §290.42(b) and (d) of this title (relating to Water Treatment) shall be calibrated at least once every 12 months. Well meters required by §290.41(c)(3)(N) of this title [(relating to Water Sources)] shall be calibrated at least once every three years.

(2) Laboratory equipment used for compliance testing shall be properly calibrated.

(A) pH meters shall be properly calibrated.

(i) Benchtop pH meters shall be calibrated according to manufacturer [manufacturers] specifications at least once each day.

(ii) The calibration of benchtop pH meters shall be checked with at least one buffer each time a series of samples is run, and if necessary, recalibrated according to manufacturer [manufacturers] specifications.

(iii) On-line pH meters shall be calibrated according to manufacturer specifications at least once every 30 days.

(iv) The calibration of on-line pH meters shall be checked at least once each week with a primary standard or by comparing the results from the on-line unit with the results from a properly calibrated benchtop unit. If necessary, the on-line unit shall be recalibrated with primary standards.

(B) Turbidimeters shall be properly calibrated.

(i) Benchtop turbidimeters shall be calibrated with primary standards at least once every 90 days. Each time the turbidimeter is calibrated with primary standards, the secondary standards shall be restandardized.

(ii) The calibration of benchtop turbidimeters shall be checked with secondary standards each time a series of samples is tested, and if necessary, recalibrated with primary standards.

(iii) On-line turbidimeters shall be calibrated with primary standards at least once every 90 days.

(iv) The calibration of on-line turbidimeters shall be checked at least once each week with a primary standard, a secondary standard, or the manufacturer's proprietary calibration confirmation device or by comparing the results from the on-line unit with the results from a properly calibrated benchtop unit. If necessary, the on-line unit shall be recalibrated with primary standards.

(C) Chemical disinfectant residual analyzers shall be properly calibrated.

(i) The accuracy of manual disinfectant residual analyzers shall be verified at least once every 90 days using chlorine solutions of known concentrations.

(ii) The accuracy of continuous disinfectant residual analyzers shall be checked at least once every seven days with a chlorine solution of known concentration or by comparing the results from the on-line analyzer with the result of

approved benchtop method in accordance with §290.119 of this title [(relating to Analytical Procedures)].

(iii) If a disinfectant residual analyzer produces a result which is not within 15% of the expected value, the cause of the discrepancy must be determined and corrected and, if necessary, the instrument must be recalibrated.

(D) Analyzers used to determine the effectiveness of chloramination in §290.110(c)(5) of this title shall be properly verified in accordance with the manufacturer's recommendations every 90 days. These analyzers include monochloramine, ammonia, nitrite, and nitrate equipment used by the public water system.

(E) Ultraviolet (UV) light disinfection analyzers shall be properly calibrated.

(i) The accuracy of duty UV sensors shall be verified with a reference UV sensor monthly, according to the UV sensor manufacturer.

(ii) The reference UV sensor shall be calibrated by the UV sensor manufacturer on a yearly basis, or sooner if needed.

(iii) If used, the UV Transmittance (UVT) analyzer shall be calibrated weekly according to the UVT analyzer manufacturer specifications.

(F) Systems must verify the performance of direct integrity testing equipment in a manner and schedule approved by the executive director.

(G) Conductivity (or total dissolved solids) monitors and pressure instruments used for reverse osmosis and nanofiltration membrane systems shall be calibrated at least once every 12 months.

(H) Any temperature monitoring devices used for reverse osmosis and nanofiltration shall be verified and calibrated in accordance with the manufacturer's specifications.

(t) System ownership. All community water systems shall post a legible sign at each of its production, treatment, and storage facilities. The sign shall be located in plain view of the public and shall provide the name of the water supply and an emergency telephone number where a responsible official can be contacted.

(u) Abandoned wells. Abandoned public water supply wells owned by the system must be plugged with cement according to 16 TAC Chapter 76 (relating to Water Well Drillers and Water Well Pump Installers). Wells that are not in use and are non-deteriorated as defined in those rules must be tested every five years or as required by

the executive director to prove that they are in a non-deteriorated condition. The test results shall be sent to the executive director for review and approval. Deteriorated wells must be either plugged with cement or repaired to a non-deteriorated condition.

(v) Electrical wiring. All water system electrical wiring must be securely installed in compliance with a local or national electrical code.

(w) Security. All systems shall maintain internal procedures to notify the executive director by a toll-free reporting phone number immediately of the following events, if the event may negatively impact the production or delivery of safe and adequate drinking water:

(1) an unusual or unexplained unauthorized entry at property of the public water system;

(2) an act of terrorism against the public water system;

(3) an unauthorized attempt to probe for or gain access to proprietary information that supports the key activities of the public water system;

(4) a theft of property that supports the key activities of the public water system; or

(5) a natural disaster, accident, or act that results in damage to the public water system.

(x) Public safety standards. This subsection only applies to a municipality with a population of 1,000,000 or more, with a public utility within its corporate limits; a municipality with a population of more than 36,000 and less than 41,000 located in two counties, one of which is a county with a population of more than 1.8 million; a municipality, including any industrial district within the municipality or its extraterritorial jurisdiction (ETJ), with a population of more than 7,000 and less than 30,000 located in a county with a population of more than 155,000 and less than 180,000; or a municipality, including any industrial district within the municipality or its ETJ, with a population of more than 11,000 and less than 18,000 located in a county with a population of more than 125,000 and less than 230,000.

(1) In this subsection:

(A) "Regulatory authority" means, in accordance with the context in which it is found, either the commission or the governing body of a municipality.

(B) "Public utility" means any person, corporation, cooperative corporation, affected county, or any combination of these persons or entities, other than a municipal corporation, water supply or sewer service corporation, or a political subdivision of the state, except an affected county, or their lessees, trustees, and

receivers, owning or operating for compensation in this state equipment or facilities for the transmission, storage, distribution, sale, or provision of potable water to the public or for the resale of potable water to the public for any use or for the collection, transportation, treatment, or disposal of sewage or other operation of a sewage disposal service for the public, other than equipment or facilities owned and operated for either purpose by a municipality or other political subdivision of this state or a water supply or sewer service corporation, but does not include any person or corporation not otherwise a public utility that furnishes the services or commodity only to itself or its employees or tenants as an incident of that employee service or tenancy when that service or commodity is not resold to or used by others.

(C) "Residential area" means:

(i) an area designated as a residential zoning district by a governing ordinance or code or an area in which the principal land use is for private residences;

(ii) a subdivision for which a plat is recorded in the real property records of the county and that contains or is bounded by public streets or parts of public streets that are abutted by residential property occupying at least 75% of the front footage along the block face; or

(iii) a subdivision a majority of the lots of which are subject to deed restrictions limiting the lots to residential use.

(D) "Industrial district" has the meaning assigned by Texas Local Government Code, §42.044, and includes an area that is designated by the governing body of a municipality as a zoned industrial area.

(2) When the regulatory authority is a municipality, it shall by ordinance adopt standards for installing fire hydrants in residential areas in the municipality. These standards must, at a minimum, follow current AWWA standards pertaining to fire hydrants and the requirements of §290.44(e)(6) of this title.

(3) When the regulatory authority is a municipality, it shall by ordinance adopt standards for maintaining sufficient water pressure for service to fire hydrants adequate to protect public safety in residential areas in the municipality. The standards specified in paragraph (4) of this subsection are the minimum acceptable standards.

(4) A public utility shall deliver water to any fire hydrant connected to the public utility's water system located in a residential area so that the flow at the fire hydrant is at least 250 gallons per minute for a minimum period of two hours while maintaining a minimum pressure of 20 psi throughout the distribution system during emergencies such as fire fighting. That flow is in addition to the public utility's maximum daily demand for purposes other than fire fighting.

(5) When the regulatory authority is a municipality, it shall adopt the standards required by this subsection within one year of the effective date of this subsection or within one year of the date this subsection first applies to the municipality, whichever occurs later.

(6) A public utility shall comply with the standards established by a municipality under both paragraphs (2) and (3) of this subsection within one year of the date the standards first apply to the public utility. If a municipality has failed to comply with the deadline required by paragraph (5) of this subsection, then a public utility shall comply with the standards specified in paragraphs (2) and (4) of this subsection within two years of the effective date of this subsection or within one year of the date this subsection first applies to the public utility, whichever occurs later.

(y) Fire hydrant flow standards.

(1) In this subsection:

(A) "Municipal utility" means a retail public utility, as defined by Texas Water Code (TWC), §13.002, that is owned by a municipality.

(B) "Residential area" means an area used principally for private residences that is improved with at least 100 single-family homes and has an average density of one home per half acre.

(C) "Utility" includes a "public utility" and "water supply or sewer service corporation" as defined by TWC, §13.002.

(2) The governing body of a municipality by ordinance may adopt standards set by the executive director requiring a utility to maintain a minimum sufficient water flow and pressure to fire hydrants in a residential area located in the municipality or the municipality's ETJ. The municipality must submit a signed copy of the ordinance to the executive director within 60 days of the adoption of an ordinance by its governing body.

(3) In addition to a utility's maximum daily demand, the utility must provide, for purposes of emergency fire suppression:

(A) a minimum sufficient water flow of at least 250 gallons per minute for at least two hours; and

(B) a minimum sufficient water pressure of at least 20 psi.

(4) If a municipality adopts standards for a minimum sufficient water flow and pressure to fire hydrants, the municipality must require a utility to maintain at least the minimum sufficient water flow and pressure described by paragraph (3) of this subsection in fire hydrants in a residential area located within the municipality or the

municipality's ETJ. If the municipality adopts a fire flow standard exceeding the minimum standards set in paragraph (3) of this subsection, the standard adopted by the municipality must be based on:

(A) the density of connections;

(B) service demands; and

(C) other relevant factors.

(5) If the municipality owns a municipal utility, it may not require another utility located in the municipality or the municipality's ETJ to provide water flow and pressure in a fire hydrant greater than that provided by the municipal utility as determined by the executive director.

(6) If the municipality does not own a municipal utility, it may not require a utility located in the municipality or the municipality's ETJ to provide a minimum sufficient water flow and pressure greater than the standard established by paragraph (3) of this subsection.

(7) An ordinance under paragraph (2) of this subsection may not require a utility to build, retrofit, or improve infrastructure in existence at the time the ordinance is adopted.

(8) A municipality with a population of less than 1.9 million that adopts standards under paragraph (2) of this subsection or that seeks to use a utility's water for emergency fire suppression shall enter into a written memorandum of understanding with the utility.

(A) The memorandum of understanding must provide for:

(i) the necessary testing of fire hydrants; and

(ii) other relevant issues pertaining to the use of the water and maintenance of the fire hydrants to ensure compliance with this subsection.

(B) The municipality must submit a signed copy of the memorandum of understanding to the executive director within 60 days of the execution of the memorandum of understanding between its governing body and the utility.

(9) A municipality may notify the executive director of a utility's failure to comply with a standard adopted under paragraph (3) of this subsection.

(10) On receiving the notice described by paragraph (9) of this subsection, the executive director shall require a utility in violation of a standard adopted under this subsection to comply within a reasonable time established by the executive director.

(z) Nitrification Action Plan (NAP). Any water system distributing chloraminated water must create a NAP. The system must create a written NAP that:

(1) contains the system-specific plan for monitoring free ammonia, monochloramine, total chlorine, nitrite, and nitrate levels;

(2) contains system-specific action levels of the above monitored chemicals where action must be taken;

(3) contains specific corrective actions to be taken if the action levels are exceeded; and

(4) is maintained as part of the system's monitoring plan in §290.121 of this title.

§290.47. Appendices.

(a) Appendix A. Recognition as a Superior or Approved Public Water System.

Figure: 30 TAC §290.47(a) (No change to the figure as it currently exists in TAC.)

APPENDIX A

Requirements. Public water supply systems which achieve and maintain recognition must exceed the minimum acceptable standards of the commission in these sections.

(1) To attain recognition as a "Superior Public Water System", the following additional requirements must be met:

(A) Physical facilities shall comply with the requirements in these sections.

(B) There shall be a minimum of two licensed operators with additional operators required for larger systems.

(C) The system's microbiological record for the previous 24 months period shall indicate no violations (frequency, number or maximum contaminant level) of the drinking water standards.

(D) The quality of the water shall comply with all primary water quality parameters listed in the drinking water standards.

(E) The chemical quality of the water shall comply with all secondary constituent levels listed in the drinking water standards.

(F) The system's operation shall comply with applicable state statutes and minimum acceptable operating practices set forth in §290.46 of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

(G) The system's capacities shall meet or exceed minimum water system capacity requirements set forth in §290.45 of this title (relating to Minimum Water System Capacity Requirements).

(H) The system shall have at least two wells, two raw water pumps or a combination of these with enough capacity to provide average daily consumption with the largest well or pump out of service. This requirement shall also apply to treatment plant pumps necessary for operation in accordance with §290.42 of this title (relating to Water Treatment).

(I) The water system shall be well maintained and the facilities shall present a pleasing appearance to the public.

(2) To attain recognition as an "Approved Public Water System," all additional requirements listed under subsection (a)(1) of this section with exception of secondary constituents, subsection (a)(1)(E) of this section must be met. Public water systems which provide water quality that exceeds the secondary chemical standards may be excluded from this recognition program at the discretion of the executive director.

Signs. Systems which have met the requirements for recognition as a superior or approved system may erect signs denoting this honor.

Inspections. To receive or maintain recognition as a superior or approved water system, the system must be inspected and evaluated by commission personnel as to physical facilities, appearance and operation. Systems which fail to meet the above requirements in this section will be denied recognition or will have their recognition revoked. The signs shall be immediately removed on notice from the executive director.

(b) Appendix B. Sample Retail Service Agreement.

Figure: 30 TAC §290.47(b) (No change to the figure as it currently exists in TAC.)

Appendix B: Sample Retail Service Agreement

I. PURPOSE. The NAME OF WATER SYSTEM is responsible for protecting the drinking water supply from contamination or pollution which could result from improper system construction or configuration on the retail connection owner's side of the meter. The purpose of this service agreement is to notify each customer of the restrictions which are in place to provide this protection. The public water system enforces these restrictions to ensure the public health and welfare. Each retail customer must sign this agreement before the NAME OF WATER SYSTEM will begin service. In addition, when service to an existing retail connection has been suspended or terminated, the water system will not re-establish service unless it has a signed copy of this agreement.

II. RESTRICTIONS. The following unacceptable practices are prohibited by State regulations.

A. No direct connection between the public drinking water supply and a potential source of contamination is permitted. Potential sources of

contamination shall be isolated from the public water system by an air-gap or an appropriate backflow prevention device.

B. No cross-connection between the public drinking water supply and a private water system is permitted. These potential threats to the public drinking water supply shall be eliminated at the service connection by the installation of an air-gap or a reduced pressure-zone backflow prevention device.

C. No connection which allows water to be returned to the public drinking water supply is permitted.

D. No pipe or pipe fitting which contains more than 0.25% lead may be used for the installation or repair of plumbing at any connection which provides water for human use.

E. No solder or flux which contains more than 0.2% lead can be used for the installation or repair of plumbing at any connection which provides water for human use.

III. SERVICE AGREEMENT. The following are the terms of the service agreement between the NAME OF WATER SYSTEM (the Water System) and NAME OF CUSTOMER (the Customer).

A. The Water System will maintain a copy of this agreement as long as the Customer and/or the premises is connected to the Water System.

B. The Customer shall allow his property to be inspected for possible cross-connections and other potential contamination hazards. These inspections shall be conducted by the Water System or its designated agent prior to initiating new water service; when there is reason to believe that cross-connections or other potential contamination hazards exist; or after any major changes to the private water distribution facilities. The inspections shall be conducted during the Water System's normal business hours.

C. The Water System shall notify the Customer in writing of any cross-connection or other potential contamination hazard which has been identified during the initial inspection or the periodic reinspection.

D. The Customer shall immediately remove or adequately isolate any potential cross-connections or other potential contamination hazards on his premises.

E. The Customer shall, at his expense, properly install, test, and maintain any backflow prevention device required by the Water System. Copies of all testing and maintenance records shall be provided to the Water System.

IV. ENFORCEMENT. If the Customer fails to comply with the terms of the Service Agreement, the Water System shall, at its option, either terminate service or properly install, test, and maintain an appropriate backflow prevention device at the service connection. Any expenses associated with the enforcement of this agreement shall be billed to the Customer.

CUSTOMER'S
SIGNATURE:_____

DATE:_____

(c) Appendix C. Boil Water Notices [Notification].

(1) Appendix (c)(1): Boil Water Notice for Community Public Water Systems.

Figure: 30 TAC §290.47(c)(1)

[Figure: 30 TAC §290.47(c)]

Appendix (c)(1)[C]: Boil Water Notice for Community Public Water Systems [Notification]
<Date>

Due to <**See Instruction 1**> [conditions which have occurred recently in the water system], the Texas Commission on Environmental Quality has required the <**See Instruction 2**> public water system to notify all customers to boil their water prior to consumption.

To ensure destruction of all harmful bacteria and other microbes, water for drinking, cooking, and ice making should be boiled and cooled prior to use for drinking water or human consumption purposes. The water should be brought to a vigorous rolling boil and then boiled for two minutes.

In lieu of boiling, individuals [you] may purchase bottled water or obtain water from some other suitable source for drinking water or human consumption purposes.

When it is no longer necessary to boil the water, the public water system officials will notify customers [you] that the water is safe for drinking water or human consumption purposes.

Once the boil water notice is no longer in effect, the public water system will issue a notice to customers that rescinds the boil water notice in a manner similar to this notice.

If you have questions concerning (regarding) this matter, you may contact < **See Instruction 3**> at < **See Instruction 4**> [<**Water System Official(s)**>at <**Official's Telephone Number(s)**>].

Instructions:
Delete instructions below on copy given to customers.

This is the mandatory language for your "Boil Water Notice". Please replace all of the above referenced < **See Instruction**> numbers with the information as follows:

<1> A description of the conditions that require a "Boil Water Notice" to be issued for the public water system that may include but are not limited to: reduced distribution system pressure, line break, low disinfection residuals, etc.

<2> Public Water System Name / Public Water System Identification Number

<3> Name of public water system official and any other primary contact names. **(Do not list TCEQ as the primary contact.)**

<4> Public water system official(s) phone number and any other useful contact numbers.

The public water system customers and the executive director shall be able to reach the public water system at one of the numbers listed in this notice.

If a customer wishes to contact the executive director, please call (512) 239-4691.

[1. List more than one water system official and phone number.]

[2. Do not list the commission as the primary contact.]

[3. If a customer wishes to call the Texas Commission on Environmental Quality, please have them call (512) 239-4691.]

(2) Appendix (c)(2): Boil Water Notice for Noncommunity Public Water Systems.

Figure: 30 TAC §290.47(c)(2)

Appendix (c)(2): Boil Water Notice for Noncommunity Public Water Systems

<Date>

Due to <**See Instruction 1**>, the Texas Commission on Environmental Quality has required the <**See Instruction 2**> public water system to notify all customers, individuals, or employees that this establishment or business has implemented a boil water notice. All water provided by this establishment or business shall be boiled prior to use for drinking water or human consumption purposes prior to consumption.

To ensure destruction of all harmful bacteria and other microbes, water for drinking, cooking, and ice making should be boiled and cooled prior to use for drinking water or human consumption purposes. The water should be brought to a vigorous rolling boil and then boiled for two minutes.

In lieu of boiling, all customers, individuals, or employees may purchase bottled water or obtain water from some other suitable source for drinking water or human consumption purposes.

When it is no longer necessary to boil the water, the public water system officials of this establishment or business will notify customers, individuals, or employees that the water is safe for drinking water or human consumption purposes. Once the boil water notice is no longer in effect, the public water system officials will issue a notice to customers, individuals, or employees of this establishment or business that rescinds the boil water notice in a manner similar to this notice.

If you have questions concerning (regarding) this matter, you may contact < **See Instruction 3**> at < **See Instruction 4**>.

Instructions:

Delete instructions below on copy given to customers.
This is the mandatory language for your "Boil Water Notice". Please replace all of the above referenced < **See Instruction**> numbers with the information as follows:

<1> A description of the conditions that require a "Boil Water Notice" to be issued for the public water system that may include but are not limited to (e.g., reduced distribution system pressure, line break, low disinfection residuals, etc.).

<2> Public Water System Name / Public Water System Identification Number

<3> Name of public water system official and any other primary contact names.
(Do not list TCEQ as the primary contact.)

<4> Public water system official(s) phone number and any other useful contact numbers.

The public water system customers and the executive director shall be able to reach the public water system at one of the numbers listed in this notice.

If a customer wishes to contact the executive director, please call (512) 239-4691.

(3) Appendix (c)(3): Boil Water Notice Rescinded.

Figure: 30 TAC §290.47(c)(3)

Appendix (c)(3): Boil Water Notice Rescinded
<Date>

On <**See Instruction 1**>, the Texas Commission on Environmental Quality (TCEQ) required the <**See Instruction 2**> public water system, <**See Instruction 3**>, to issue a Boil Water Notice to inform customers, individuals, or employees that due to conditions which occurred recently in the public water system, the water from this public water system was required to be boiled prior to use for drinking water or human consumption purposes.

The public water system has taken the necessary corrective actions to restore the quality of the water distributed by this public water system used for drinking water or human consumption purposes and has provided TCEQ with laboratory test results that indicate that the water no longer requires boiling prior to use as of < **See Instruction 4**>.

If you have questions, please contact < **See Instruction 5**> at < **See Instruction 6**>.
If a customer, individual, or employee wishes to contact TCEQ, please call (512) 239-4691.

Instructions:
Delete instructions below on copy given to customers.
This is the mandatory language for your "Boil Water Notice Rescinded" notice. Please replace all of the above referenced < **See Instruction**> numbers with the information as follows:

<1> Insert date that the initial Boil Water Notice was issued.

<2> Public Water System Name.

<3> Public Water System Identification Number.

<4> Boil Water Notice Rescind Date.

<5> Name of public water system official and any other primary contact names.
(Do not list TCEQ as the primary contact.)

<6> Public water system official(s) phone number and any other useful contact numbers.

(d) Appendix D. Operator Notice.

Figure: 30 TAC §290.47(d) (No change to the figure as it currently exists in TAC.)

30 TAC §290.46(p)(2), Data on water system ownership and management, requires the owner of a public water system to annually provide the executive director with a list of all the water works operators and operating companies that the public water system uses. The following form may be used to facilitate compliance with this requirement. This notice shall be submitted to the Texas Commission on Environmental Quality (TCEQ), Water Supply Division, MC-155, P.O. Box 13087, Austin, Texas 78711-3087 or via the TCEQ online "Operator Notice" form. Upon request, the "Operator Notice" form shall also be provided to the executive director during on-site inspections.

Appendix D: Operator Notice

Name of Operator or Operating Company	For Operators				For Companies
	Contact Information	Full, Part-time or Volunteer	License No.	Class of License	Registration No.
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					

10.					

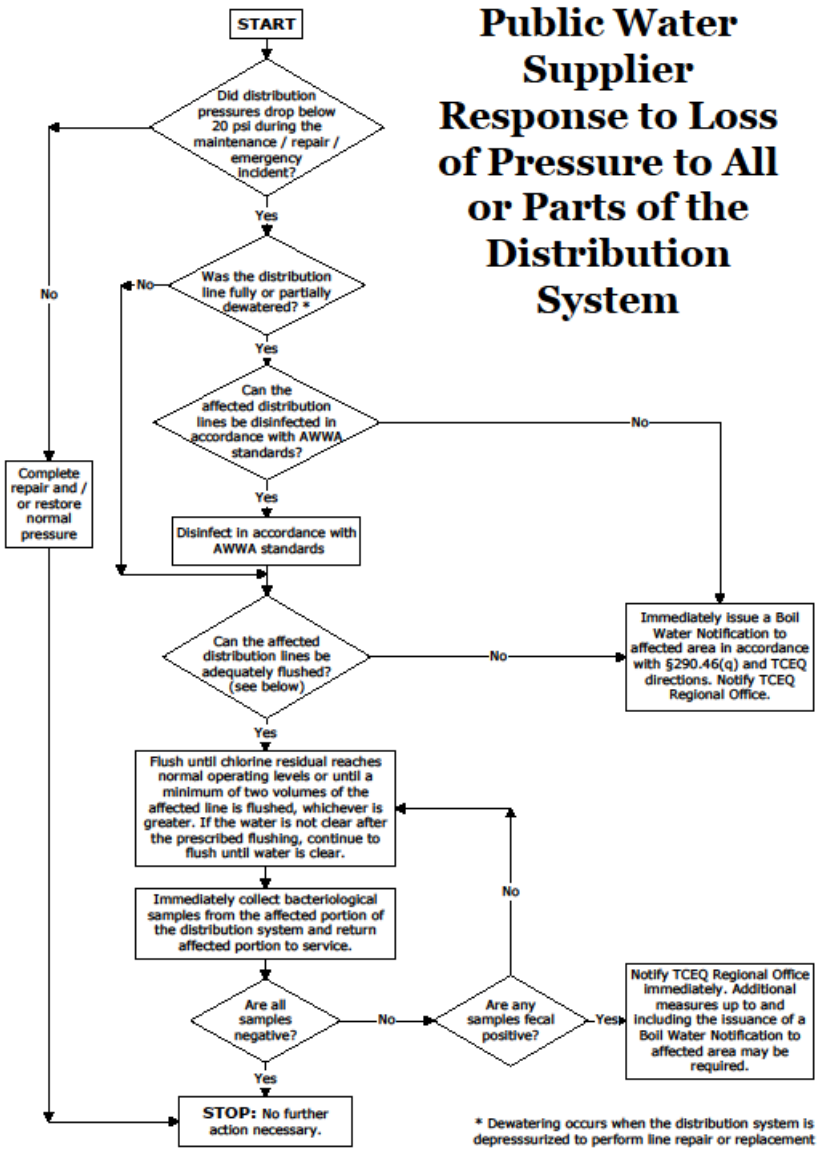
_____
Signature of Water System Owner or Responsible / Official Date

_____
Name of Water System Owner or Responsible Official / Title of Owner or Responsible Official

(e) Appendix E. Special Precautions.

Figure: 30 TAC §290.47(e) (No change to the figure as it currently exists in TAC.)

Figure: 30 TAC §290.47(e)



(f) Appendix F. Assessment of Hazards and Selection of Assemblies.

Figure: 30 TAC §290.47(f) (No change to the figure as it currently exists in TAC.)

Appendix F: Assessment of Hazards and Selection of Assemblies

The following table lists many common hazards. It is not an all-inclusive list of the hazards which may be found connected to public water systems.

Premises Isolation: Description of Premises	Assessment of Hazard	Required Assembly
Aircraft and missile plants	Health	RPBA or AG
Animal feedlots	Health	RPBA or AG
Automotive plants	Health	RPBA or AG
Breweries	Health	RPBA or AG
Canneries, packing houses and rendering plants	Health	RPBA or AG
Commercial car wash facilities	Health	RPBA or AG
Commercial laundries	Health	RPBA or AG
Cold storage facilities	Health	RPBA or AG
Connection to sewer pipe	Health	RPBA or AG
Dairies	Health	RPBA or AG
Docks and dockside facilities	Health	RPBA or AG
Dye works	Health	RPBA or AG
Food and beverage processing plants	Health	RPBA or AG
Hospitals, morgues, mortuaries, medical clinics, dental clinics, veterinary clinics, autopsy facilities, sanitariums, and medical labs	Health	RPBA or AG
Metal manufacturing, cleaning, processing, and fabrication plants	Health	RPBA or AG
Microchip fabrication facilities	Health	RPBA or AG
Paper and paper products plants	Health	RPBA or AG
Petroleum processing or storage facilities	Health	RPBA or AG

Photo and film processing labs	Health	RPBA or AG
Plants using radioactive material	Health	RPBA or AG
Plating or chemical plants	Health	RPBA or AG
Pleasure-boat marinas	Health	RPBA or AG
Private/Individual/Unmonitored wells	Health	RPBA or AG
Rainwater harvesting system	Health	RPBA or AG
Reclaimed water systems	Health	RPBA or AG
Restricted, classified or other closed facilities	Health	RPBA or AG
Rubber plants	Health	RPBA or AG
Sewage lift stations	Health	RPBA or AG
Sewage treatment plants	Health	RPBA or AG
Slaughter houses	Health	RPBA or AG
Steam plants	Health	RPBA or AG
Tall buildings or elevation differences where the highest outlet is 80 feet or more above the meter	Nonhealth	DCVA

Internal Protection - Description of Cross-Connection	Assessment of Hazard	Required Assembly
Aspirators	Nonhealth†	AVB
Aspirator (medical)	Health	AVB or PVB
Autoclaves	Health	RPBA
Autopsy and mortuary equipment	Health	AVB or PVB
Bedpan washers	Health	AVB or PVB
Connection to industrial fluid systems	Health	RPBA
Connection to plating tanks	Health	RPBA
Connection to salt-water cooling systems	Health	RPBA
Connection to sewer pipe	Health	AG

Cooling towers with chemical additives	Health	AG
Cuspidors	Health	AVB or PVB
Degreasing equipment	Nonhealth†	DCVA
Domestic space-heating boiler	Nonhealth†	RPBA
Dye vats or machines	Health	RPBA
Fire-fighting system (toxic liquid foam concentrates)	Health	RPBA
Flexible shower heads	Nonhealth†	AVB or PVB
Heating equipment		
Commercial	Nonhealth†	RPBA
Domestic	Nonhealth†	DCVA
Hose bibs	Nonhealth†	AVB
Irrigation systems		
with chemical additives	Health	RPBA
without chemical additives	Nonhealth†	DCVA, AVB, or PVB
Kitchen equipment - Commercial	Nonhealth†	AVB
Lab bench equipment	Health or Nonhealth†	AVB or PVB
Ornamental fountains	Health	AVB or PVB
Swimming pools		
Private	Nonhealth†	PVB or AG
Public	Nonhealth†	RPBA or AG
Sewage pump	Health	AG
Sewage ejectors	Health	AG
Shampoo basins	Nonhealth†	AVB
Specimen tanks	Health	AVB or PVB
Steam generators	Nonhealth†	RPBA
Steam tables	Nonhealth†	AVB
Sterilizers	Health	RPBA
Tank vats or other vessels containing toxic substances	Health	RPBA
Trap primers	Health	AG

Vending machines	Nonhealth†	RPBA or PVB
Watering troughs	Health	AG or PVB

NOTE: AG = air gap; AVB = atmospheric vacuum breaker; DCVA = double check valve backflow prevention assembly; PVB = pressure vacuum breaker; RPBA = reduced-pressure principle backflow prevention assembly.

*AVBs and PVBs may be used to isolate health hazards under certain conditions, that is, back siphonage situations. Additional area of premises isolation may be required.

†Where a greater hazard exists (due to toxicity or other potential health impact) additional area protection with RPBAs is required.

(g) Appendix G. Emergency Preparedness Plan Template.

Figure: 30 TAC §290.47(g) (No change to the figure as it currently exists in TAC.)

Appendix G: Emergency Preparedness Plan Template

This appendix contains information to assist an affected utility in preparing an emergency preparedness plan. A comprehensive guide and shell form, TCEQ Form No. 20536, for preparing a plan is available from the executive director upon request. A cover letter containing the name of the affected utility; the affected utility representative's name, title, and contact telephone number; and, if applicable, the public water system's identification number (PWS ID) and district number must be included with the plan submittal.

Information provided by an affected utility relating to its emergency preparedness plan is confidential and is not subject to disclosure under Texas Government Code, Chapter 552.

Rules. All of 30 TAC Chapter 291, Subchapter L applies to affected utilities that are not public water systems. The following commission rules apply to affected utilities that are public water systems:

Definitions: §290.38

General Provisions: §290.39(c)(4)(A) - (E) and (o)(1) - (5)

Water Distribution: §290.44(d)

Minimum Water System Capacity Requirements: §290.45(a)(7), (b)(3), (c)(3), (d)(4), (e)(4), (g)(5)(A)(iv), (g)(5)(B), and (h).

Minimum Acceptable Operating Practices for Public Drinking Water Systems: §290.46(f)(5) and (r).

Plan Options. A submitted emergency preparedness plan must include one of the following:

(1) Auxiliary generators equipped with automatic starting generators and switch over equipment. This equipment must have the ability to detect the failure of normal power from the electric grid; automatically start the generator; isolate necessary water equipment from the normal power grid; and switch the running generator's power to power the necessary water equipment to maintain the required minimum pressure.

(2) Two or more affected utilities may propose the sharing of auxiliary generator power. Necessary electrical and/or water connections equipped with automatic switch over and opening valves must be presented in the plan to demonstrate how one or more affected utilities will be able to maintain the required minimum pressure. Describe which equipment will share the auxiliary generator power and which equipment, if any, would receive power from only a single affected utility's auxiliary power equipment.

(3) Copies of negotiated leasing and contract agreements for emergency power equipment and any necessary fuel. This includes mutual aid agreements with other retail public utilities, exempt utilities, or providers or conveyors of potable or raw water service if the agreements provide for coordination with the division of emergency management in the governor's office. Consideration must be given to the location of where the other water supplier(s) are located as they may also be affected by the same natural disaster. In addition, when entering into a contract for leasing of emergency power equipment and necessary fuel, the contractual commitments of the supplier to other water suppliers and businesses within an area subject to the same natural disaster event must be taken into consideration.

(4) Use of portable generators capable of serving multiple facilities. The portable generator(s) and the necessary water equipment must be pre-equipped with quick-connect, mating electrical connectors to facilitate the rapid implementation of the emergency preparedness plan. The plan must address whether there is an adequate number of portable generators to operate all of the necessary water equipment in order to maintain the required minimum pressure in multiple pressure plans or at multiple systems, if affected by the same natural disaster event.

(5) In lieu of generators, alternative on-site electrical generation, or distributed electrical generation facilities, may be used. This may include the use of wind, solar

or other power as a means of providing sufficient emergency power to operate the necessary water equipment to maintain the required minimum pressure.

(6) Hardening of the electric transmission and distribution system serving the affected utility. One alternative is to relocate electric transmission lines for the system from overhead to underground and protect them from flooding. Another alternative is to replace overhead transmission lines, poles, and related appurtenances with ones that can withstand historical hurricane-force wind velocities, and trim or remove any trees next to and above the overhead transmission lines. Either alternative must include documentation on the ability of applicable power plant(s) and station(s) to withstand hurricane-force winds.

(7) Engines equipped with direct or right angle drives can be used as auxiliary power sources. Each pump or other equipment must be equipped with appropriate mechanical fittings to facilitate the use of engines. The plan must address the operation of chemical feed pumps using a generator(s).

(8) Any other alternative determined by the executive director to be acceptable.

Plan Contents. An emergency preparedness plan must provide for any applicable production, treatment, transfer and service pumps at an adequate flow rate and at a minimum pressure of 35 pounds per square inch in the far reaches of an affected distribution system, including multiple pressure planes. If applicable, provide the following information:

□ Contact information, including names, emergency telephone and pager numbers, and e-mail addresses.

□ List all ground, surface, and purchased water sources, with locations and individual capacities.

□ List all interconnections with other water providers; whether normally open or closed; size; whether wholesale, purchase, or both; available capacity; and any other pertinent information. Include the names of each interconnection and their contact information, including names, titles, telephone and pager numbers, and e-mail addresses.

□ List the capacity and power requirements of all treatment equipment.

□ For each chemical, list the type of storage, volume, and volume required per day during emergency operations.

□ Provide a copy of all water distribution and transmission piping maps.

□ Provide the maximum and average daily demands. If the emergency preparedness plan is for a proposed affected utility, the minimum specified capacities in §290.45 of this subchapter shall be used for the maximum daily demand.

□ List all primary electrical power sources.

□ List all equipment necessary to provide water to customers at the required minimum pressure and adequate flow rate, and the power requirements for each piece of equipment.

□ List the size, location and fuel requirement in gallons per hour at the load necessary to maintain emergency operations for all on-site manual and automatic auxiliary power equipment, and provide information as to how the affected utility determined the necessary fuel quantity.

□ Provide documentation as to how the affected utility will ensure that it maintains an adequate supply of fuel during emergency operations.

□ List the size, location, fuel requirement in gallons per hour at the load necessary to maintain emergency operations, and the name of the system sharing the equipment for all shared auxiliary power equipment. Include the other system's contact persons with their emergency telephone and pager numbers and e-mail addresses.

□ Provide a copy of any leasing and contracting agreements, including mutual aid agreements with other retail public utilities, exempt utilities, or providers or conveyors of potable or raw water service, if the agreements provide for coordination with the division of emergency management in the governor's office. If leasing, include the vendor's name, location, and contact information.

□ List all portable generators' power, phase, type of quick-connect, fuel type, and fuel demand in gallons per hour.

□ Provide specifications, a description, and detailed capacity information for all on-site electrical generation or distributive generation equipment. Include all fuel demands for this equipment.

□ List all direct or right angle drive emergency power equipment with the name, type of engine, fuel type, and fuel demand in gallons per hour.

□ Provide details for any other proposed alternative.

□ For each fuel tank, provide the location, volume, name of fuel suppliers, contact names, titles, telephone and pager numbers, and e-mail addresses.

□ List all local and state emergency responders and their emergency contact telephone and pager numbers. Include medical facilities.

□ List all priority water users, such as hospitals and nursing homes, and their emergency contact names, titles, telephone and pager numbers, and e-mail addresses.

□ List any bulk water haulers that could be used, including contact names, telephone and pager numbers, and e-mail addresses.

□ Provide the system's designated media spokesperson with a list of local media contact names, titles, type of media, telephone and pager numbers, and e-mail addresses.

□ Provide the water restrictions that the system will implement during an emergency response.

□ Provide a proposed time frame for full implementation of the emergency preparedness plan.

(h) Appendix H. Sample Language for Notification Upon Changing from Free Chlorine to Chloramines.

Figure: 30 TAC §290.47(h) (No change to the figure as it currently exists in TAC.)

Appendix H: Sample Language for Notification Upon Changing from Free Chlorine to Chloramines

A public water system (PWS) must notify its customers, in writing, at least 14 days before starting to use chloramines. This notification must contain the Sample Language for Notification Upon Changing from Free Chlorine to Chloramines included below. The notification should be provided to the news media, renal disease facilities, dialysis clinics, hospitals, physicians, local health departments, pet stores, zoos, and any other facilities that may be impacted by the change.

Sample Language for Notification Upon Changing from Free Chlorine to Chloramines

"On <**Date**>, the <**Water System Name**> will be changing the disinfectant that we use from chlorine to chloramines. This change is intended to benefit our customers by reducing the levels of disinfection byproducts in the system, while still providing

protection from waterborne disease.

However, the change to chloramines can cause problems to persons dependent on dialysis machines. A condition known as hemolytic anemia can occur if the disinfectant is not completely removed from the water that is used for the dialysate. Consequently, the pretreatment scheme used for the dialysis units must include some means, such as a charcoal filter, for removing the chloramine prior to this date. Medical facilities should also determine if additional precautions are required for other medical equipment. In addition, chloraminated water may be toxic to fish. If you have a fish tank, please make sure that the chemicals or filters that you are using are designed for use in water that has been treated with chloramines. You may also need to change the type of filter that you use for fish tanks."

Optional: "When the chloraminated water first flushes out the chlorinated water there may be a slight taste and odor, and possibly discoloration for a short period of time. This will not compromise the safety of the water."

Important notes:
1. The PWS may not begin using chloramines prior to the date shown in the notice.

2. The Texas Commission on Environmental Quality does not require the PWS to include the name or contact telephone number of a PWS employee that the customers can contact if they have questions; however, several PWSs have included this information as a courtesy to its customers.

SUBCHAPTER F: DRINKING WATER STANDARDS GOVERNING DRINKING WATER QUALITY AND REPORTING REQUIREMENTS FOR PUBLIC WATER SYSTEMS

§§290.102 - 290.104, 290.106 - 290.119, 290.121, 290.122

Statutory Authority

These amendments are proposed under the Texas Water Code (TWC), §5.102, which establishes the commission's general authority necessary to carry out its jurisdiction; TWC, §5.103, which establishes the commission's general authority to adopt rules; TWC, §5.105, which establishes the commission's authority to set policy by rule; and Texas Health and Safety Code (THSC), §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 United States Code §§300f - 300j-26; and THSC, §341.0315, which requires public water systems to comply with commission rules adopted to ensure the supply of safe drinking water.

§290.102. General Applicability.

(a) General applicability. This subchapter shall apply to all public water systems as described in each section, unless the system:

(1) consists only of distribution and storage facilities (and does not have any production and treatment facilities);

(2) obtains all of its water from, but is not owned or operated by, a public water system to which such standards apply;

(3) does not sell water to any person;

(4) is not a carrier which conveys passengers in interstate commerce; and

(5) is subject to plumbing restrictions and inspections by the public water system which provides the water.

(b) Variances and exemptions. Variances and exemptions may be granted at the discretion of the executive director according to the Safe Drinking Water Act (SDWA), 42 United States Code (USC), §300g-4 and §300g-5, and according to National Primary Drinking Water Regulations Implementation, Subpart K, 40 Code of Federal Regulations (CFR) §§142.301 - 142.313. The executive director may not approve variances or exemptions from:

(1) the maximum contaminant level (MCL) for *Escherichia coli* (*E. coli*), [total coliforms,] nitrate, nitrite, or total nitrate and nitrite;

(2) the maximum residual disinfection level (MRDL) for chlorine dioxide; or

(3) the treatment technique requirements for filtration and disinfection.

(c) Extensions. An extension to the compliance deadline for an MCL or treatment technique that becomes effective on or after January 1, 2002, may be granted at the discretion of the executive director in accordance with the SDWA, 42 USC, §300g-1(b)(10).

(1) The executive director may extend the effective date of an MCL or treatment technique for up to two years if all of the following conditions apply:

(A) there are no acute violations associated with the new MCL or treatment technique for which the extension is being granted;

(B) the executive director determines that granting the extension will not result in an unreasonable risk to public health;

(C) the extension is granted only to public water systems that were in operation on the date that the MCL or treatment technique was promulgated by the United States Environmental Protection Agency (EPA);

(D) the executive director determines that capital improvements are needed to comply with the new MCL or treatment technique;

(E) the executive director approves a schedule identifying the capital improvements necessary to bring the system into compliance with the new MCL or treatment technique; and

(F) the EPA has not already incorporated a two-year extension into the effective date for the new MCL or treatment technique requirement.

(2) An application for an extension must be submitted to the executive director in writing by the owner or responsible party of the water system. The request must include a statement identifying the new MCL or treatment technique which is not being met and a general long range plan for meeting the new requirement.

(3) The executive director may issue an extension covering a group or class of systems with a common MCL or treatment technique which is not met without individual applications.

(d) Motion to overturn. Any person may file a motion to overturn the executive director's decision to grant or deny a variance, exemption, or extension under this section according to the procedures set out in §50.139 of this title (relating to Motion to Overturn Executive Director's Decision).

(e) Monitoring schedule. All monitoring required by this chapter shall be conducted in a manner and on a schedule approved by the executive director in concurrence with the requirements of the administrator of the EPA.

(f) Modified monitoring. When a public water system supplies water to one or more other public water systems, the executive director may modify the monitoring

requirements imposed by this chapter to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the executive director in concurrence with the requirements of the administrator of the EPA.

(g) The owner or operator of a public water system shall provide the executive director with a copy of the results of any test, measurement, or analysis required by this subchapter. The copies shall be submitted within the first ten days following the month in which the result is received by the public water system, or the first ten days following the end of the required monitoring period as provided by this subchapter, whichever occurs first.

§290.103. Definitions.

The following definitions shall apply in the interpretation and enforcement of this subchapter. If a word or term used in this subchapter is not contained in the following list, its definition shall be as shown in §290.38 of this title (relating to Definitions) or in 40 Code of Federal Regulations (CFR) §141.2. Other technical terms used shall have the meanings or definitions listed in the latest edition of "Glossary, Water and Wastewater Control Engineering," prepared by a joint editorial board representing the American Public Health Association, American Society of Civil Engineers, American Water Works Association, and the Water Pollution Control Federation.

(1) Assessment source monitoring--Raw groundwater source monitoring required by the executive director based on groundwater source susceptibility to fecal contaminants.

(2) Combined distribution system (CDS)--The interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

(A) The executive director may determine that the CDS does not include certain systems based on factors such as providing or receiving a relatively small amount of water or only on an emergency basis.

(B) A public water system may be determined to be in a different CDS for the purposes of compliance with regulations based on the Stage 2 Disinfection Byproducts Rule (DBP2) and the Long Term Stage 2 Enhanced Surface Water Treatment Rule (LT2).

(i) For the purposes of raw water monitoring under LT2, the CDS shall be based on the retail and wholesale population served by each surface water treatment plant or plant treating groundwater under the direct influence of surface water.

(ii) For the purposes of DBP2, the CDS shall be determined based on the retail population served within each individual system's distribution system.

(3) Compliance cycle--The nine-year (calendar year) cycle during which public water systems must monitor. Each compliance cycle consists of three, three-year compliance periods. [The first compliance cycle begins January 1, 1993, and ends December 31, 2001. The second begins January 1, 2002, and ends December 31, 2010. The third begins January 1, 2011, and ends December 31, 2019. The cycle continues thereafter in a similar pattern.]

(4) Compliance period--A three-year (calendar year) period within a compliance cycle. Each compliance cycle has three, three-year compliance periods. Within the first compliance cycle, the first compliance period is called the initial compliance period [and runs from January 1, 1993, to December 31, 1995. The second period from January 1, 1996, to December 31, 1998. The third period from January 1, 1999, to December 31, 2001. Compliance periods in subsequent compliance cycles follow the same pattern].

(5) Comprehensive performance evaluation (CPE)--A thorough review and analysis of a treatment plant's performance-based capabilities and the associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and to emphasize approaches that can be implemented without significant capital improvements. The comprehensive performance evaluation consists of the following components: assessment of plant performance; evaluation of major unit processes;

identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report.

(6) Consecutive system--A public water system that receives some or all of its raw water or finished water from one or more other public water systems.

(7) Disinfection profile--A summary of daily *Cryptosporidium*, *Giardia lamblia*, and viral inactivation obtained through disinfection at the treatment plant.

(8) Disinfection by-products (DBP)--Chemical compounds formed by the reaction of a disinfectant with the natural organic matter present in water.

(9) Domestic or other non-distribution system plumbing problem--A coliform contamination problem in a public water system with more than one service connection that is limited to the specific service connection from which the coliform-positive sample was taken.

(10) [(9)] DPD--Abbreviation for N,N-diethyl-p-phenylenediamine, a reagent used in the determination of several residuals. DPD methods are available for both volumetric (titration) and colorimetric determinations, and are commonly used in the field as part of a colorimetric test kit.

(11) [(10)] Dual sample set--A set of two samples collected at the same time and same location, with one sample analyzed for total trihalomethanes (TTHM) and the other sample analyzed for haloacetic acids-group of five (HAA5). Dual sample sets are collected for the purposes of conducting an initial distribution system evaluation and determining compliance with the TTHM and HAA5 maximum contaminant levels.

(12) [(11)] Enhanced coagulation--The removal of disinfection by-product precursors to a specified level by conventional coagulation and sedimentation.

(13) [(12)] Enhanced softening--The removal of disinfection by-product precursors to a specified level by softening.

(14) [(13)] Entry point--Any point where a source of treated water first enters the distribution system. Entry points to the distribution system may include points where chlorinated well water, treated surface water, rechlorinated water from storage, or water purchased from another supplier enters the distribution system.

(15) [(14)] Entry point sampling site--A sampling site representing the quality of the water entering the distribution system at each designated entry point.

(16) [(15)] Fecal indicators--Microbiological organisms used to indicate the presence of fecal contamination. Examples include; fecal coliform, *Escherichia coli* (*E. coli*) [*E. coli*], enterococci, and coliphage.

(17) [(16)] Filter assessment--An in-depth evaluation of an individual filter, including the analysis of historical filtered water turbidity from the filter, development of a filter profile, evaluation of media condition, identification and prioritization of factors limiting filter performance, appraisal of the applicability of corrections, and preparation of a filter self-assessment report.

(18) [(17)] Filter profile--A graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run. The filter profile must include all the data collected from the time that the filter placed into service until the time that the backwash cycle is complete and the filter is restarted. The filter profile must also include data collected as another filter is being backwashed.

(19) [(18)] Finished water--Water that is introduced into the distribution system of a public water system and intended for distribution and consumption without further treatment, except as necessary to maintain water quality within the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).

(20) [(19)] Groundwater corrective action--Action required when a raw groundwater source sample is found to be positive for *Escherichia coli* (*E. coli*) [E. coli] or other fecal indicators as described under §290.116(b) of this title (relating to Groundwater Corrective Actions and Treatment Techniques).

(21) [(20)] Groundwater corrective action plan--A plan approved by the executive director documenting the steps to be taken to address fecal contamination of a groundwater source as described under §290.116(b) of this title (relating to Groundwater Corrective Actions and Treatment Techniques). The groundwater corrective action plan must be approved within 30 days of being notified of the fecal contamination.

(22) [(21)] Groundwater system--For the purposes of compliance with §290.109 of this title (relating to Microbial Contaminants) and with §290.116 of this title (relating to Groundwater Corrective Actions and Treatment Techniques), a public water system that provides, uses, or distributes any groundwater except if the groundwater is combined with surface water (or with groundwater under the direct influence of surface water) prior to treatment.

(23) [(22)] Haloacetic acids (five) (HAA5)--The sum of the monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid concentrations in milligrams per liter, rounded to two significant figures after adding the sum.

(24) [(23)] Halogen--One of the chemical elements chlorine, bromine, or iodine.

(25) [(24)] Hydrogeologic sensitivity assessment--A determination of whether groundwater systems obtain water from hydrogeologically sensitive sources.

(26) Level 1 assessment--An evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the public water system triggered the assessment. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including, but not limited to water storage); source and treatment considerations that bear on distributed water quality, where appropriate; existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The public water system must conduct the assessment consistent with any executive director directives that tailor specific assessment elements with respect to the size and type of the public water system and the size, type, and characteristics of the distribution system.

(27) Level 2 assessment--An evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the public water system triggered the assessment. A Level 2 assessment provides a more detailed examination of the public water system (including, but not limited to the public water system's monitoring and operational practices) than does a Level 1 assessment through the use of a more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. Minimum elements include review and identification of atypical events

that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including, but not limited to water storage); source and treatment considerations that bear on distributed water quality, where appropriate; existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The public water system must conduct the assessment consistent with any executive director directives that tailor specific assessment elements with respect to the size and type of the public water system and the size, type, and characteristics of the distribution system. The public water system must comply with any expedited actions or additional actions required by the executive director in the case of an *Escherichia coli* (*E.coli*) maximum contaminant level violation.

(28) [(25)] Locational running annual average (LRAA)--The average of analytical results for samples taken at a specific monitoring location during the previous four calendar quarters.

(29) [(26)] Maximum contaminant level (MCL)--The maximum concentration of a regulated contaminant that is allowed in drinking water before the public water system is cited for a violation. MCLs [Maximum contaminant levels] for regulated contaminants are defined in the applicable sections of this subchapter.

(30) [(27)] Maximum residual disinfectant level (MRDL)--The disinfectant concentration that may not be exceeded in the distribution system. There is convincing

evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants.

(31) [(28)] Minimum acceptable disinfectant residual--The lowest disinfectant concentration allowed in the distribution system for microbial control.

(32) [(29)] Operational evaluation level (OEL)--Calculated level of total trihalomethanes (TTHM) or haloacetic acid group of five (HAA5), an exceedance of which requires a system to perform an evaluation of factors in the distribution system contributing to disinfection by-product formation and submit an operation evaluation report as described in §290.115(e)(2) of this title (relating to Stage 2 Disinfection Byproducts (TTHM and HAA5)). The OEL at any monitoring location is the sum of the two previous quarters' results plus twice the current quarter's result, divided by 4 to determine an average.

(33) [(30)] Raw water--Water prior to any treatment including disinfection that is intended to be used, after treatment, as drinking water.

(A) Raw groundwater is water from a groundwater source.

(B) Raw surface water is any water from a surface water source or from a groundwater under the direct influence of surface water source.

(34) [(31)] Raw groundwater source monitoring--Fecal indicator sampling at untreated groundwater sources including triggered source water and assessment source monitoring.

(35) 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.

(36) Seasonal public water system--A noncommunity public water system that is not operated as a public water system on a year-round basis and starts up and shuts down at the beginning and end of each operating season.

(37) [(32)] Significant deficiency--Significant deficiencies cause, or have the potential to cause, the introduction of contamination into water delivered to customers. This could include defects in design, operation, or maintenance of the source, treatment, storage, or distribution systems.

(38) [(33)] Specific ultraviolet absorption at 254 nanometers (nm) (SUVA)--An indirect indicator of whether the organic carbon in water is humic or non-humic. It is calculated by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV254) (in inverse meters) by its concentration of dissolved organic carbon (DOC) (in milligrams per liter).

(39) [(34)] Total organic carbon (TOC)--The concentration of total organic carbon, in milligrams per liter, measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures. TOC is a surrogate measure for precursors to formation of disinfection by-products.

(40) [(35)] Total trihalomethanes (TTHM)--The sum of the chloroform, dibromochloromethane, bromodichloromethane, and bromoform concentrations in milligrams per liter, rounded to two significant figures after summing.

(41) [(36)] Triggered source water monitoring--Raw groundwater source monitoring required for systems not providing at least 4-log treatment of viruses when a routine distribution coliform sample is positive.

(42) [(37)] Trihalomethane (THM)--One of the family of organic compounds named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

(43) [(38)] Wholesale system--A public water system that delivers water to another public water system.

(44) [(39)] 4-log treatment--At least 99.99% (4-log) treatment of viruses using inactivation, removal, or an [a] executive director-approved combination of 4-log virus

inactivation and removal. The 4-log treatment must be able to be properly validated and achieved before the first connection of the specified water source.

§290.104. Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels.

(a) Summary table purpose. The maximum contaminant levels (MCLs), maximum residual disinfectant levels (MRDLs), treatment techniques, and action levels are presented in this section as a reference source. Only the regulatory concentrations are shown in these tables. Compliance requirements are given in the specific section for each chemical.

(b) MCLs for inorganic compounds. The MCLs for inorganic contaminants listed in this subsection apply to public water systems as provided in §290.106 of this title (relating to Inorganic Contaminants).

Figure: 30 TAC §290.104(b) (No change to the figure as it currently exists on TAC.)

Contaminant	**MCL (mg/L)**
Antimony	0.006
Arsenic	0.010
Asbestos	7 million fibers/liter (longer than 10 µm)
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide	0.2 (as free Cyanide)

Fluoride	4.0
Mercury	0.002
Nitrate	10 (as Nitrogen)
Nitrite	1 (as Nitrogen)
Nitrate &	10 (as Nitrogen)
Nitrite (Total)	0.05
Selenium	0.002
Thallium	

(c) MCLs for organic compounds. The following MCLs for synthetic organic contaminants and volatile organic contaminants apply to public water systems as provided in §290.107 of this title (relating to Organic Contaminants).

(1) The following are the MCLs for synthetic organic contaminants.

Figure: 30 TAC §290.104(c)(1) (No change to the figure as it currently exists in TAC.)

Contaminant	**MCL (mg/L)**
Alachlor	0.002
Atrazine	0.003
Benzopyrene	0.0002
Carbofuran	0.04
Chlordane	0.002
Dalapon	0.2
Dibromochloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.006
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene dibromide	0.00005
Glyphosate	0.7

Heptachlor	0.0004
Heptachlor epoxide	0.0002
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.04
Oxamyl (Vydate)	0.2
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated biphenyls (PCB)	0.0005
Simazine	0.004
Toxaphene	0.003
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
2,4,5-TP	0.05
2,4-D	0.07

(2) The following are the MCLs for volatile organic contaminants.

Figure: 30 TAC §290.104(c)(2) (No change to the figure as it currently exists in TAC.)

Contaminant	MCL (mg/L)
1,1-Dichloroethylene	0.007
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
1,2-Dichloroethane	0.005
1,2-Dichloropropane	0.005
1,2,4-Trichlorobenzene	0.07
Benzene	0.005
Carbon tetrachloride	0.005
cis-1,2-Dichloroethylene	0.07

Dichloromethane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
o-Dichlorobenzene	0.6
para-Dichlorobenzene	0.075
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
trans-1,2-Dichloroethylene	0.1
Trichloroethylene	0.005
Vinyl chloride	0.002
Xylenes (total)	10

(d) MCLs for radionuclide contaminants. MCLs for radionuclide contaminants apply to public water systems as provided in §290.108 of this title (relating to Radionuclides Other than Radon).

(e) Microbial contaminants. The MCL for microbial or bacteriological contaminants applies to public water systems as provided in §290.109 of this title (relating to Microbial Contaminants). The MCL for microbiological contaminants is based on the presence or absence of *Escherichia coli* (*E. coli*). [The MCL for microbiological contaminants is based on the presence or absence of total coliform bacteria in a sample.]

(f) Minimum residual disinfectant concentrations and MRDLs. Minimum residual disinfectant concentrations and MRDLs apply to public water systems as provided in §290.110 of this title (relating to Disinfectant Residuals).

(1) The minimum residual disinfectant concentration in the water entering the distribution system is 0.2 milligrams per liter (mg/L) free chlorine or 0.5 mg/L chloramine.

(2) The minimum residual disinfectant concentration in the water within the distribution system is 0.2 mg/L free chlorine or 0.5 mg/L chloramine.

(3) The MRDL of chlorine dioxide in the water entering the distribution system is 0.8 mg/L.

(4) The MRDL of free chlorine or chloramine in the water within the distribution system is 4.0 mg/L based on a running annual average.

(g) Surface water treatment. Systems treating surface water or groundwater under the direct influence of surface water must meet the turbidity treatment technique requirements as provided in §290.111 of this title (relating to Surface Water Treatment).

(1) The turbidity level of the combined filter effluent must never exceed 1.0 nephelometric turbidity unit (NTU) and the turbidity level of the combined filter effluent must be 0.3 NTU or less in at least 95% of the samples tested each month.

(2) Systems are subject to the raw water monitoring, pathogen removal and inactivation and individual filter turbidity provisions of §290.111 of this title.

(h) Disinfection by-product precursors. The treatment technique requirements for disinfection by-product precursors apply to water systems as provided in §290.112 of this title (relating to Total Organic Carbon (TOC)).

(i) Disinfection by-products (total trihalomethanes (TTHM) and haloacetic acids (HAA5)). The MCLs for TTHM and HAA5 apply to water systems as provided in §290.113 of this title (relating to Stage 1 Disinfection By-products (TTHM and HAA5)) and in §290.115 of this title (relating to Stage 2 Disinfection By-products (TTHM and HAA5)). The MCLs for TTHM and HAA5 are:

(1) 0.080 mg/L for TTHM; and

(2) 0.060 mg/L for HAA5.

(j) Disinfection by-products other than TTHM and HAA5. The MCLs for chlorite and bromate apply to water systems as provided in §290.114 of this title (relating to Other

Disinfection By-products (Chlorite and Bromate)). The MCLs for chlorite and bromate are as follows:

(1) 1.0 mg/L for chlorite; and

(2) 0.010 mg/L for bromate.

(k) Lead and copper action levels. The action levels for lead and copper apply to water systems as provided in §290.117 of this title (relating to Regulation of Lead and Copper). Action levels for lead and copper are as follows:

(1) 0.015 mg/L for lead; and

(2) 1.3 mg/L for copper.

(l) Recycle streams. The treatment technique requirements for recycle streams are specified in §290.42(c)(6) and (d)(3) of this title (relating to Water Treatment).

§290.106. Inorganic Contaminants.

(a) Applicability. All public water systems are subject to the requirements of this section.

(1) Community and nontransient, noncommunity systems shall comply with the requirements of this section regarding monitoring, reporting, and maximum contaminant levels (MCLs) for all inorganic contaminants (IOCs) listed in this section.

(2) Transient, noncommunity systems shall comply with the requirements of this section regarding monitoring, reporting, and MCL for nitrate and nitrite.

(3) For purposes of this section, systems using groundwater under the direct influence of surface water shall meet the inorganic sampling requirements given for surface water systems.

(b) MCLs [Maximum contaminant levels] for IOCs. The MCLs for IOCs listed in the following table apply to community and nontransient, noncommunity water systems. The MCLs for nitrate, nitrite, and total nitrate and nitrite also apply to transient, noncommunity water systems.

Figure: 30 TAC §290.106(b) (No change to the figure as it currently exists in TAC.)

Contaminant	**MCL (mg/L)**
Antimony	0.006
Arsenic	0.010
Asbestos	7 million fibers/liter (longer than 10µm)
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide	0.2 (as free Cyanide)
Fluoride	4.0

Mercury	0.002
Nitrate	10 (as Nitrogen)
Nitrite	1 (as Nitrogen)
Nitrate & Nitrite (Total)	10 (as Nitrogen)
Selenium	0.05
Thallium	0.002

(c) Monitoring requirements for IOCs. Public water systems shall monitor for IOCs at the locations specified by the executive director. All monitoring conducted under the requirements of this section must be conducted at sites designated in the public water system's monitoring plan. Each public water system shall monitor at the time designated during each compliance period.

(1) Routine monitoring locations for IOCs except asbestos. Antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nitrate, nitrite, selenium, and thallium shall be monitored at each entry point to the distribution system.

(A) If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point that is representative of all sources and during periods of normal operating conditions.

(B) Systems shall take all subsequent samples at the same entry point to the distribution system unless the executive director determines that conditions make another entry point more representative of the source or treatment plant being monitored.

(C) The executive director may approve the use of composite samples.

(i) Compositing must be done in the laboratory or in the field by persons designated by the executive director.

(ii) Compositing shall be allowed only at groundwater entry points to the distribution system.

(iii) Compositing shall be allowed only within a single system. Samples from different systems shall not be included in a composite sample.

(iv) No more than five individual samples shall be included in a composite sample.

(v) The maximum number of individual samples allowed in a composite sample shall not exceed the number obtained by dividing the MCL for the contaminant by the detection limit of the analytical method and rounding the quotient to the next lowest integer. Detection limits for each analytical method are as listed in 40 Code of Federal Regulations (CFR) §141.23(a)(4)(i).

(vi) If the concentration in the composite sample is greater than or equal to the proportional contribution of the MCL (e.g., 20% of MCL when five points are composited) for any inorganic chemical, then a follow-up sample must be collected from each sampling point included in the composite sample.

(I) Follow-up samples must be collected within 14 days of receipt of the composite sample results.

(II) If duplicates of the original sample taken from each entry point to the distribution system used in the composite are available, the system may use these instead of resampling. The duplicates must be analyzed within 14 days of the composite.

(III) The follow-up or duplicate samples must be analyzed for the contaminant(s) which were excessive in the composite sample.

(D) Initial monitoring for a new water source must be conducted at a site representative of the water quality of the new source of water. For systems with one well and one entry point, initial monitoring may be conducted at the entry point to the distribution system.

(2) Monitoring locations for asbestos. Asbestos shall be monitored at locations where asbestos contamination is most likely to occur.

(A) A system vulnerable to asbestos contamination due solely to source water shall sample at the entry point to the distribution system.

(B) A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall sample at a tap served by asbestos-cement pipe, under conditions where asbestos contamination is most likely to occur.

(C) A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall sample at a tap served by asbestos-cement pipe, under conditions where asbestos contamination is most likely to occur.

(D) The executive director may require additional sampling locations based on the size, length, age, and location of asbestos-cement pipe in the distribution system. The system must provide information regarding the size, length, age, and location of asbestos-cement pipe in the distribution system to the executive director upon request.

(3) Initial monitoring frequency for IOCs except asbestos. Prior to using water as a drinking water source, public water systems shall monitor at the frequency determined by the executive director to ensure that the water distributed to customers will comply with the MCLs for antimony, arsenic, barium, beryllium, cadmium, chromium,

cyanide, fluoride, nitrate, nitrite [nitrate], nitrate and nitrite (total), mercury, selenium, and thallium.

(4) Monitoring frequency for IOCs except asbestos, nitrate, and nitrite. Community and nontransient, noncommunity public water systems shall monitor for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium at the following frequency.

(A) Routine monitoring frequency. A public water system shall routinely monitor for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium.

(i) Each groundwater entry point shall be sampled once every three years.

(ii) Each surface water entry point shall be sampled annually.

(iii) Each of the sampling frequencies listed in this paragraph constitutes one round of sampling for groundwater and surface water entry points, respectively.

(B) Reduced monitoring. The executive director may reduce the monitoring frequency for a system that has completed a minimum of three rounds of

sampling by granting a waiver to the routine monitoring frequency for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium.

(i) Systems that use a new water source are not eligible for a waiver until three rounds of sampling from the new source have been completed.

(ii) To be considered for a waiver, systems shall demonstrate that all previous analytical results at that sample site were less than the MCL.

(iii) In determining the appropriate reduced monitoring frequency, the executive director shall consider:

(I) the reported contaminant concentrations from all previous samples;

(II) the degree of variation in reported concentrations; and

(III) other factors that may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in the flow or characteristics of a reservoir or stream used as the water source.

(iv) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(v) The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(vi) A system must take a minimum of one sample during each compliance cycle while the waiver is effective.

(C) Increased monitoring. The executive director may increase the monitoring frequency for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium.

(i) If the results from a sample site exceed any of the MCLs in subsection (b) of this section, the system shall immediately begin quarterly sampling at that sample site starting in the next quarter after the exceedance occurs.

(ii) After the initiation of quarterly monitoring, the executive director may return a system to the routine monitoring frequency if monitoring shows that the sampling site is reliably and consistently below the MCL.

(I) The executive director shall not decrease the quarterly sampling requirement until a groundwater system has taken a minimum of two quarterly samples.

(II) The executive director shall not decrease the quarterly sampling requirement until a surface water system has taken a minimum of four quarterly samples.

(5) Asbestos monitoring frequency. Community and nontransient, noncommunity water systems shall monitor for asbestos at the following frequency.

(A) A public water system shall routinely monitor for asbestos once during the first three years of each compliance cycle.

(B) The executive director may waive the routine monitoring frequency requirements for asbestos.

(i) When determining if a waiver should be granted, the executive director shall consider:

(I) the potential for asbestos contamination of the water source;

(II) the use of asbestos-cement pipe for finished water distribution; and

(III) the corrosivity of the water.

(ii) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(iii) The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(C) The executive director may increase the monitoring frequency for asbestos.

(i) A system that exceeds the MCL for asbestos shall sample quarterly beginning in the next quarter after the violation occurs.

(ii) After the initiation of quarterly sampling, the executive director may return a system to the routine monitoring frequency if monitoring shows that the system is reliably and consistently below the MCL.

(I) The executive director shall not decrease the quarterly sampling requirement until a groundwater system has taken a minimum of two quarterly samples.

(II) The executive director shall not decrease the quarterly sampling requirement until a surface (or combined surface water and groundwater) water system has taken a minimum of four quarterly samples.

(6) Nitrate monitoring frequency. All public water systems shall monitor for nitrate at the following frequency.

(A) Routine nitrate monitoring frequency. All public water systems shall routinely monitor for nitrate.

(i) All public water systems shall annually sample at each groundwater entry point to the distribution system.

(ii) A community or nontransient, noncommunity water system shall sample quarterly at each surface water entry point to the distribution system.

(iii) A transient, noncommunity water system shall sample annually at each surface water entry point to the distribution system.

(B) Reduced nitrate monitoring frequency. The executive director may reduce the monitoring frequency for community or nontransient, noncommunity water systems using surface water sources by granting a waiver to the routine monitoring frequency.

(i) To be considered for a waiver, a system shall demonstrate that the nitrate concentration in each sample collected during the previous four consecutive quarters was less than 50% of the nitrate MCL.

(ii) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(iii) A system that receives a waiver to the routine nitrate monitoring frequency must sample annually for nitrate. The annual sample must be collected in the quarter that previously resulted in the highest nitrate concentration.

(C) Increased nitrate monitoring frequency. The executive director may increase the nitrate monitoring frequency for community or nontransient, noncommunity water systems using groundwater sources.

(i) A system that is sampling annually shall begin quarterly nitrate sampling if the nitrate concentration in any sample is equal to or greater than 50% of the nitrate MCL. Quarterly sampling must begin the first quarter after the elevated nitrate level was detected.

(ii) After the initiation of quarterly sampling, the executive director may return a system to the routine annual nitrate monitoring frequency if quarterly sampling shows that the system is reliably and consistently below the nitrate MCL for a minimum of four consecutive quarters.

(7) Nitrite monitoring frequency. All public water systems shall monitor for nitrite at the following frequency.

(A) All public water systems shall routinely take one nitrite sample during [the first three years of] each <u>nine-year</u> compliance cycle. <u>All public water systems</u>

shall monitor at the time designated by the executive director during each compliance period during each nine-year compliance cycle. New entry points will be scheduled for nitrite sample collection during the first year of operation, and then every nine years thereafter unless increased nitrite monitoring is required in accordance with this paragraph.

(B) The executive director may reduce the monitoring frequency for nitrite by granting a waiver to the routine monitoring frequency.

(i) To be considered for a waiver, a system shall demonstrate that the nitrite concentration in the initial sample was less than 50% of the nitrite MCL.

(ii) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(iii) A system that receives a waiver to the routine nitrite monitoring frequency must sample at a frequency specified by the executive director.

(C) The executive director may increase the monitoring frequency for nitrite.

(i) A system shall sample quarterly for at least one year following any sample in which the nitrite concentration is greater than or equal to 50% of the MCL.

(ii) The executive director may allow a system to return to the routine monitoring frequency after determining the system is reliably and consistently less than the MCL.

(8) Confirmation sampling for all IOCs. The executive director may require a public water system to confirm the results of any individual sample.

(A) If a sample result exceeds the MCL, a public water system may be required to collect one additional sample to confirm the results of the initial test. If an additional sample is required:

(i) Confirmation samples must be collected at the same entry point to the distribution system as the sample that exceeded the MCL;

(ii) Confirmation samples for IOCs except nitrate and nitrite shall be collected as soon as possible after the system receives the analytical results of the first sample; and

(iii) Confirmation samples for nitrate and nitrite shall be collected within 24 hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the 24-hour sampling requirement must immediately notify the consumers served by the public water system in accordance with subsection (f) of this section. Systems exercising this option must take and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample.

(B) The executive director may require a confirmation sample for any sample with questionable results.

(9) More frequent monitoring. The executive director may require more frequent monitoring than specified in paragraphs (4) - (7) of this subsection.

(d) Analytical requirements for IOCs. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for inorganic contaminants shall be performed at a laboratory certified by the executive director.

(e) Reporting requirements for IOCs. The [Upon the request of the executive director, the] owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within the first ten days following the month

in which the result is received by the public water system, or the first ten days following the end of the required monitoring period as provided by this subsection, whichever occurs first [ten days of the request or within ten days of their receipt by the public water system, whichever is later.] The copies must be mailed to the Texas Commission on Environmental Quality, Water Supply Division, MC 155, P.O. Box 13087, Austin, Texas 78711-3087.

(f) Compliance determination for IOCs. Compliance with this section shall be determined using the following criteria.

(1) Compliance with the MCL for each IOC shall be based on the analytical results obtained at each individual sampling point.

(2) A public water system that exceeds the levels for nitrate, nitrite, or the sum of nitrate and nitrite specified in subsection (b) of this section commits an acute MCL violation. Compliance shall be based on the results of the single sample. If a confirmation sample is collected, compliance shall be based on the average result of the original and confirmation samples.

(3) A public water system that exceeds the levels of antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium (i.e., any IOC except nitrate and nitrite) specified in subsection (b) of this section at any sampling point commits an MCL violation.

(A) For systems that are sampling annually or less frequently, compliance may be based on the results of a single sample, if a confirmation sample is not collected.

(B) For systems that are sampling annually or less frequently, if a confirmation sample is collected, compliance will be based on the average result of the original and confirmation samples.

(C) For systems that are sampling more frequently than annually, compliance is based on the running annual average for each sampling point.

(D) If a single quarterly sample would cause the running annual average to be exceeded, then the system is immediately out of compliance.

(4) Any result below the method detection limits of 40 CFR §141.23(a)(4)(i) shall be considered to be zero for the purpose of calculating compliance.

(5) The executive director may exclude the results of obvious sampling errors from the compliance calculations.

(6) Compliance with the IOC MCLs must be based on the results of all samples required by the executive director, regardless of whether that number is greater or less than the minimum required number.

(7) For purposes of determining compliance, arsenic results must be reported to the nearest 0.001 milligram per liter [mg/L.]

(8) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(g) Public notice for IOCs. A public water system that violates the requirements of this section must notify the executive director and the system's customers.

(1) A public water system that violates the MCL for nitrate, nitrite, or the sum of nitrate and nitrite shall notify the executive director within 24 hours and the water system customers of this acute violation in accordance with the requirements of §290.122(a) of this title (relating to Public Notification).

(2) A public water system that violates the MCL for nitrate, nitrite, or the sum of nitrate and nitrite that is unable to comply with the 24-hour confirmation sampling requirement must immediately notify the consumers served by the public water system in accordance with §290.122(a) of this title.

(3) A public water system that fails to meet the MCL for any of the regulated IOCs except nitrate and nitrite (i.e., antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium) shall notify the executive director by the end of the next business day and the water system customers in accordance with the requirements of §290.122(b) of this title.

(4) A public water system that fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(5) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the executive director may allow the system to give public notice to only the area served by that portion of the system that is out of compliance.

(h) Best available technology (BAT) for IOCs. BAT for treatment of violations of MCLs in subsection (b) of this section are listed in 40 CFR §141.62.

(i) Small system compliance technologies (SSCTs) for arsenic. SSCTs for arsenic are listed in 40 CFR §141.62(d) and may be utilized with commission approval. When point-of-use or point-of-entry devices are used for compliance, the water system must develop a program for the long-term operation, maintenance, and monitoring of the devices to ensure adequate performance.

(j) Bottled water. In accordance with 40 CFR §141.101, bottled water may be used on a temporary basis only and with approval by the commission in order to avoid unreasonable risk to health.

§290.107. Organic Contaminants.

(a) Applicability. All community and nontransient, noncommunity water systems shall comply with the requirements of this section regarding organic contaminants. For purposes of this section, systems using groundwater under the direct influence of surface water shall meet the organic sampling requirements given for surface water systems.

(b) Maximum contaminant levels (MCLs) for organic contaminants. The concentration of synthetic and volatile organic chemicals shall not exceed the MCLs specified in this section.

(1) The following are MCLs for synthetic organic chemical (SOC) contaminants.

Figure: 30 TAC §290.107(b)(1) (No change to the figure as it currently exists in TAC.)

Contaminant	**MCL (mg/L)**
Alachlor	0.002
Atrazine	0.003
Benzopyrene	0.0002
Carbofuran	0.04
Chlordane	0.002
Dalapon	0.2
Dibromochloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.006
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.0004
Heptachlor epoxide	0.0002
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.04
Oxamyl (Vydate)	0.2
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated biphenyls	0.0005
(PCB)	0.004
Simazine	0.003
Toxaphene	3×10^{-8}
2,3,7,8-TCDD (Dioxin)	0.05
2,4,5-TP	0.07
2,4-D	

(2) The following are MCLs for volatile organic chemical (VOC) contaminants.

Figure: 30 TAC §290.107(b)(2) (No change to the figure as it currently exists in TAC.)

Contaminant	MCL (mg/L)
1,1-Dichloroethylene	0.007
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
1,2-Dichloroethane	0.005
1,2-Dichloropropane	0.005
1,2,4-Trichlorobenzene	0.07
Benzene	0.005
Carbon tetrachloride	0.005
cis-1,2-Dichloroethylene	0.07
Dichloromethane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
o-Dichlorobenzene	0.6
para-Dichlorobenzene	0.075
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
trans-1,2-Dichloroethylene	0.1
Trichloroethylene	0.005
Vinyl chloride	0.002
Xylenes (total)	10

(3) Each public water system must certify annually to the executive director (using third-party or manufacturer's certification) that when acrylamide or epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed 0.05% dosed at 1.0 milligrams per liter (mg/L) (or equivalent) for acrylamide and 0.01% dosed at 20 mg/L (or equivalent) for epichlorohydrin.

(c) Monitoring requirements for organic contaminants. Public water systems shall monitor for organic contaminants at the locations and frequency in paragraphs (1) and (2) of this subsection. All monitoring conducted under the requirements of this section must be conducted at sites designated in the public water system's monitoring plan. All samples must be taken during periods of normal operation.

(1) SOC monitoring requirements. Monitoring of the SOC contaminants shall be conducted at the frequency and locations given in this paragraph.

(A) SOC monitoring locations. Monitoring of the SOC contaminants shall be conducted at the following locations.

(i) Systems shall routinely sample at sample sites representative of each entry point to the distribution system.

(ii) Subsequent samples must be taken at the same sample site unless the executive director determines that a change in conditions makes a different sample site more representative of the water available to customers.

(iii) The executive director must approve any change in sampling location.

(B) Initial SOC monitoring frequency. Prior to using a new source of water as drinking water, public water systems shall monitor at the frequency established by the executive director to ensure that the water distributed to customers will comply with the MCLs for SOCs.

(C) Routine SOC monitoring frequency. Monitoring of the SOC contaminants shall be conducted at the following frequency.

(i) Community and nontransient, noncommunity water systems shall take four consecutive quarterly samples for each SOC contaminant listed in subsection (b)(1) of this section during each compliance period beginning with the initial compliance period.

(ii) Community and nontransient, noncommunity water systems serving more than 3,300 persons that do not detect a contaminant in the initial

compliance period may reduce the sampling frequency at that sample site to a minimum of two consecutive quarterly samples in one year during each repeat compliance period.

(iii) Community and nontransient, noncommunity water systems serving 3,300 persons or fewer that do not detect a contaminant in the initial compliance period may reduce the sampling frequency at that sample site to a minimum of one sample during each repeat compliance period.

(iv) Each public water system shall monitor at the time designated by the executive director within each compliance period.

(D) Increased SOC monitoring. The executive director may change the monitoring frequency for SOCs.

(i) Entry points that exceed the SOC MCLs of subsection (b)(1) of this section as determined by subsection (f) of this section must be monitored quarterly. After a minimum of four quarterly samples shows the system is in compliance and the executive director determines the system is reliably and consistently below the MCL, as determined by the methods specified in subsection (f) of this section, the executive director may allow the system to monitor annually. Systems that monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(ii) The executive director may change the monitoring frequency if an organic SOC contaminant is detected in any sample.

(I) If an organic SOC contaminant is detected in any sample, the system must monitor quarterly at each entry point to the distribution system at which a detection occurs.

(II) After a system collects a minimum of two consecutive quarterly samples at a groundwater sample site, the executive director may decrease the quarterly monitoring requirement specified in subclause (I) of this clause, if the sample site is reliably and consistently below the MCL.

(III) After a system collects a minimum of four consecutive quarterly samples at a surface water sample site or a groundwater under the direct influence of surface water sample site, the executive director may decrease the quarterly monitoring requirement specified in subclause (I) of this clause, if the sample site is reliably and consistently below the MCL.

(IV) After the executive director determines that a sample site is reliably and consistently below the MCL, the executive director may allow the sample site to be monitored annually. Systems that monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(V) Sample sites that have three consecutive annual samples with no detection of a contaminant may be granted a waiver at the discretion of the executive director. The executive director will consider the waiver for each compliance period.

(VI) If monitoring results in detection of one or more of certain related contaminants (i.e., heptachlor and heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.

(iii) The executive director may increase the required SOC monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source, etc.).

(iv) The executive director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the executive director, the result must be averaged with the first sampling result and the average used for the compliance determination as specified in subsection (f) of this section. The executive director has discretion to delete results of obvious sampling errors from this calculation.

(E) Waivers for SOC monitoring. The executive director may grant a waiver to reduce the SOC monitoring frequency from the monitoring frequency requirements of subparagraphs (B) and (C) of this paragraph, based on previous use of

the contaminant within the watershed or zone of influence of the water source. Examples of use of a contaminant include transport, storage, or disposal. If a determination by the executive director reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If the executive director cannot determine whether the contaminant has been used in the watershed or if the contaminant has been used previously, then the following factors shall be used to determine whether a waiver is granted:

(i) previous analytical results;

(ii) the proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at drinking water sources, manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources include the use of pesticides to control insects, weeds, or pests on agricultural areas, forest lands, home and garden property, or other land application uses;

(iii) the environmental persistence and transport of the pesticide herbicide or contaminant;

(iv) how well the water source is protected against contamination due to such factors as depth of the well, type of soil, and the integrity of

well construction. Surface water systems must consider watershed vulnerability and protection;

(v) elevated nitrate levels at the water supply source; and

(vi) use of polychlorinated byphenyls (PCBs) in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

(F) Compositing for SOC monitoring. The executive director may reduce the total number of samples required from a system for analysis by allowing the use of compositing. Composite samples from a maximum of five entry points to the distribution system are allowed. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(i) If any of the SOC contaminants listed in subsection (b)(1) of this section are detected in a composite sample, then a follow-up sample must be taken from each entry point to the distribution system included in the composite and analyzed within 14 days of collection.

(ii) If duplicates of the original SOC sample taken from each entry point to the distribution system used in the composite are available, the executive

director may use these duplicates instead of resampling. The duplicate must be analyzed within 14 days of collection and the results reported to the executive director.

(iii) Compositing may only be permitted at entry points to the distribution system within a single system.

(2) VOC monitoring requirements. Monitoring of the VOC contaminants shall be conducted at the frequency and locations given in this paragraph.

(A) VOC monitoring locations. Monitoring of the VOC contaminants shall be conducted at the following locations.

(i) Systems shall routinely sample at sample sites representative of each entry point to the distribution system.

(ii) Subsequent samples must be taken at the same sample site unless the executive director determines that a change in conditions makes a different sample site more representative of the water available to customers.

(iii) The executive director must approve any change in sampling location.

(B) Initial VOC monitoring frequency. Prior to using water as a drinking water source, public water systems shall monitor at the frequency established by the executive director to ensure that the water distributed to customers will comply with the MCLs for VOCs.

(C) Routine VOC monitoring frequency. Monitoring of the VOC contaminants shall be conducted at the following frequency.

(i) Community and nontransient, noncommunity water systems shall take four consecutive quarterly samples for each VOC contaminant listed in subsection (b)(2) of this section during each compliance period, beginning with the initial compliance period.

(ii) If the initial monitoring for VOC contaminants has been completed, and the system did not detect any VOC contaminant listed in subsection (b)(2) of this section, the system shall take one sample annually beginning with the initial compliance period.

(iii) After a minimum of three years of annual sampling, the executive director may allow groundwater systems with no previous detection of any VOC contaminant listed in subsection (b)(2) of this section to take one sample during each compliance period.

(iv) Each community and nontransient, noncommunity groundwater system that does not detect a VOC contaminant listed in subsection (b)(2) of this section may be granted a waiver from the annual or triennial requirements of subsection (c)(2)(C)(ii) and (iii) of this section after completing the initial monitoring. For the purposes of this section, detection is defined as an analytical result of 0.0005 mg/L or greater. A waiver shall be effective for no more than six years (two compliance periods).

(v) Each public water system shall monitor at the time designated by the executive director within each compliance period.

(D) Increased VOC monitoring. The executive director may change the monitoring frequency for VOCs.

(i) Sample sites that exceed the VOC MCLs of subsection (b)(2) of this section, as determined by subsection (f) of this section, must be monitored quarterly. After a minimum of four consecutive quarterly samples that show the system is in compliance as specified in subsection (f) of this section and after the executive director determines that the system is reliably and consistently below the MCL, the executive director may allow the system to monitor annually during the quarter that previously yielded the highest analytical result.

(ii) The executive director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the executive

director, the result must be averaged with the first sampling result and the average is used for the compliance determination as specified by subsection (f) of this section. The executive director has discretion to delete results of obvious sampling errors from this calculation.

(iii) If a VOC contaminant listed in subsection (b)(2) of this section is detected at a level exceeding 0.0005 mg/L in any sample, then:

(I) the system must monitor quarterly at each entry point to the distribution system that resulted in a detection;

(II) the executive director may decrease the quarterly monitoring requirement specified in subsection (c)(2)(D)(iii)(I) of this section provided that the executive director has determined that the system is reliably and consistently below the MCL. In no case shall the executive director make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples;

(III) if the executive director determines that the system is reliably and consistently below the MCL, the executive director may allow the system to monitor annually. Systems that monitor annually must monitor during the quarter that previously yielded the highest analytical result;

(IV) systems which have three consecutive annual samples with no detection of a contaminant may be granted a waiver as specified in subparagraph (E) of this paragraph; and

(V) groundwater systems that have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each entry point to the distribution system at which one or more of the two-carbon organic compounds was detected. If the result of the first analysis does not detect vinyl chloride, the executive director may reduce the quarterly monitoring frequency for vinyl chloride to one sample during each compliance period. Surface water systems are required to monitor for vinyl chloride as specified by the executive director.

(iv) The executive director may increase the required VOC monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source, etc.).

(E) Waivers for VOC monitoring. The executive director may grant a waiver after evaluating the previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the water sources. If a determination by the executive director reveals no previous use of the contaminant

within the watershed or zone of influence, a waiver may be granted. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted:

(i) previous analytical results;

(ii) the proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at drinking water sources manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities;

(iii) the environmental persistence and transport of the contaminants;

(iv) the number of persons served by the public water system and the proximity of a smaller system to a larger system;

(v) how well the water source is protected against contamination (e.g., is it a surface or groundwater system). Groundwater systems must consider factors such as depth of the well, the type of soil, and well construction. Surface water systems must consider watershed protection;

(vi) as a condition of the waiver, a groundwater system must take one sample at each entry point to the distribution system during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its vulnerability assessment considering the factors listed in this paragraph. Based on this updated vulnerability assessment, the executive director must reconfirm that the system is not vulnerable. If the executive director does not make this reconfirmation within three years of the initial determination, then the waiver is invalid and the system is required to sample annually; and

(vii) community and nontransient surface water systems that do not detect a VOC contaminant listed in subsection (b)(2) of this section may be considered by the executive director for a waiver from the annual sampling requirements of subparagraph (C)(ii) of this paragraph after completing the initial monitoring. Systems meeting this criteria must be determined by the executive director to be non-vulnerable based on a vulnerability assessment during each compliance period. Each system receiving a waiver shall sample at the frequency specified by the executive director (if any).

(F) Compositing for VOC monitoring. The executive director may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of entry points to the distribution system are allowed. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(i) If the VOC concentration in the composite sample is 0.0005 mg/L or greater for any contaminant listed in subsection (b)(2) of this section, then a follow-up sample must be taken and analyzed within 14 days from each entry point to the distribution system included in the composite.

(ii) If duplicates of the original sample taken from each entry point to the distribution system used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed within 14 days of collection.

(iii) Compositing may only be permitted by the executive director at entry points to the distribution system within a single system.

(iv) Procedures for compositing VOC samples are as stated in 40 Code of Federal Regulations (CFR) §141.24(f)(14)(iv).

(d) Analytical requirements for organic contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for organic contaminants shall be performed at a laboratory certified by the executive director.

(e) Reporting requirements for organic contaminants. The [Upon the request of the executive director, the] owner or operator of a public water system must provide the

executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within the first ten days following the month in which the result is received by the public water system, or the first ten days following the end of the required monitoring period as provided by this subsection, whichever occurs first [of the request or within ten days of their receipt by the public water system, whichever is later]. The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(f) Compliance determination for organic contaminants. Compliance with the MCLs of subsection (b)(1) and (2) of this section shall be determined based on the analytical results obtained at each entry point to the distribution system.

(1) If one sampling point is in violation of any MCL in subsection (b) of this section, then the system is in violation of the MCL for that contaminant.

(A) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

(B) Systems monitoring annually or less frequently whose sample result exceeds the MCL must begin quarterly sampling; systems will not be considered in violation of the MCL until they have completed one year of quarterly sampling

(C) If any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.

(D) If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

(E) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

(2) The executive director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by sanctioned representatives and agencies.

(3) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(g) Public notification requirements for organic contaminants. A public water system that violates the requirements of this section must notify the executive director and the system's customers. If a public water system has a distribution system separate from other parts of the distribution system with no interconnections, the executive director may allow the system to give public notice to only that portion of the system that is out of compliance.

(1) A system that violates an MCL given in subsection (b) of this section, shall report to the executive director and notify the public as provided under §290.122(b) of this title (relating to Public Notification).

(2) A public water system that fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(h) Best available technology for organic contaminants. Best available technology for treatment of violations of MCLs in subsection (b) of this section are listed in 40 CFR §141.61. Copies are available for review in the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

§290.108. Radionuclides Other than Radon.

(a) Applicability. All community water systems shall comply with the requirements of this section regarding radionuclide contaminants. Public water systems treating groundwater under the direct influence of surface water must comply with the radionuclide requirements for surface water systems. Public water systems shall comply with the initial monitoring requirements.

(b) Maximum contaminant levels (MCL). The concentration of radionuclide contaminants in the water entering the distribution system shall not exceed the following MCLs.

(1) MCLs for naturally occurring radionuclides are as follows:

(A) 5 picoCuries per liter (pCi/L) for combined radium-226 and radium-228, as calculated by the summation of the results for radium-226 and radium-228;

(B) 15 pCi/L for gross alpha particle activity (including radium-226 but excluding radon and uranium); and

(C) 30 micrograms per liter [(µg/L)] for uranium.

(2) MCLs for beta particle and photon radioactivity from man-made radionuclides in drinking water in community water systems are equivalent to the MCLs under 40 Code of Federal Regulations (CFR) §141.66(d), as amended and adopted in the CFR through December 7, 2000 (65 FR 76708), which is adopted by reference.

(c) Monitoring requirements. Public water systems shall measure the concentration of radionuclides at locations and frequencies specified in the system's monitoring plan. All samples must be collected during normal operating conditions.

(1) Monitoring frequency for naturally occurring radionuclides. The monitoring frequency requirements for gross alpha particle activity, combined radium-226 and radium-228, and uranium are as follows.

(A) Initial monitoring frequency. All systems that use a new source of water must begin to conduct initial monitoring of the new source within 90 days after initiating use of the source.

(i) If the initial monitoring results are at or above an MCL, the system must perform quarterly monitoring as described in subparagraph (C) of this paragraph.

(ii) If the initial monitoring results are below all of MCLs given in subsection (b)(1) of this section, the system shall perform routine monitoring as described in subparagraph (B) of this paragraph.

(B) Routine monitoring. The results of samples collected during initial and routine monitoring periods will be used to determine the monitoring frequency for subsequent monitoring periods.

(i) If the results for all contaminants (gross alpha particle activity, combined radium-226 and radium-228, and uranium) are below the detection

limits specified in Table A of this clause, the system must collect and analyze at least one sample at that sampling point once every nine years.

Figure: 30 TAC §290.108(c)(1)(B)(i) (No change to the figure as it currently exists in TAC.)

Table A: Detection Limits for Radionuclides

Contaminant	**Detection limit**
Gross alpha particle activity	3 picoCuries per liter (pCi/L)
Radium 226	1 pCi/L
Radium 228	1 pCi/L
Uranium	1 microgram per liter

(ii) If the result for any contaminant is at or above the detection limit but at or below one-half the MCLs given in subsection (b) of this section, the system must collect and analyze at least one sample at that sampling point every six years.

(iii) If the result for any contaminant is above one-half the MCLs given in subsection (b) of this section but below the MCL, the system must collect and analyze at least one sample at that sampling point every three years.

(iv) If the result for any contaminant is at or above any of the MCLs given in subsection (b) of this section, monitoring must be performed at the frequency given in subparagraph (C) of this paragraph.

(C) Increased monitoring. A system must perform increased monitoring if any results at a sampling point are at or above the MCLs, or at the direction of the executive director.

(i) If the results for any contaminant are at or above any of the MCLs given in subsection (b) of this section, consecutive quarterly monitoring must be performed at that sample point.

(ii) If the average of quarterly monitoring results is less than the MCLs in subsection (b) of this section, the sample point may be returned to the routine sampling frequency given in subparagraph (B) of this paragraph.

(iii) To fulfill quarterly monitoring requirements a system may composite up to four consecutive quarterly samples from a single entry point if analysis is done within a year of the first sample.

(iv) The analytical results from a composite sample will be treated as the annual average to determine compliance with the MCLs and future monitoring frequency requirements.

(v) When required by the executive director, more frequent monitoring must be conducted in the vicinity of mining or other operations that may contribute alpha particle radioactivity to either surface or groundwater sources of drinking water, or when changes in the distribution system or treatment processing occur that may increase the concentration of radionuclide in the finished water.

(vi) Community public water systems shall conduct monitoring when required by the executive director.

(D) Historical data. A system may use historical data to comply with the initial monitoring requirement, if approved by the executive director.

(i) A system having only one entry point to the distribution system may use the monitoring data from the previous entry point or distribution system compliance monitoring to satisfy initial monitoring requirements.

(ii) A system with multiple entry points that has appropriate historical monitoring data for each entry point to the distribution system may use previous compliance monitoring data to satisfy initial monitoring requirements.

(iii) To satisfy initial monitoring requirements, a community water system with appropriate historical data for a representative point in the

distribution system may use the monitoring data from the distribution system, provided that the executive director finds that the historical data satisfactorily demonstrates that each entry point to the distribution system is expected to be in compliance based upon the historical data and reasonable assumptions about the variability of contaminant levels between entry points.

(E) Sample invalidation. The executive director may invalidate the results of obvious sampling or analytic errors.

(F) Confirmation samples. The executive director may require more frequent monitoring or may require confirmation samples at the executive director's discretion.

(G) Sampling scheduling. Systems shall monitor at the time designated by the executive director.

(2) Monitoring and compliance for man-made radionuclides. The monitoring and compliance requirements for man-made radionuclide under 40 CFR §141.26(b), as amended and adopted in the CFR through December 7, 2000 (65 FR 76708), are adopted by reference.

(3) Monitoring locations for radionuclide contaminants. Systems must monitor at sample sites described in the system's monitoring plan.

(A) Initial monitoring for a new water source must be conducted at a site representative of the water quality of the new source of water.

(B) Routine compliance monitoring for the radionuclide covered by this section must be performed at sampling points representing each entry point to the distribution system. If results from an entry point exceed one-half the MCL, the executive director may require the system to sample all water sources providing water to that entry point.

(d) Analytical requirements for radionuclide contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for radionuclide contaminants shall be performed at a laboratory certified by the executive director.

(e) Reporting requirements. The [Upon the request of the executive director the] owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this section. The copies must be submitted within the first ten days following the month in which the result is received by the public water system, or the first ten days following the end of the required monitoring period as provided by this subsection, whichever occurs first [of the request or within ten days of their receipt by the public water system, whichever is later].

The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(f) Compliance determination. Compliance with the requirements of this section shall be determined as follows.

(1) If the running average annual MCL for gross alpha particle activity, combined radium-226 and radium-228, or uranium as set forth in subsection (b) of this section is exceeded, based on quarterly monitoring results, the system has committed an MCL violation.

(A) A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis provided that the measured gross alpha particle activity does not exceed 5 pCi/L at a confidence level of 95% (1.65 theta where theta is the standard deviation of the net counting rate of the sample).

(B) When the gross alpha particle activity exceeds 5 pCi/L, the same or an equivalent sample shall be analyzed for radium-226 and radium-228.

(C) If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, one-half the detection limit will be used to calculate the annual average.

(D) The results of all samples taken and analyzed under the provisions of this section will be used in determining compliance, even if that number is greater or less than the minimum required.

(E) If a system fails to complete required increased monitoring, the executive director may base compliance on all available sample results.

(F) If the results at one sample site are in violation, the public water system is in violation.

(G) When confirmation samples are collected, the average of an initial sample and its confirmation sample must be averaged for the purposes of determining compliance.

(H) To judge compliance with the MCLs, sample results must be rounded to the same number of significant figures as the MCL for the substance in question.

(2) If the average annual MCL [maximum contaminant level] for man-made radionuclide set forth in subsection (b) of this section is exceeded, the system has committed an MCL violation.

(3) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation.

(4) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

(5) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(g) Public notification. A public water system that violates the requirements of this section must notify the executive director and the system's customers, as follows.

(1) A public water system that violates the MCL for gross alpha particle activity, combined radium-226 and radium-228, or uranium shall give notice to the executive director and notify the public as required by §290.122(b) of this title (relating to Public Notification).

(2) The operator of a community water system that violates the MCL for man-made radionuclide shall give notice to the executive director and to the public as required by §290.122(b) of this title.

(3) A public water system that fails to conduct the monitoring required by this subsection must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(h) Best available technology for radionuclides other than radon. Best available technology for treatment of violations of MCLs in subsection (b) of this section are listed in 40 CFR §141.66(g).

(i) Small system compliance technologies (SSCTs) for radionuclides. SSCTs for radionuclides are listed in 40 CFR §141.66(h) and may be utilized with commission approval. When point-of-use or point-of-entry devices are used for compliance, the water system must develop a program for the long-term operation, maintenance, and monitoring of the devices to ensure adequate performance.

(j) Bottled water. In accordance with 40 CFR §141.101, bottled water may be used on a temporary basis only and with approval by the commission in order to avoid unreasonable risk to health.

§290.109. Microbial Contaminants.

(a) Applicability. All public water systems must produce and distribute water that meets the provisions of this section regarding microbial contaminants.

(b) Maximum contaminant levels (MCL) for microbial contaminants. Treatment techniques and MCL requirements for microbial contaminants are based on detection of those contaminants or fecal indicator organisms.

(1) A public water system is in compliance with the MCL for *Escherichia coli* (*E. coli*) unless any of the following conditions occur: [The MCL for microbial contaminants in the distribution system is based on the presence of total or fecal coliform bacteria in routine, repeat, and increased monitoring distribution samples.]

(A) The public water system has an *E. coli*-positive repeat sample following a total-coliform-positive routine sample; [For a system which collects at least 40 routine distribution samples per month, the MCL is defined as when more than 5.0% of samples collected in a month are coliform positive.]

(B) The public water system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample; [(B) For a system which collects fewer than 40 routine distribution samples per month, the MCL is defined as when more than one sample is coliform positive.]

(C) The public water system fails to take all required repeat samples following an *E. coli*-positive routine sample; or [(C) The acute MCL is defined as when a repeat sample is fecal coliform or *Escherichia coli* (*E. coli*) positive; or a total coliform positive repeat sample follows a fecal coliform or *E. coli* positive routine sample.]

(D) The public water system fails to test for *E. coli* when any repeat sample tests positive for total coliform.

(E) The *E. coli* MCL is defined as when a condition described in subparagraphs (A) - (D) of this paragraph occurs.

(2) For public water systems required to collect raw groundwater samples, the standard is no detection of fecal indicators in a raw groundwater sample [samples].

(c) Treatment technique triggers and assessment requirements for microbial contaminants. All public water systems shall comply with the requirements as described in this subsection. Public water systems shall conduct assessments after exceeding any of the treatment technique triggers as described in paragraphs (1) and (2) of this subsection.

(1) Level 1 treatment technique triggers are:

(A) For a public water system which collects 40 or more distribution samples per month, the treatment technique trigger is defined as when more than 5.0% of samples collected in a month are total coliform-positive.

(B) For a public water system which collects fewer than 40 distribution samples per month, the treatment technique trigger is defined as when two or more samples collected in a month are total coliform-positive.

(C) When a public water system fails to collect all required repeat samples after a total coliform-positive result.

(2) Level 2 treatment technique triggers are:

(A) An *E. coli* MCL violation as specified in subsection (b)(1)(A) - (D) of this section occurs.

(B) A second Level 1 treatment technique trigger occurs as defined in paragraph (c)(1) of this section, within a rolling 12-month period. If the executive director has determined the reason that the samples that caused the first Level 1 treatment technique trigger were total coliform-positive and has established that the public water system has corrected the problem, a public water system will not be required to conduct and complete a Level 2 assessment. The public water system shall have identified any sanitary defect and provided adequate documentation to the executive director in the initial Level 1 assessment which established the reason that caused the first Level 1 treatment technique trigger and that the public water system corrected the problem. If the executive director has determined that a public water system is not required to conduct a Level 2 assessment based on the occurrence of a second Level 1 treatment

technique trigger within a rolling 12-month period, the public water system shall still conduct the required Level 1 assessment.

(3) Treatment technique assessment requirements are:

(A) Level 1 and Level 2 assessments are conducted in order to identify the possible presence of sanitary defects and defects in distribution system coliform monitoring practices. The assessments may also indicate that no sanitary defects were identified. When conducting assessments, systems shall ensure that the assessor evaluates minimum elements that include review and identification of inadequacies in sample sites; sampling protocol; sample processing; atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including, but not limited to water storage); source and treatment considerations that bear on distributed water quality; and existing water quality monitoring data. The system shall conduct and complete the assessment in the format as prescribed by the executive director that tailors specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

(i) Level 1 and Level 2 assessments shall be conducted and completed by the public water system, licensed operators as required under §290.46(e) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water

Systems), or other parties approved by the executive director. The public water system, licensed operators, as required under §290.46(e) of this title, and other parties approved by the executive director shall have also completed any training required by the executive director in writing, upon notice to the public water system, licensed operators, and other parties approved by the executive director.

(ii) Other parties approved by the executive director include, but are not limited to:

(I) backflow prevention assembly testers and customer service inspectors licensed under Chapter 30 of this title (relating to Occupational Licenses and Registrations);

(II) plumbing inspectors and water supply protection specialists licensed by the Texas State Board of Plumbing Examiners;

(III) licensed professional engineers licensed by the Texas Board of Professional Engineers;

(IV) circuit riders or technical assistance providers under contract with the executive director or other government agency as approved by the executive director; or

(V) utility supervisor or manager supported by various utility staff or other individuals that meet the assessment requirements as described in this paragraph.

(B) The Level 1 and Level 2 assessments shall be conducted and completed consistent with all directives set forth by the executive director and with respect to the size, type, and characteristics of the public water system. When conducting assessments, at a minimum, public water systems shall ensure that the following items are evaluated:

(i) review and identification of inadequacies in sample sites;

(ii) sampling protocol;

(iii) sample processing;

(iv) atypical events that could affect distributed water quality or indicate that distributed water quality was impaired;

(v) changes in distribution system maintenance and operation that could affect distributed water quality (including, but not limited to water storage);

(vi) source and treatment considerations that bear on distributed water quality, where appropriate; and

(vii) existing water quality monitoring data.

(C) A public water system shall conduct a Level 1 assessment when the public water system exceeds one of the treatment technique triggers in paragraph (1) of this subsection.

(i) A Level 1 assessment shall be completed and submitted to the executive director as soon as practical, but in no case later than 30 days after the public water system learns that it has exceeded a trigger.

(ii) If the executive director determines that the Level 1 assessment is not sufficient, the public water system shall consult with the executive director and submit a revised assessment form to the executive director within 30 days from the date of consultation.

(iii) The executive director will determine if the public water system has identified a cause of the trigger and, if so, was the cause corrected, or has an acceptable schedule to correct the problem been included.

(D) A public water system shall ensure that a Level 2 assessment is conducted consistently with all directives set forth by the executive director if the public water system exceeds one of the treatment technique triggers in paragraph (2) of this subsection. The public water system shall comply with any expedited actions or additional actions required by the executive director in the case of an *E. coli* MCL violation.

(i) The public water system shall ensure that a Level 2 assessment is completed by the public water system, licensed operators as required under §290.46(e) of this title, or by parties approved by the executive director as soon as practical after any trigger in paragraph (2) of this subsection. The public water system shall submit a completed executive director-approved Level 2 assessment form to the executive director within 30 days after the public water system learns that it has exceeded a trigger.

(ii) If the executive director determines that the completed Level 2 assessment is not sufficient or the proposed timetable for any corrective actions not completed is not sufficient, the public water system shall consult with the executive director. If any revisions are required after consultation, the public water system shall submit a revised assessment form to the executive director within 30 days.

(iii) After the Level 2 assessment is submitted, the executive director will determine if the public water system has identified the cause of the trigger and corrected the cause, or has included an acceptable timetable for correcting the cause.

(E) Public water systems must correct sanitary defects found through either Level 1 or Level 2 assessments described in this subsection. For corrective actions not completed by the time of submission of the assessment form, the public water system must complete the corrective actions in compliance with a timetable approved by the executive director in consultation with the public water system. The public water system must notify the executive director when scheduled corrective actions have been completed.

(F) At any time during the assessment or corrective action phase, either the public water system or the executive director may request a consultation with the other party to determine the appropriate actions. The public water system shall consult with the executive director on all relevant information that may impact its ability to comply with a requirement of this subsection.

(d) [(c)] Monitoring requirements for microbial contaminants. Public water systems shall collect samples for total coliform, fecal coliform, *E. coli* (or other approved fecal indicator) [*E. coli*, or other fecal indicator organisms] at sampling sites and a sample collection schedule, as designated by the public water system, which are subject to review and revision [locations and frequency] as directed by the executive director. All

compliance samples must be collected at sampling sites and a sample collection schedule that are representative of water throughout the distribution system and shall be reflected in the public water system's Sample Siting Plan and included with the public water system's monitoring plan in accordance with §290.121 of this title (relating to Monitoring Plans). All public water systems shall develop a written Sample Siting Plan as described in paragraph (6) of this subsection [during normal operating conditions].

(1) Routine microbial sampling locations. Public water systems shall routinely monitor for microbial contaminants at the following locations.

(A) Public water systems must collect routine distribution coliform samples at a customer's premise, dedicated sampling station, or other designated compliance sampling location at active service connections which are representative of water quality throughout the distribution system. Other sampling sites may be used if located adjacent to active service connections.

(B) Public water systems shall collect distribution coliform samples at locations specified in the public water system's Sample Siting Plan which shall be included in the public water system's monitoring plan.

(2) Routine distribution coliform sampling frequency. All public [Public] water systems must sample for distribution coliform at the following frequency. [:]

(A) Community and noncommunity public water systems must collect routine distribution coliform samples at a frequency based on the population served by the system.

(i) The [the] population for noncommunity systems will be based on the maximum number of persons served on any given day during the month based on the data reported by the public water system to the executive director during the most recent sanitary survey of the public water system or any other data as required by the executive director. [;]

(ii) The [the] population of community systems will be based on the data reported by the public water system to the executive director during the most recent sanitary survey of the public water system or any other data as required by the executive director. [; and]

(iii) The [the] minimum sampling frequency for public water systems is shown in the following table.

Figure: 30 TAC §290.109(d)(2)(A)(iii)

[Figure: 30 TAC §290.109(c)(2)(A)(iii)]

Population Served	Minimum Number of Samples per Month
1 to 1,000	1
1,001 to 2,500	2
2,501 to 3,300	3

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

(B) A public water system which uses surface water or groundwater under the direct influence of surface water must collect routine distribution coliform samples at regular time intervals throughout the month.

(C) A public water system which uses only [uses only] purchased water or groundwater not under the direct influence of surface water and serves more

than 4,900 persons must collect routine distribution coliform samples at regular time intervals throughout the month.

(D) A public water system which uses only purchased water or groundwater not under the direct influence of surface water and serves 4,900 persons or fewer may collect all required routine distribution coliform samples on a single day if they are taken from different sites.

(E) A total coliform-positive sample invalidated under this subsection does not count towards meeting the minimum routine monitoring requirements of this subsection.

(F) All public water system shall collect at least the minimum number of required routine microbial samples even if the public water system has had an *E. coli* MCL violation under any of the conditions as described in subsection (b)(1)(A) - (D) of this section or has exceeded the coliform treatment technique triggers as described in subsection (c)(1) and (2) of this section. [If a system collecting fewer than five routine distribution coliform samples per month has one or more total coliform-positive samples and the executive director does not invalidate the sample(s) in accordance with subsection (d)(1) of this section, it must collect at least five routine distribution coliform samples during the next month the system provides water to the public.]

(G) A public water system may conduct more microbial compliance monitoring than is required by this subsection to investigate potential problems in the public water system treatment facilities and distribution system and use monitoring to assist in identifying problems. A public water system may collect more than the minimum number of required routine samples required by this subsection. A public water system that collects more than the minimum number of required routine samples required by this subsection shall include the results of these samples in calculating whether the coliform treatment technique triggers as described in subsection (c)(1) and (2) of this section have been exceeded. The additional routine sample sites shall be included in the public water system's Sample Siting Plan and collected in accordance with the Sample Siting Plan and shall be representative of water throughout the distribution system.

(3) Repeat distribution coliform sampling requirements. Public water systems [Systems] shall conduct repeat monitoring if one or more of the routine samples is found to contain coliform organisms.

(A) If a routine distribution coliform sample is coliform-positive, the public water system must collect a set of repeat distribution coliform samples within 24 hours of being notified of the positive result, or as soon as possible if the local laboratory is closed. The executive director may extend the 24-hour limit on a case-by-case basis if the public water system has a logistical problem in collecting the repeat samples within

24 hours that is beyond the public water system's control. All public water systems shall collect no fewer than three repeat samples for each total coliform-positive sample found.

[(i) A system which collects more than one routine distribution coliform sample per month must collect no fewer than three repeat samples for each coliform-positive sample found.]

[(ii) A system which collects one routine distribution coliform sample per month must collect no fewer than four repeat samples for each coliform-positive sample found.]

(B) The public water system must collect all repeat samples on the same day, except a public water system with a single service connection may collect daily repeat samples over a three-day period until the required number of repeat samples has been collected.

(C) Unless the public water system meets the provisions of clause (i) or (ii) of this subparagraph, the public water [The] system must collect at least one repeat sample from the sampling tap where the original coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. [If a fourth repeat sample is required, it must be collected within five service connections upstream or downstream.] If the positive routine sample was

collected at the end of the distribution system, or one service connection away from the end of the distribution system, [line] one repeat sample must be collected at that point and all other samples must be collected within five connections upstream of that point.

(i) As approved by the executive director, public water systems may propose repeat monitoring locations to the executive director that the public water system considers to be representative of a pathway for contamination of the distribution system. A public water system may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a written standard operating procedure (SOP) in its Sample Siting Plan. The public water system shall design its SOP to focus the repeat samples at locations that best verify and determine the extent of potential contamination of the distribution system area based on specific situations. The executive director may modify the SOP or require alternative monitoring locations as needed.

(ii) As approved by the executive director, groundwater public water systems serving 1,000 or fewer people may propose repeat sampling locations to the executive director, in a written SOP in its Sample Siting Plan, that differentiate potential source water and distribution system contamination (e.g., by sampling at entry points to the distribution system). A groundwater public water system with a single well required to conduct triggered source water monitoring may, with written executive director approval, take one of its repeat samples at the monitoring location required for triggered source water monitoring under paragraph (4) and (4)(A) of this subsection if the

public water system demonstrates to the executive director that the Sample Siting Plan remains representative of water quality in the distribution system. If approved by the executive director, the public water system may use that sample result to meet the monitoring requirements for both repeat monitoring under this paragraph and triggered source monitoring under paragraph (4) and (4)(A) of this subsection.

(iii) All public water systems shall include all sample sites as required by this subparagraph and any required SOPs for any proposed sampling sites as described in clauses (i) and (ii) of this subparagraph in the public water system's Sample Siting Plan in accordance with paragraph (6) of this subsection.

(D) If one or more repeat samples in the set is total coliform-positive, the public water system must collect an additional set of repeat samples in the manner specified in subparagraphs (A) - (C) of this paragraph. The additional samples must be collected within 24 hours of the public water system being notified of the positive result or as soon as possible if the local laboratory is closed. The executive director may extend the 24-hour limit on a case-by-case basis if the public water system has a logistical problem in collecting the repeat samples within 24 hours that is beyond the public water system's control. The public water system must repeat this process until either one of the following occurs:

(i) total coliforms are not detected in one complete set of repeat samples:

(ii) a coliform treatment technique trigger as described in subsection (c)(1) and (2) of this section has been exceeded; or

(iii) If a treatment technique trigger as described in subsection (c)(1) and (2) of this section is exceeded as a result of a routine sample being total coliform-positive, public water systems are required to conduct only one round of repeat monitoring for each total coliform-positive routine sample. [or the system determines that the MCL for total coliforms has been exceeded.]

(E) After a public water system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample is found to contain total coliform bacteria, then the public water system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(4) General requirements for raw [Raw] groundwater source monitoring. Groundwater systems must comply, unless otherwise noted, with the requirements of this section. Any raw groundwater source sample required under this paragraph must be collected at a location prior to any treatment of the groundwater source and use analytical procedures and methods described in §290.119(b)(10) of this title (relating to Analytical Procedures). The public water system may collect a sample at an executive director-approved location prior to any treatment to meet the requirements of this

paragraph and subparagraph (A) of this paragraph if the sample is representative of the water quality of that well.

(A) Triggered source monitoring general [General] requirements. A groundwater system must conduct triggered source water monitoring for *E. coli* (or other approved fecal indicator) [indicators], if both of the following conditions exist.

(i) The system does not provide at least 4-log treatment of viruses (as defined in §290.103(44) [§290.103(39)] of this title (relating to Definitions)) before the first customer for each groundwater source; and

(ii) The system is notified that a routine distribution coliform sample is positive and the sample is not invalidated under subsection (e)(1) [(d)(1)] of this section.

(B) Triggered source monitoring sampling [Sampling] requirements. A groundwater system must collect, within 24 hours of notification of the routine distribution total coliform-positive sample, at least one raw groundwater source *E. coli* (or other approved fecal indicator) sample from each groundwater source in use at the time the distribution coliform-positive sample was collected.

(i) The executive director may extend the 24-hour time limit on a case-by case basis if the system cannot collect the raw groundwater source sample within 24 hours due to circumstances beyond its control.

(ii) If approved by the executive director and documented in the public water system's monitoring plan, public water systems with more than one groundwater source may be allowed to sample a representative groundwater source or sources. Public water systems shall [Systems must] modify their current monitoring plan to identify one or more groundwater sources that are representative of each distribution coliform sampling site and is intended to be used for representative source sampling.

(iii) A groundwater system with a single well serving 1,000 people or fewer may use one of the three required repeat samples collected from a raw groundwater source to meet both the repeat requirements of paragraph (3) of this subsection and the triggered raw source monitoring requirements in this paragraph. If a required repeat sample is used to meet both requirements and found to be *E. coli* positive, the public water system will have achieved an *E. coli* MCL as defined in subsection (b)(1)(A) - (D) of this section and corrective action will be required for the groundwater source where the sample was found to be *E. coli* positive. [A groundwater system serving 1,000 people or fewer may use one of the four required repeat samples collected from a raw groundwater source to meet both the repeat requirements of subparagraph (A)(ii) of this paragraph and the triggered raw source monitoring requirements in this paragraph. If a required repeat sample is used to meet both

requirements and found to be *E. coli* positive, the system will have achieved an acute MCL as defined in subsection (b)(1)(C) of this section and corrective action will be required for the groundwater source were the sample was found to be *E. coli* positive.]

(iv) If the executive director does not require corrective action under §290.116 of this title (relating to Groundwater Corrective Actions and Treatment Techniques) for a fecal indicator positive source water sample collected under subparagraph (B) of this paragraph that is not invalidated under subsection (e) of this section, the public water system shall collect five additional source water samples from the same source within 24 hours of being notified of the fecal indicator positive sample.

(v) If a public water system takes more than one repeat sample at the monitoring location required for triggered source water monitoring, the public water system may reduce the number of additional source water samples required under subsection (d)(4)(B)(iv) of this section by the number of repeat samples taken at that location that were not *E. coli* positive.

(C) Consecutive and wholesale systems. Consecutive groundwater systems receiving drinking water from a wholesaler must notify the wholesale system(s) within 24 hours of being notified of the positive coliform distribution sample. The wholesale groundwater system(s) must comply with the following:

(i) A wholesale groundwater system that receives notice of a distribution coliform sample positive from a consecutive system it serves must collect a sample from each of its groundwater sources within 24 hours of the notification and analyze each sample for the presence of *E. coli* (or other approved fecal indicator).

(ii) If any raw source sample is *E. coli* (or other approved fecal indicator) positive, the wholesale groundwater system must notify all consecutive systems served by that groundwater source of the fecal indicator positive within 24 hours of being notified. The wholesale system and all consecutive systems served by that groundwater source must notify their water system customers in accordance with subsection (h)(2) [(g)(2)] of this section and shall meet the requirements of subsection (d)(4)(B)(iv) of this section.

(iii) If any raw source sample is *E. coli* positive, the wholesale groundwater system shall notify all consecutive systems served by that groundwater source of the fecal indicator source water positive within 24 hours of being notified and shall meet the requirements of subsection (d)(4)(B)(iv) of this section.

(D) Exceptions to the triggered source monitoring requirements. A groundwater system is not required to comply with the triggered source monitoring requirements if any of the following conditions exist.

(i) The executive director determines and documents in writing, that the distribution coliform-positive [coliform positive] sample is caused by a distribution system deficiency; or

(ii) The distribution coliform-positive [coliform positive] sample is collected at a location that meets the distribution coliform sample invalidation criteria as specified in subsection (e)(1) [(d)(1)] of this section and the replacement sample is negative for coliforms.

(E) Assessment source monitoring. The executive director may require monthly source assessment raw monitoring without the presence of a positive total coliform distribution sample if well conditions exist that indicate the groundwater may be susceptible to fecal contamination. The executive director may conduct a hydrogeological sensitivity assessment to determine if the source is susceptible to fecal contamination. If requested by the executive director, groundwater systems must provide the executive director with any existing information that will enable the executive director to perform a hydrogeological sensitivity assessment. A groundwater system conducting assessment source monitoring may use a triggered source sample collected under paragraph (4)(A) of this subsection [subparagraph (B) of this paragraph] to meet the assessment source monitoring requirement. A groundwater system with a groundwater source sample collected under this subparagraph or under paragraph (4)(A) of this subsection that is fecal indicator positive and that is not invalidated under subsection (e)(2) of this section, including consecutive systems served by the groundwater source,

shall conduct public notification under §290.122(a) of this title (relating to Public Notification). Additionally, an assessment source monitoring sample may be used as a triggered source monitoring sample if collected within 24 hours of notification of the coliform-positive distribution sample. Assessment source monitoring requirements may include:

(i) Source monitoring, collected in a manner described in §290.119(b)(10) of this title, for a period of 12 months that represents each month that the system provides groundwater to the public from the raw groundwater source or such time period as specified by the executive director.

(ii) Collection of samples from each well unless the system has an approved triggered source monitoring plan under subparagraph (B)(ii) of this paragraph.

(5) Culture analysis. If any routine or repeat sample is total coliform-positive, that total coliform-positive medium will be analyzed to determine if *E. coli* are present. If *E. coli* are present, the public water system shall notify the executive director by the end of the day in accordance with subsection (h) of this section. [If any routine or repeat sample is total coliform-positive, that total coliform-positive culture medium will be analyzed to determine if fecal coliforms or bacteria are present. If fecal coliforms or *E. coli* are present, the system must notify the executive director by the end of the day in accordance with subsection (g) of this section.]

(6) Sample Siting Plan requirements. All public water systems shall develop and complete a written Sample Siting Plan as described in this paragraph that identifies routine and repeat microbial sampling sites and a sample collection schedule as required by this subsection that are representative of water throughout the distribution system. The Sample Siting Plan shall include all groundwater sources and any associated sampling points necessary to meet the requirements of this subsection. The Sample Siting Plan shall be included as a part of the public water system's monitoring plan as described in §290.121 of this title. Sample Siting Plans shall be completed in a format specified by the executive director and are subject to review and revision by the executive director.

(A) All public water systems shall collect routine and repeat samples according to a written Sample Siting Plan. All routine and repeat sample site locations and any sampling point locations necessary to meet the requirements of this subsection shall be reflected in the written Sample Siting Plan.

(B) All public water systems shall include any required SOP for any proposed repeat sampling sites as described in paragraph (3)(C) of this subsection in the Sample Siting Plan. As required by the executive director, the executive director may review, revise, and approve any repeat sampling proposed by public water systems under paragraph (3)(C) of this subsection.

(C) The Sample Siting Plan shall include a distribution system map which identifies distribution system valves and mains as described in §290.46(n)(2) of this title. The distribution system map shall also include the location of all routine microbial sample sites, water main sizes, entry point source locations, water storage facilities, and any pressure plane boundaries.

(D) All public water systems shall update their written Sample Siting Plan and map as necessary, or as requested by the executive director, to identify the most current microbial routine and repeat sampling sites and a sample collection schedule that are representative of water throughout the public water system's distribution system.

(E) All public water systems shall maintain a copy of their updated Sample Siting Plan and map on-site at the public water system for inspection purposes and at the request of the executive director, provide a copy of their Sample Siting Plan and/or map to the executive director for review and/or revision purposes.

(e) [(d)] Analytical and invalidation requirements for microbial contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title. Testing for microbial contaminants shall be performed at a laboratory certified by the executive director.

(1) Distribution coliform sample invalidation. The executive director may invalidate a distribution total coliform-positive sample if one of the following conditions is met.

(A) The executive director may invalidate a sample if the laboratory provides written notice that improper sample analysis caused the total coliform-positive result.

(B) The executive director may invalidate a sample if the results of repeat samples collected, as required by this section, determine that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The executive director cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected within five service connections of the original tap are total coliform-negative. Under those circumstances, the system may [cease resampling and] request that the executive director invalidate the sample. The system must provide copies of the routine positive and all repeat samples.

(C) The executive director may invalidate a sample if there are substantial grounds to believe that the total coliform-positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required by this section, and

use them to determine compliance with the *E. coli* MCL as described [for total coliforms] in subsection (g) of this section and whether a coliform treatment technique trigger has been exceeded as described in subsection (c) [(f)] of this section. The system must provide written documentation which must state the specific cause of the total coliform-positive sample, and the action the system has taken, or will take, to correct this problem. The executive director may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(D) The executive director may invalidate a sample if the laboratory provides written notice that the sample was unsuitable for analysis.

(E) If a sample is invalidated by the laboratory, the public water system must collect another sample from the same location as the original sample within 24 hours of being notified, or as soon as possible if the laboratory is closed, and have it analyzed for the presence of total coliform. The system must continue to resample within 24 hours and have the samples analyzed until it obtains a valid result.

(2) A groundwater system may obtain invalidation of a fecal indicator positive groundwater source sample if the conditions of subparagraphs (A) and (B) of this paragraph apply. If the executive director invalidates a fecal indicator positive groundwater source sample, the system must collect another source sample as specified in subsection (d)(4) [(c)(4)] of this section within 24 hours of being notified of the invalidation.

(A) Notice from the laboratory must document that improper sample analysis occurred. If a laboratory invalidates a sample, the system must collect another sample from the same location as the original sample within 24 hours of being notified of the invalidated sample, and have it analyzed for the presence of *E. coli* (or other approved fecal indicator). The public water system must continue to re-sample within 24 hours and have the samples analyzed until it obtains a valid result. If approved by the executive director, the 24-hour time limit may be extended.

(B) The executive director may invalidate the sample if the public water system provides written documentation that there is substantial evidence that a fecal indicator positive groundwater source sample is not related to source water quality. If the executive director invalidates a sample, the public water system must collect another sample from the same location as the original sample within 24 hours of being notified of the invalidated sample, and have it analyzed for the presence of *E. coli* (or other approved fecal indicator).

(f) [(e)] Reporting requirements for microbial contaminants. The [Upon the request of the executive director, the] owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within the first ten days following the month in which the result is received by the public water system, or the first ten days following the end of the required monitoring period as provided by this

subsection, whichever occurs first [of the request or within ten days of their receipt by the public water system, whichever is later]. The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(g) [(f)] Compliance determination for microbial contaminants. Compliance with the requirements of this section shall be determined using the following criteria each month that the system is in operation.

(1) A public water system commits an *E. coli* MCL violation if any of the following conditions occur: [A system commits an acute MCL violation if:]

(A) The public water system has an *E. coli*-positive repeat samples following a total coliform-positive routine sample; [A repeat distribution system sample is fecal coliform-positive or *E.coli*-positive; or]

(B) The public water system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample; [A total coliform-positive repeat distribution system sample follows a fecal coliform-postive or *E. coli*-positive routine distribution system sample.]

(C) The public water system fails to take all required repeat samples following an *E. coli*-positive routine sample; or

(D) The public water system fails to test for *E. coli* when any repeat sample tests positive for total coliform.

(E) The executive director, pursuant to 40 Code of Federal Regulations §141.63(e), recognizes the following as the best technology, treatment techniques, or other means available for achieving compliance with the MCL for *E. coli* as described in subparagraphs (A) - (D) of this paragraph:

(i) protection of wells from fecal contamination by appropriate placement and construction;

(ii) maintenance of a disinfectant residual throughout the distribution system;

(iii) proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks and reservoirs, cross-connection control, and continual maintenance of positive water pressure in all parts of the distribution system;

(iv) filtration and disinfection of surface water, as described in this chapter, or disinfection of groundwater, as described in chapter, using strong oxidants such as chlorine, chlorine dioxide, or ozone;

(v) for systems using groundwater, development and implementation of a Wellhead Protection Program, as directed by the executive director, and in accordance with the federal Safe Drinking Water Act, United States Code, §1428; and

(vi) the executive director may require additional best technology, treatment techniques, or other means available for achieving compliance with the MCL for *E. coli* as described in subparagraphs (A) - (D) of this paragraph.

(2) If all repeat samples taken for triggered source water monitoring are *E. coli* -negative and a repeat sample taken at a monitoring location other than the one required for triggered source water monitoring is *E. coli* -positive, the public water system has violated the *E. coli* MCL, but is not required to comply with subsection (d)(4)(B)(v) of this section. If a public water system takes more than one repeat sample at the monitoring location required for triggered source water monitoring under subsection (d)(4) of this section, and more than one repeat sample is *E. coli*-positive, the public water system has violated the *E. coli* MCL and shall also comply with the treatment technique and corrective action requirements as described in §290.116 of this title. [A system that collects at least 40 routine distribution coliform samples per month commits a nonacute MCL violation if more than 5.0% of the samples collected during a month are total coliform-positive, but none of the initial or repeat samples are fecal coliform-positive or *E. coli*-positive.]

[(3) A system that collects fewer than 40 routine distribution coliform samples per month commits a nonacute MCL violation if more than one sample collected during a month is total coliform-positive, but none of the initial or repeat samples are fecal coliform-positive or *E. coli*-positive.]

(3) [(4)] A public groundwater system that is required to collect raw source samples is required to conduct corrective action as described in §290.116 of this title [(relating to Groundwater Corrective Actions and Treatment Techniques)] and is required to provide public notification in accordance with §290.122(a) of this title [(relating to Public Notification)] if a source sample is confirmed positive for *E. coli* or other approved fecal indicators.

(4) [(5)] A public water system that fails to collect every required routine or additional routine sample in a compliance period and/or to submit the analytical results to the executive director commits a monitoring violation [to provide the required number of suitable distribution coliform samples commits a monitoring violation].

(5) A public water system that fails to analyze for *E. coli* following a total coliform-positive routine sample commits a monitoring violation.

(6) A public water system that fails to monitor in accordance with the requirements of subsection (d)(4) [(c)(4)] of this section commits a monitoring violation and must provide public notification in accordance to §290.122 of this title.

(7) A public water system that fails to report the results of the monitoring tests required by this section commits a reporting violation.

(8) A public water system that fails to do a required public notice or certify that notification has been performed commits a public notice reporting violation.

(9) The results of all routine and repeat distribution coliform samples not invalidated by the executive director shall be included in determining compliance with the *E. coli* MCL as described in paragraph (1)(A) - (D) of this subsection and whether a coliform treatment technique trigger has been exceeded as described in subsection (c) of this section. [Results of all routine and repeat distribution coliform samples not invalidated by the executive director must be included in determining compliance with the MCL for total coliforms.]

(10) The results of all routine and repeat distribution [Distribution] coliform samples invalidated by the executive director shall not be included in determining compliance with the *E. coli* MCL as described in paragraph (1)(A) - (D) of this subsection and whether a coliform treatment technique trigger has been exceeded as described in subsection (c) of this section [MCL for total coliforms].

(11) Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for microbiological contaminants.

(12) All seasonal public water systems shall complete executive director-approved start-up procedures and certification and maintain a copy of the start-up procedures and certification on-site at the public water system for inspection purposes. At the executive director's request, seasonal public water systems shall submit a copy of the start-up procedures and certification to the executive director for review purposes. Failure by a seasonal public water system to complete executive director-approved start-up procedures prior to serving water to the public is a treatment technique violation. Failure by a seasonal public water system to maintain or submit certification of completion of executive director-approved start-up procedures is a reporting violation.

(13) A public water system commits a treatment technique violation when a seasonal public water system fails to complete an executive director-approved start-up procedure prior to serving water to the public.

(14) A public water system commits a treatment technique violation when a public water system exceeds a treatment technique trigger specified in subsection (c) of

this section and then fails to conduct the required assessment or corrective actions within the timeframe specified in subsection (c) of this section.

(15) A public water system required to conduct an assessment under the provisions of subsection (c) of this section shall submit the assessment report to the executive director within 30 days. The public water system shall notify the executive director in accordance with subsection (c) of this section when scheduled corrective actions are complete and for corrective actions not completed by the time of submission of the assessment form. For corrective actions not completed by the time of submission of the assessment form to the executive director, the public water system shall complete corrective actions in compliance with a timetable approved by the executive director in consultation with the public water system. The assessment may also indicate that no sanitary defects were identified.

(h) [(g)] Public notification for microbial contaminants. A public water system that is out of compliance with the requirements described in this section must notify the public using the procedures described in §290.122 of this title for microbial contamination.

(1) A public water system that commits an acute MCL violation for microbial contaminants must notify the public water system customers in accordance with the boil water notice requirements of §290.46(q) of this title [(relating to Minimum Acceptable

Operating Practices for Public Drinking Water Systems)] and the public notice requirements of §290.122(a) of this title.

(2) A public groundwater system that receives an *E. coli* (or other approved fecal indicator) positive source sample that has not been invalidated by the executive director, or a notice of an *E. coli* (or other approved fecal indicator) positive source sample from a wholesale system, including consecutive systems, must notify the public water system customers within 24-hours in accordance with the requirements of §290.122(a) of this title and include notice in the next Consumer Confidence Report for community public water systems or provide as a special notice for noncommunity systems in accordance with §290.272(g)(7) of this title (relating to Content of the Report) for community public water systems and §290.116(f)(2) of this title for noncommunity public water systems. Consecutive systems must issue public notice in accordance with §290.122(g) of this title. The public water system must continue to notify the public annually until the fecal contamination in the source water is determined by the executive director to be corrected as specified under §290.116 of this title.

(3) A public water system that has [fecal coliforms or] *E. coli* (or other approved fecal indicator) present must notify the executive director by the end of the day when the public water system is notified of the test result, unless the public water system is notified of the result after the commission's office is closed, in which case the public water system must notify the executive director before the end of the next business day.

(4) A public water system which commits an MCL violation must report the violation to the executive director immediately after it learns of the violation, but no later than the end of the next business day, and notify the public in accordance with §290.122(b) of this title.

(5) A public water system which commits an *E. coli* MCL violation shall report the violation to the executive director immediately after it learns of the violation, but no later than the end of the next business day, and notify the public in accordance with §290.122(a) of this title.

(6) [(5)] A public water system which has failed to comply with a coliform monitoring requirement must report the monitoring violation to the executive director within ten days after the system discovers the violation and notify the public in accordance with §290.122(c) of this title.

(7) A public water system that has violated the treatment technique for coliforms in subsection (c)(1) and (2) of this section commits a treatment technique violation as described in subsection (g)(15) of this section and shall report the violation to the executive director no later than the end of the next business day after it learns of the violation, and notify the public in accordance with §290.122(b) of this title.

§290.110. Disinfectant Residuals.

(a) Applicability. All public water systems shall properly disinfect water before it is distributed to any customer and shall maintain acceptable disinfectant residuals within the distribution system.

(b) Minimum and maximum acceptable disinfectant concentrations. All public [Public] water systems shall provide the minimum levels of disinfectants in accordance with the provisions of this section. Public water systems shall not exceed the maximum residual disinfectant levels (MRDLs) provided in this section.

(1) The disinfection process used by public water systems must ensure that water has been adequately disinfected before it enters the distribution system.

(A) The disinfection process used by public water systems treating surface water sources or groundwater sources that are under the direct influence of surface water must meet the requirements of §290.111(d) of this title (relating to Surface Water Treatment).

(B) The executive director may require the disinfection process used by public water systems treating groundwater sources that are not under the direct influence of surface water to meet the requirements of §290.116 of this title (relating to Groundwater Corrective Actions and Treatment Techniques).

(C) The disinfection process at other types of treatment plants shall provide the level of disinfection required by the executive director.

(2) The residual disinfectant concentration in the water entering the distribution system shall be at least 0.2 milligram per liter (mg/L) free chlorine or 0.5 mg/L chloramine (measured as total chlorine).

(3) The chlorine dioxide residual of the water entering the distribution system shall not exceed an MRDL of 0.8 mg/L.

(4) The residual disinfectant concentration in the water within the distribution system shall be at least 0.2 mg/L free chlorine or 0.5 mg/L chloramine (measured as total chlorine).

(5) The running annual average of the free chlorine or chloramine residual (measured as total chlorine) of the water within the distribution system shall not exceed an MRDL of 4.0 mg/L.

(c) Monitoring requirements. All public [Public] water systems shall monitor the performance of the disinfection facilities to ensure that appropriate disinfectant levels are maintained. All monitoring conducted pursuant to the requirements of this section must be conducted at sites designated in the public water system's monitoring plan.

(1) Entry point compliance monitoring for surface water and groundwater under the direct influence of surface water. Public water systems that treat surface water or groundwater under the direct influence of surface water must verify that they meet the disinfection requirements of subsection (b)(2) of this section.

(A) Public water systems that treat surface water or groundwater under the direct influence of surface water and sell treated water on a wholesale basis or serve more than 3,300 people must continuously monitor and record the disinfectant residual of the water at each entry point. If there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

(B) Public water systems that treat surface water or groundwater under the direct influence of surface water, serve 3,300 or fewer people and do not sell treated water on a wholesale basis must monitor and record the disinfectant residual of the water at each entry point with either continuous monitors or grab samples.

(i) If a system uses grab samples, the samples must be collected on an ongoing basis at the frequency prescribed in the following table.

Figure: 30 TAC §290.110(c)(1)(B)(i) (No change to the figure as it currently exists in TAC.)

Entry Point Disinfectant Residual Monitoring
Frequency for Grab Samples

System Size by Population	Samples/day
500	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

(ii) The grab samples cannot be taken at the same time and the sampling interval is subject to the executive director's review and approval.

(iii) Treatment plants that use grab samples and fail to detect an appropriate disinfectant residual must repeat the test at four-hour or shorter intervals until compliance has been reestablished.

(C) Continuous monitors must record the disinfectant residual of the water every 30 minutes.

(2) Entry point compliance monitoring for groundwater and purchased water. Public water systems that treat groundwater or that purchase and resell treated water must, upon the request of the executive director, verify that they meet the disinfection requirements of subsection (b)(2) of this section.

(A) A public water system that uses free chlorine must measure free chlorine.

(B) A public water system that has a chloramine residual must measure total chlorine.

(3) Chlorine dioxide compliance monitoring. Each treatment plant using chlorine dioxide must monitor and record the chlorine dioxide residual of the water entering the distribution system at least once each day. If the chlorine dioxide residual in the water entering the distribution system exceeds the MRDL contained in subsection (b)(3) of this section, the treatment plant must conduct additional tests.

(A) If the public water system does not have additional chlorination facilities in the distribution system, it must conduct three additional tests at the service connection nearest the treatment plant where an elevated chlorine dioxide residual was detected. The first additional test must be conducted within two hours after detecting an elevated chlorine dioxide residual at the entry point to the distribution system. The two subsequent tests must be conducted at six-hour to eight-hour intervals thereafter.

(B) If the public water system has additional chlorination facilities in the distribution system, it must conduct an additional test at the service connection nearest the treatment plant where an elevated chlorine dioxide residual was detected, an additional test at the first service connection after the point where the water is

rechlorinated, and an additional test at a location in the far reaches of the distribution system. The additional test at the location nearest the treatment plant must be conducted within two hours after detecting an elevated chlorine dioxide residual at the entry point to the distribution system. The two other tests must be conducted at six-hour to eight-hour intervals thereafter.

(4) Distribution system compliance monitoring. All public [Public] water systems shall monitor the disinfectant residual at various locations throughout the distribution system.

(A) Public water systems that use groundwater or purchased water sources only and serve fewer than 250 connections and fewer than 750 people daily, must monitor the disinfectant residual at representative locations in the distribution system at least once every seven days.

(B) Public water systems that serve at least 250 connections or at least 750 people daily, and use only groundwater or purchased water sources must monitor the disinfectant residual at representative locations in the distribution system at least once per day.

(C) Public water systems using surface water sources or groundwater under the direct influence of surface water must monitor the disinfectant residual tests at least once per day at representative locations in the distribution system.

(D) All public water systems must monitor the residual disinfectant concentration each time and at the same sampling site that a bacteriological sample is collected, as specified in §290.109 of this title (relating to Microbial Contaminants) in addition to the residual disinfectant concentration monitoring requirements as described in this subsection and chapter.

(E) All public water systems with a chloramine residual must monitor the total chlorine residual downstream of any chlorine and ammonia injection points, in conjunction with the chloramine effectiveness sampling in paragraph (5)(C) of this subsection, in the distribution system weekly and whenever the chemical dose is changed.

(5) Chloramine effectiveness sampling. Public water systems with a chloramine residual shall monitor to ensure that monochloramine is the prevailing chloramine species and that nitrification is controlled. Sample sites and procedures used for chloramine effectiveness sampling must be documented in the system's nitrification action plan (NAP) required by §290.46(z) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems). Sample results determined by monitoring required under this paragraph will not be used to determine compliance with the maximum contaminant levels, MRDLs, action levels, or treatment techniques of this subchapter.

(A) Source water. Public water systems must monitor source water (including raw and treated purchased water) to establish baseline ammonia, nitrite, and nitrate levels (all as nitrogen) at least once to determine the availability of ammonia for chloramine formation and to provide a reference for downstream nitrite and nitrate levels that may indicate nitrification. If any source has more than 0.5 mg/L free ammonia (as nitrogen) in the initial sample, then raw water ammonia (as nitrogen) shall be monitored monthly for six months to determine the baseline free ammonia level.

(B) Water entering distribution system. All public [Public] water systems that have chloramines present shall perform sampling to represent the water entering the distribution system.

(i) Total chlorine, free ammonia (as nitrogen) and monochloramine shall be monitored weekly at all entry points to the distribution system or at a location before the first customer.

(ii) Nitrite and nitrate (as nitrogen) levels at the first customer shall be monitored monthly for at least six months to determine baseline nitrite and nitrate levels in the water prior to consumption. Nitrite and nitrate samples collected at the first customer will not be used for compliance with §290.106 of this title (relating to Inorganic Contaminants).

(iii) Nitrite and nitrate (as nitrogen) shall be monitored quarterly at the first customer after establishing the baseline. Nitrite and nitrate samples collected at entry points for compliance with §290.106 of this title may be used for these quarterly samples.

(C) Treatment sampling. Public water systems that inject chlorine at any location to form chloramines or to convert from chloramines to free chlorine must monitor to ensure that chemical addition is effective and the proper chlorine to ammonia (as nitrogen) ratio is achieved. Samples must be collected and analyzed weekly and whenever the chemical dosage is changed.

(i) Sampling must be performed upstream of the chlorine or ammonia chemical injection point, whichever is furthest upstream.

(ii) Sampling must be performed downstream of all the chlorine and ammonia chemical injection points.

(iii) The residual of the chemical injected upstream must be determined to properly dose the downstream chemical where sample taps are present or required under §290.42(e)(7)(C)(ii) of this title (relating to Water Treatment).

(iv) The total chlorine, ammonia (as nitrogen), and monochloramine residuals must all be monitored if the treatment occurs before the entry point.

(v) The ammonia (as nitrogen) and monochloramine residuals must all be monitored if the treatment occurs in the distribution system. The monitoring must occur at the same time as a compliance sampling required under paragraph (4)(E) of this subsection.

(D) Distribution system. Public water systems that distribute water and have a chloramine residual must ensure the efficacy of disinfection within the distribution system.

(i) Monochloramine and free ammonia (as nitrogen) must be monitored weekly at the same time as a compliance sample required under paragraph (4) of this subsection.

(ii) Nitrite and nitrate (as nitrogen) must be monitored quarterly.

(d) Analytical requirements. All monitoring required by paragraphs (1) and (2) of this subsection must be conducted at a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to

Analytical Procedures). All monitoring for chloramine effectiveness required by paragraphs (3) - (6) of this subsection must be analyzed to the accuracy provided therein.

(1) The free chlorine or chloramine residual (measured as total chlorine) must be measured to a minimum accuracy of plus or minus 0.1 mg/L. Color comparators may be used for distribution system samples only. When used, a color comparator must have current reagents, an unfaded and clear color comparator, a sample cell that is not discolored or stained, and must be properly stored in a cool, dark location where it is not subjected to conditions that would result in staining. The color comparator must be used in the correct range. If a sample reads at the top of the range, the sample must be diluted with chlorine-free water, then a reading taken and the resulting residual calculated.

(2) The chlorine dioxide residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using <u>a method that conforms to the requirements of §290.119 of this title. The DPD-glycine method using a colorimeter or spectrophotometer may be utilized only with the written permission of the executive director.</u> [one of the following methods:]

[(A) the amperometric titration method using a titrator with platinum-platinum electrodes;]

[(B) the spectrophotometric Lissamine Green B method; or]

[(C) with the written permission of the executive director, the DPD-glycine method using a colorimeter or spectrophotometer.]

(3) The free ammonia level must be measured to a minimum accuracy of plus or minus 0.1 mg/L.

(4) The monochloramine level must be measured to a minimum accuracy of plus or minus 0.15 mg/L using a procedure that has the ability to distinguish between monochloramine and other forms of chloramine.

(5) The nitrate (as nitrogen) level must be measured to a minimum accuracy of plus or minus 0.1 mg/L.

(6) The [the] nitrite (as nitrogen) level must be measured to a minimum accuracy of plus or minus 0.01 mg/L.

(e) Reporting requirements. Any owner or operator of a public water system subject to the provisions of this section is required to report to the executive director the results of any test, measurement, or analysis required by this section.

(1) Public water systems [Systems] exceeding the MRDL for chlorine dioxide in subsection (b)(3) of this section must report the exceedance to the executive director within 24 hours of the event.

(2) Public water systems that use surface water sources or groundwater sources under the direct influence of surface water must submit a Surface Water Monthly Operating Report (commission Form 0102C), a Surface Water Monthly Operating Report (commission Form 0102D) for alternative technologies, or a Surface Water Monthly Operational Report for Plants That Do Not Have a Turbidimeter on Each Filter (commission Form 0103) each month.

(3) Public water systems that use chlorine dioxide must submit a Chlorine Dioxide Monthly Operating Report (commission Form 0690) each month.

(4) Public water systems that use purchased water or groundwater sources only must complete a Disinfection Level Quarterly Operating Report (commission Form 20067) each quarter.

(A) Community and nontransient, noncommunity public water systems must submit the Disinfection Level Quarterly Operating Report each quarter, by the tenth day of the month following the end of the quarter.

(B) Transient, noncommunity public water systems must retain the Disinfection Level Quarterly Operating Reports and must provide a copy if requested by the executive director.

(5) Systems that use chloramines must retain their NAP required under §290.46(z) of this title and must provide a copy upon request by the executive director.

(6) Monthly and quarterly reports required by this section must be submitted to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087 by the tenth day of the month following the end of the reporting period.

(f) Compliance determinations. Compliance with the requirements of this section shall be determined using the following criteria.

(1) All samples used for compliance must be obtained at sampling sites designated in the monitoring plan.

(A) All samples collected at sites designated in the monitoring plan as microbiological and disinfectant residual monitoring sites shall be included in the compliance determination calculations.

(B) Samples collected at sites in the distribution system not designated in the monitoring plan shall not be included in the compliance determination calculations.

(2) A public water system that fails to conduct the monitoring tests required by this section commits a monitoring violation.

(3) A public water system that fails to report the results of the monitoring tests required by this section commits a reporting violation.

(4) A public water system that uses surface water sources or groundwater sources under the direct influence of surface water and fails to meet the requirements of subsection (b)(2) of this section for a period longer than four consecutive hours commits a nonacute treatment technique violation. A public water system that fails to conduct the additional testing required by subsection (c)(1)(B)(iii) of this section also commits a nonacute treatment technique violation.

(5) A public water system that uses chlorine dioxide and exceeds the level specified in subsection (b)(3) of this section violates the MRDL for chlorine dioxide.

(A) If a public water system violates the MRDL for chlorine dioxide and any of the three additional distribution samples exceeds the MRDL, the system commits an acute MRDL violation for chlorine dioxide.

(B) If a public water system violates the MRDL for chlorine dioxide and fails to collect each of the three additional distribution samples required by

subsection (c)(3) of this section, the system commits an acute MRDL violation for chlorine dioxide.

(C) If a public water system violates the MRDL for chlorine dioxide but none of the three additional distribution samples violates the MRDL, the system commits a nonacute MRDL violation for chlorine dioxide.

(6) A public water system that fails to meet the requirements of subsection (b)(4) of this section, in more than 5.0% of the samples collected each month, for any two consecutive months, commits a nonacute treatment technique violation. Specifically, the system commits a nonacute violation if the value "V" in the following formula exceeds 5.0% per month for any two consecutive months:

Figure: 30 TAC §290.110(f)(6)

$$V = \frac{b \times 100}{a}$$

Where:

a = number of instances where the residual disinfectant concentration is measured during the month; and

b = number of instances during the month where the residual disinfectant concentration is measured but is detected at less than 0.2 milligrams per liter (mg/L) free chlorine or less than 0.5 mg/L chloramine (measured as total chlorine).

(7) A public water system violates the MRDL for chlorine or chloramine (measured as total chlorine) if, at the end of any quarter, the running annual average of monthly averages exceeds the level specified in subsection (b)(5) of this section.

(8) Public water systems [Notwithstanding the MRDLs listed in subsection (b) of this section, operators] shall increase residual disinfectant levels of free chlorine, or chloramines[,] measured as total chlorine, (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections. Public water systems shall consult with the executive director upon increasing residual disinfectant levels in the distribution system in order to maintain compliance with the MRDLs listed in subsection (b) of this section.

(9) If a public water system's failure to monitor makes it impossible to determine compliance with the MRDL for chlorine or chloramines (measured as total chlorine), the system commits an MRDL violation for the entire period covered by the annual average.

(10) A public water system that fails to issue a required public notice or certify that it has issued that notice commits a violation.

(g) Public notification requirements. The owner or operator of a public water system that violates the requirements of this section must notify the executive director and the people served by the system.

(1) A public water system that fails to meet the requirements of subsection (b)(3) of this section, shall notify the executive director within 24 hours of the event and the customers in accordance with the requirements of §290.122 of this title (relating to Public Notification).

(A) A public water system that has an acute violation of the MRDL for chlorine dioxide must notify the customers in accordance with the requirements of §290.122(a) of this title.

(B) A public water system that has a non-acute violation of the MRDL for chlorine dioxide must notify the customers in accordance with the requirements of §290.122(b) of this title.

(2) A public water system that uses surface water sources or groundwater sources under the direct influence of surface water and fails to meet the minimum disinfection requirements of subsection (b)(2) of this section shall notify the executive director by the end of the next business day and the customers in accordance with the requirements of §290.122(b) of this title.

(3) A public water system that fails to meet the requirements of subsection (b)(4) of this section in more than 5.0% of the samples collected each month for two consecutive months must notify its customers in accordance with the requirements of §290.122(b) of this title.

[(A) A public water system that uses surface water or groundwater under the direct influence of surface water must notify its customers in accordance with the requirements of §290.122(b) of this title.]

[(B) A public water system that uses only groundwater or purchased water must notify its customers when it issues its annual consumer confidence report.]

(4) A public water system that fails to meet the requirements of subsection (b)(5) of this section shall notify the executive director by the end of the next business day and the customers in accordance with the requirements of §290.122(b) of this title.

(5) A public water system which fails to conduct the monitoring required by subsection (c)(1) - (4) of this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(6) A public water system that uses chloramines shall notify their retail and wholesale customers of the use of chloramines.

(A) This notification must contain the exact wording included in Appendix H of §290.47 of this title (relating to Appendices).

(B) Prior to initially providing the chloraminated water to its existing customers, the water system must provide notification by mail or direct delivery at least 14 days before the change.

(C) Additionally, the notification must be provided to the news media, hospitals, renal disease facilities, dialysis clinics, physicians, local health departments, and entities which maintain live fish directly by letter, e-mail, or hand delivery.

(D) New customers must also be notified before they begin receiving water from the water system.

(E) Where appropriate, the notice must be multilingual.

§290.111. Surface Water Treatment.

(a) Applicability. A public water system that treats surface water or groundwater under the direct influence of surface water must comply with the requirements of this section.

(1) A public water system that treats surface water must comply with the requirements of this section beginning on the effective date of the rule.

(2) A public water system that treats groundwater under the direct influence of surface water must comply with the requirements of this section beginning on a date specified by the executive director. This compliance date shall not exceed 18 months from the date that the executive director first notifies the system that the groundwater source is under the direct influence of surface water.

(3) A public water system that treats both surface water and groundwater under the direct influence of surface water must meet the compliance date in paragraph (1) of this subsection at plants that treat any surface water and must meet the compliance date in paragraph (2) of this subsection at plants that treat only groundwater under the direct influence of surface water.

(b) Raw surface water monitoring. A public water system that treats surface water or groundwater under the direct influence of surface water must conduct at least two rounds of special raw surface water monitoring at each surface water intake and at each well producing groundwater under the direct influence of surface water for the purpose of establishing minimum treatment technique requirements for *Cryptosporidium* and other pathogens. The executive director may waive the raw surface water monitoring requirements for an intake or a well if the combination of pathogen removal and

disinfection processes used to treat the raw water achieves at least a 5.5-log total removal and inactivation of *Cryptosporidium parvum*.

(1) Raw water monitoring plans. A system must submit a proposed raw surface water monitoring plan when requested by the executive director. The proposed plan must identify all of the system's intakes and wells; provide the location of each raw water sampling point; include the parameters that will be monitored and the frequency and dates that samples will be collected; and specify the laboratories that will perform the analyses. Raw surface water monitoring must be conducted in accordance with a monitoring plan that has been approved by the executive director. The executive director shall not approve a raw surface water monitoring plan unless it indicates that the system will meet the requirements of 40 Code of Federal Regulations (CFR) §§141.701 - 141.707.

(2) Sampling location. A system must collect each raw water sample at a location approved by the executive director. Samples must be collected from the raw water line prior to any treatment and before the first point where a recycled stream is returned to the treatment process.

(3) Sampling parameters and frequency. A system must collect raw water samples at a frequency approved by the executive director.

(A) Unless the executive director approves an alternate sampling regimen, a system must monitor turbidity, *Escherichia coli* (*E. coli*), and *Cryptosporidium*

levels in the raw water at least once each month for a period of not less than 24 consecutive months if the system:

(i) serves at least 10,000 people; or

(ii) is part of combined distribution system in which one or more systems serve at least 10,000 people and the system with the well or intake regularly provides water to another public water supply.

(B) A system that is not required to monitor under subparagraph (A) of this paragraph must either monitor in accordance with the requirements of subparagraph (A) of this paragraph or monitor *E. coli* levels in their raw water at least once every two weeks for a period of not less than 12 consecutive months. A system that does not initially monitor for *Cryptosporidium* and has elevated *E. coli* levels must conduct additional raw water monitoring.

(i) A system must conduct additional monitoring if the average *E. coli* level exceeds 100 colony-forming units per 100 milliliters in the raw water produced by a surface water intake located on a river or flowing stream or the raw water from a well producing groundwater under the direct influence of surface water located closest to a river or flowing stream.

(ii) A system must conduct additional monitoring if the average *E. coli* level exceeds 100 colony-forming units per 100 milliliters in the raw water from a surface water intake not located on a river or flowing stream or the raw water produced by a well producing groundwater under the direct influence of surface water not located on a river or flowing stream.

(iii) A system that must conduct additional monitoring must monitor *Cryptosporidium* levels in the raw water at least twice each month for a period of not less than 12 consecutive months, or at least once each month for a period of not less than 24 consecutive months.

(C) The executive director may approve an alternate sampling frequency for intakes and wells that operate only part of the year.

(4) Sampling schedule and dates. A system must collect raw water samples in accordance with a schedule approved by the executive director.

(A) Except as provided in subparagraph (B) of this paragraph, a system must begin each round of raw source water monitoring no later than the date shown in the following table titled "Raw Source Water Monitoring Schedule."

Figure: 30 TAC §290.111(b)(4)(A) (No change to the figure as it currently exists in TAC.)

Raw Source Water Monitoring Schedule		
Systems that are not part of a combined distribution system[(1)] and serve . . .	must begin the first round of source water monitoring no later than the month beginning . . .	and must begin the second round of source water monitoring no later than the month beginning. . .
At least 100,000 people	October 1, 2006	April 1, 2015
From 50,000 to 99,999 people	April 1, 2007	October 1, 2015
From 10,000 to 49,999 people	April 1, 2008	October 1, 2016
Fewer than 10,000 people and monitor for *E. coli*	October 1, 2008	October 1, 2017
Fewer than 10,000 and monitor for *Cryptosporidium*	April 1, 2010	April 1, 2019
[(1)]Systems that provide treated surface water to another system and are part of a combined distribution system must begin monitoring at the same time as the system in the combined distribution system that has the earliest compliance date.		

(B) If a system installs a new well or intake after the date the first round of raw source water monitoring must begin, the system must:

(i) submit a proposed monitoring schedule for the first round of special raw surface water monitoring no later than three months after first placing the new source in operation; and

(ii) begin the second round of special raw surface water monitoring no later than six years after initial bin classification.

(C) A system must collect a raw water sample no sooner than two days before the date approved by the executive director and no later than two days after

the approved date, unless an extreme condition or situation exists that poses a danger to the sample collector.

(D) A system which is unable to collect a sample within this five-day period must collect the sample as close as possible to the approved date and must notify the executive director in writing why the sample was not collected on the approved date.

(5) Replacement samples. If, for any reason, the laboratory is unable to report a valid analytical result for a scheduled sample, the system must submit a replacement sample on a date approved by the executive director.

(6) Analytical requirements. Raw water samples collected pursuant to this subsection must be analyzed at an United States Environmental Protection Agency (EPA) approved or a Texas Commission on Environmental Quality accredited laboratory.

(A) *Cryptosporidium* samples must be analyzed using one of the methods approved in 40 CFR §141.704(a) and by a laboratory that is approved under EPA's Laboratory Quality Assurance Evaluation Program for Analysis of *Cryptosporidium* in Water.

(B) *E. coli* samples must be analyzed using one of the methods approved in 40 CFR §136.3(a) for the enumeration of *E. coli* in source water and by a laboratory that is accredited by the executive director.

(i) Systems must ensure that samples are maintained between 0 degrees Celsius and 10 degrees Celsius during storage and transportation to the laboratory.

(ii) The time between sample collection and the initiation of the analysis may not exceed 30 hours without the prior approval of the executive director.

(iii) The executive director may allow up to 48 hours between sample collection and the initiation of the analysis if the analysis is conducted by the Colilert reagent version of Standard Method 9223B.

(C) Turbidity samples must be analyzed using a method and at a laboratory approved by the executive director.

(7) Reporting requirements for raw surface water sample results. The owner or operator of a public water system must provide to the executive director with a copy of the results of any test, measurement, or analysis required by this subsection.

(A) Results must be submitted using the Raw Surface Water Sampling Report (commission Form 20358) or in another format that is approved by the executive director and contains the information required by 40 CFR §141.706(e).

(i) If the sample was not collected within the five-day window described in paragraph (4)(C) of this subsection, the result must be accompanied by the information required in paragraph (4)(D) of this subsection.

(ii) If the laboratory report indicates that a valid analytical result could not be reported, the laboratory report must be accompanied by a request to collect a replacement sample.

(B) The results must be submitted within ten days of their receipt by the public water system and no later than ten days after the end of the first month following the month that the sample was collected.

(C) The results and any additional information must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(c) Treatment technique requirements. A system that treats surface water or groundwater under the direct influence of surface water must meet minimum treatment technique requirements before the water reaches the entry point to the distribution system.

(1) The combination of pathogen removal and disinfection processes used by a public water system must achieve at least a 4.0-log removal/inactivation of viruses.

(2) The combination of pathogen removal and disinfection processes used by a public water system must achieve at least a 3.0-log removal/inactivation of *Giardia lamblia*.

(3) A public water system that is required by subsection (b) of this section to conduct raw surface water monitoring must comply with the requirements of this paragraph.

(A) The average *Cryptosporidium* level and bin classification shall be determined in accordance with the requirements established by 40 CFR §141.710.

(i) For systems that collect a total of at least 48 *Cryptosporidium* samples, the average concentration is equal to the arithmetic mean of all sample concentrations.

(ii) For systems that collect a total of at least 24 samples, but not more than 47 *Cryptosporidium* samples, the average concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which *Cryptosporidium* samples were collected.

(iii) For systems that serve fewer than 10,000 people and monitor for *Cryptosporidium* for only one year (i.e., collect 24 samples in 12 months), the average concentration is equal to the arithmetic mean of all sample concentrations.

(iv) For systems with plants operating only part of the year that monitor fewer than 12 months per year under 40 CFR §141.701(e), the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of *Cryptosporidium* monitoring.

(v) If the monthly *Cryptosporidium* sampling frequency varies, systems must first calculate a monthly average for each month of monitoring. Systems must then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification in paragraphs.

(B) Unless otherwise specified in this paragraph, the combination of pathogen removal and disinfection processes must achieve the removal/inactivation of *Cryptosporidium parvum* specified in the following table titled "Treatment Technique Requirements for *Cryptosporidium*," beginning 36 months after being assigned a bin classification by the executive director.

Figure: 30 TAC §290.111(c)(3)(B) (No change to the figure as it currently exists in TAC.)

Treatment Technique Requirements for *Cryptosporidium* [1]		
Average *Cryptosporidium* Level in the Raw Water	**Bin Classification**	**Minimum Removal/Inactivation Requirement**
Cryptosporidium < 0.075 oocysts/L	Bin 1	2.0-log
0.075 oocysts/L ≤ *Cryptosporidium* < 1.0 oocysts/L	Bin 2	4.0-log
1.0 oocysts/L ≤ *Cryptosporidium* < 3.0 oocysts/L	Bin 3	5.0-log
Cryptosporidium ≥ 3.0 oocysts/L	Bin 4	5.5-log

[1]The executive director will assign *Cryptosporidium* removal credit based on the treatment
processes used at the plant:

a) Treatment plants utilizing coagulation, flocculation, and granular media filtration will receive a 2.5-log *Cryptosporidium* removal credit.

b) Treatment plants utilizing coagulation, flocculation, clarification, and granular media filtration will receive a 3.0-log *Cryptosporidium* removal credit.

c) The executive director will assign *Cryptosporidium* removal credit to treatment plants utilizing bag, cartridge, or membrane filters on an individual basis.

(i) A system that conducts the first round of special raw surface water monitoring according to the schedule contained in subsection (b)(4)(A) of this section must comply with the requirements of this paragraph no later than the date shown in the following table, titled "Compliance Date for Existing Sources."

Figure: 30 TAC §290.111(c)(3)(B)(i) (No change to the figure as it currently exists in TAC.)

Compliance Date for Existing Sources

A system that serves . . .	Must comply with the requirements of this paragraph no later than . . .
At least 100,000 people	April 1, 2012
From 50,000 to 99,999 people	October 1, 2012
From 10,000 to 49,999 people	October 1, 2013
Fewer than 10,000 people	October 1, 2014

(ii) A system that conducts the first round of special raw surface water monitoring according to the schedule contained in subsection (b)(4)(B)(i) of this section must comply with the requirements of this paragraph no later than six years after beginning the first round of monitoring on the new source.

(iii) The executive director may allow a system making capital improvements an additional two years to comply with the treatment requirement of this paragraph.

(C) A system that has been assigned to Bin 3 or Bin 4 must achieve at least 1.0-log removal/inactivation of *Cryptosporidium* using one or a combination of the following: bag filters, cartridge filters, chlorine dioxide, membranes, ozone, or ultraviolet light (UV).

(D) Prior to the effective date of subparagraph (B) of this paragraph, the combination of disinfection and filtration processes used by a public water system to

treat for *Cryptosporidium* must achieve at least a 2.0-log removal/inactivation of *Cryptosporidium parvum*.

(4) The combination of disinfection and filtration processes at plants that do not monitor each source in accordance with the requirements of subsection (b) of this section must achieve at least a 5.5-log removal/inactivation of *Cryptosporidium parvum*.

(5) The executive director may require additional levels of treatment in cases of poor source water quality.

(6) The executive director may establish minimum design, operational, and reporting requirements for watershed control programs and treatment processes used to meet the treatment technique requirements of this subsection.

(d) Microbial inactivation requirements. A system that treats surface water or groundwater under the direct influence of surface water must meet minimum disinfection requirements before the water is supplied to any consumer.

(1) Inactivation table. The disinfection process must achieve the minimum microbial inactivation levels shown in the following table.

Figure: 30 TAC §290.111(d)(1) (No change to the figure as it currently exists in TAC.)

Microbial Inactivation Requirements				
	Filter Technology Used			
	Conventional Filters[1]		Membrane Filters and Cartridge Filters[2]	
Pretreatment Provided	*Giardia*	Virus	*Giardia*[3]	Virus
No coagulation	NA[4]	NA[4]	0.0-log	4.0-log
Coagulation and flocculation	1.0-log	3.0-log	0.0-log	3.0-log
Coagulation, flocculation, and clarification	0.5-log	2.0-log	0.0-log	2.0-log

[1]Filters in which water passes through a porous granular media and which utilize depth filtration processes.

[2]Filters in which particulate matter larger than 1 micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism.

[3]The executive director will determine the required *Giardia* inactivation on a case-by-case basis.

[4]NA = Not Allowed. Conventional filtration with no coagulation is not allowed to receive *Giardia* or viral treatment credit.

(A) The disinfection process at treatment plants not described in the Microbial Inactivation Requirements table must provide the level of disinfection required by the executive director.

(B) The executive director may require additional levels of treatment in cases of poor source water quality.

(C) The executive director may reduce the inactivation requirement for plants that meet the individual filter effluent performance criteria contained in subsection (g)(1) of this section and have been assigned a Bin 1 classification under the provisions of subsection (c)(3) of this section.

(D) A system that fails to meet the inactivation requirements of this section for a period of longer than four consecutive hours commits a nonacute treatment technique violation. A system that fails to conduct the additional testing required by paragraph (2)(C) of this subsection also commits a nonacute treatment technique violation.

(E) A system that has a plant assigned a Bin 2, 3, or 4 classification under the provisions of subsection (c)(3) of this section and uses UV disinfection facilities to meet the treatment technique requirements for *Cryptosporidium* must meet the inactivation requirements of this subsection in at least 95% of the water treated each month.

(2) Monitoring requirements for chemical disinfectants. Public water systems must monitor the performance of the disinfection facilities to ensure that appropriate disinfectant levels are maintained. All monitoring conducted pursuant to the requirements of this subsection must be conducted at sites designated in the public water system's monitoring plan.

(A) The disinfectant residual, pH, temperature, and flow rate of the water in each disinfection zone must be measured at least once each day during a time when peak hourly raw water flow rates are occurring.

(B) Disinfection contact time will be based on tracer study data or a theoretical analysis submitted by the system owner or their designated agent and approved by the executive director and the actual flow rate that is occurring at the time that monitoring occurs.

(C) Treatment plants that fail to demonstrate an appropriate level of treatment must repeat these tests at four-hour or shorter intervals until compliance has been reestablished.

(3) Monitoring requirements for UV disinfection facilities. Public water systems must monitor the performance of the UV disinfection facilities.

(A) A system must continuously monitor and record UV intensity as measured by a UV sensor, lamp status, the flow rate through the unit, and other parameters prescribed by the executive director to ensure that the units are operating within validated conditions.

(B) A system with a plant that has been assigned a Bin 2, 3, or 4 classification under the provisions of subsection (c)(3) of this section must also monitor

and record the amount of water treated by each UV unit each month and the amount of water produced each month when the unit was not operating within validated conditions.

(4) Analytical requirements. All monitoring required by this subsection must be conducted at a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures).

(A) The pH analysis must be conducted using a pH meter with a minimum accuracy of plus or minus 0.1 pH units.

(B) The temperature of the water must be measured using a thermometer or thermocouple with a minimum accuracy of plus or minus 0.5 degrees Celsius.

(C) The free chlorine or chloramine residual (measured as total chlorine) must be measured to a minimum accuracy of plus or minus 0.1 milligrams per liter (mg/L). Color comparators may be used for distribution system samples only. When used, a color comparator must have current reagents, an unfaded and clear color comparator, a sample cell that is not discolored or stained, and must be properly stored in a cool, dark location where it is not subjected to conditions that would result in staining. The color comparator must be used in the correct range. If a sample reads at the top of the range, the sample must be diluted with chlorine-free water, then a reading taken and the resulting residual calculated.

(D) The chlorine dioxide residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using a method that conforms to the requirements of §290.119 of this title. The DPD-glycine method using a colorimeter or spectrophotometer may be utilized only with the written permission of the executive director. [one of the following methods:]

[(i) Amperometric titrator with platinum-platinum electrodes; or]

[(ii) Lissamine Green B.]

(E) The ozone residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using the Indigo Method and using a colorimeter or spectrophotometer.

(F) The UV dose must be measured by a calibrated sensor approved by the executive director.

(e) Filtration requirements for conventional filters. A system that uses granular media filters to treat surface water or groundwater under the direct influence of surface water must meet minimum filtration requirements before the water is supplied to any consumer.

(1) Treatment technique requirements for combined filter effluent. Treatment plants using conventional media filtration must meet the following turbidity requirements.

(A) The turbidity level of the combined filter effluent must never exceed 1.0 nephelometric turbidity unit (NTU).

(B) The turbidity level of the combined filter effluent must be 0.3 NTU or less in at least 95% of the samples tested each month.

(2) Performance criteria for individual filter effluent. The filtration techniques must ensure the public water system meets the following performance criteria.

(A) The turbidity from each individual filter effluent should never exceed 1.0 NTU.

(B) At a public water system that serves 10,000 people or more, the turbidity from each individual filter effluent should not exceed 0.5 NTU at four hours after the individual filter is returned to service after backwash or shutdown.

(3) Routine turbidity monitoring requirements. A system must monitor the performance of its filtration facilities.

(A) A system that serves fewer than 500 people and continuously monitors the turbidity level of each individual filter must measure and record the turbidity level of the combined filter effluent at least once each day that the plant is in operation.

(B) A system that serves at least 500 people and continuously monitors the turbidity level of each individual filter must measure and record the turbidity level of the combined filter effluent at least every four hours that the system serves water to the public.

(C) Except as provided in subparagraph (D) of this paragraph, a system must continuously monitor the filtered water turbidity at the effluent of each individual filter and record the turbidity value every 15 minutes.

(D) A system that serves fewer than 10,000 people and monitors combined filter effluent turbidity in lieu of individual filter effluent turbidity under the provisions of §290.42(d)(11)(E)(ii) of this title (relating to Water Treatment) must:

(i) continuously monitor the turbidity of the combined filter effluent and record the turbidity value every 15 minutes; and

(ii) measure and record the turbidity level at the effluent of each filter at least once each day the plant is in operation.

(4) Special investigation requirements. A system which fails to produce water with acceptable turbidity levels <u>or if the level of removal/inactivation of pathogens is inadequate or cannot be determined, the system</u> must investigate the cause of the problem and take appropriate corrective action. The executive director can waive these special monitoring requirements for systems that have a corrective action schedule approved by the executive director.

(A) A public water system that fails to meet the turbidity criteria specified in paragraph (2) of this subsection must conduct additional monitoring.

(i) Each time a filter exceeds an applicable filtered water turbidity level specified in paragraph (2) of this subsection for two consecutive 15-minute readings, the public water system must either identify the cause of the exceedance or produce a filter profile on the filter within seven days of the exceedance.

(ii) Each time a filter exceeds the filtered turbidity level specified in paragraph (2)(A) of this subsection for two consecutive 15-minute readings on three separate occasions during any consecutive three-month period, the public water

system must conduct a filter assessment on the filter within 14 days of the third exceedance.

(iii) Each time the filtered water turbidity level for a specific filter or any combination of individual filters exceeds 2.0 NTU on two consecutive 15-minute readings during two consecutive months, the public water system must participate in a third-party comprehensive performance evaluation (CPE). If the system serves at least 10,000 people, the CPE must be conducted within 90 days of the first exceedance in the second month. If the system serves fewer than 10,000 people, the CPE must be conducted within 120 days of the first exceedance in the second month.

(iv) A public water system that uses conventional filters may be required to participate in a special investigation conducted by the executive director if, during two consecutive months, the public water system fails to report individual filter effluent turbidity levels on a day when the combined filter effluent turbidity level exceeds 1.0 NTU.

(B) A system that serves fewer than 10,000 people, monitors combined filter effluent turbidity in lieu of individual filter effluent turbidity, and fails to meet the turbidity criteria in paragraph (1)(A) of this subsection must conduct additional monitoring. The executive director may waive these special monitoring requirements for systems that have a corrective action schedule approved by the executive director.

(i) Each time the combined filter effluent turbidity level exceeds 1.0 NTU for two consecutive 15-minute readings, the public water system must either identify the cause of the exceedance or complete a filter profile on the combined filter effluent within seven days of the exceedance.

(ii) Each time the combined filter effluent turbidity level exceeds 1.0 NTU for two consecutive 15-minute readings on three separate occasions during any consecutive three-month period, the public water system must conduct a filter assessment on each filter within 14 days of the third exceedance.

(iii) Each time the combined filter effluent turbidity level exceeds 2.0 NTU on two consecutive 15-minute readings during two consecutive months, the public water system must participate in a third-party CPE within 120 days of the first exceedance in the second month.

(C) A public water system may be required to participate in a special investigation conducted by the executive director when documentation or lack of documentation from a public water system indicates that the pathogen removal/inactivation levels are inadequate or cannot be determined.

(5) Analytical requirements for turbidity. All monitoring required by this subsection must be conducted by a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title. Equipment used for

compliance measurements must be maintained and calibrated in accordance with §290.46(s) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

(A) Turbidity must be measured with turbidimeters that use a method that conforms with the requirements as described in §290.119 of this title. [one of the following methods:]

[(i) EPA Method 180.1 and Standard Method 2130B;]

[(ii) Great Lakes Instruments Method 2; or]

[(iii) Hach FilterTrak Method 10133.]

(B) A system monitoring the performance of individual filters with on-line turbidimeters and recorders may monitor combined filter effluent turbidity levels by either continuously monitoring turbidity levels with an on-line turbidimeter or measuring the turbidity level in grab samples with a bench-top turbidimeter.

(C) Continuous turbidity monitoring must be conducted using a continuous, on-line turbidimeter and a device that records the turbidity level reading at least once every 15 minutes.

(i) Turbidity data may be recorded electronically by a supervisory control and data acquisition system (SCADA) or on a strip chart. The recorder must be designed so that the operator can accurately determine the turbidity level readings at 15-minute intervals.

(ii) If there is a failure in the continuous turbidity monitoring equipment at a system serving 10,000 people or more, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

(iii) If the continuous turbidity monitoring equipment at a system serving fewer than 10,000 people malfunctions, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than 14 working days following the failure of the equipment.

(D) A system that monitors combined filter effluent turbidity in lieu of individual filter effluent turbidity under §290.42(d)(11)(E)(ii) of this title must monitor the performance of individual filters using a bench-top turbidimeter.

<u>(E) Combined filter effluent and individual filter effluent turbidity monitoring equipment and all associated data recording devices shall read and record turbidity levels to adequately determine compliance with the requirements as described</u>

in this subchapter. The turbidity equipment and all associated recording devices shall read and record levels:

(i) at least 10% higher than the turbidity level needed to determine compliance with the highest applicable regulatory requirement as described in this subchapter;

(ii) at the lowest method detection limit of the approved turbidimeter; and

(iii) at the precision and accuracy necessary to determine compliance with the requirements as described in this subchapter.

(f) Filtration requirements for other filters. A system that uses cartridge filters, membrane filters, or other unconventional filtration systems to treat surface water or groundwater under the direct influence of surface water must meet minimum filtration requirements before the water is supplied to any consumer.

(1) Treatment technique requirements. A system that uses unconventional filtration technologies such as membrane filters or cartridge filters must meet treatment technique requirements prescribed by the executive director.

(A) The filtration facilities must meet combined filter effluent and individual filter effluent turbidity limits established by the executive director.

(B) The filtration facilities must be operated and maintained in accordance with requirements that the executive director determines are needed to demonstrate the amount of *Giardia* and *Cryptosporidium* removal achieved.

(2) Monitoring requirements. A system must monitor the performance of its filtration facilities.

(A) A system that serves fewer than 500 people and continuously monitors the turbidity level of each individual cartridge or membrane unit must measure and record the turbidity level of the combined effluent at least once each day that the plant is in operation.

(B) A system that serves at least 500 people and continuously monitors the turbidity level of each individual cartridge or membrane unit must measure and record the turbidity level of the combined effluent at least every four hours that the system serves water to the public.

(C) A system using membranes must use a method approved by the executive director to continuously monitor the quality of the water produced by each membrane unit and record the monitoring results at least once every five minutes. The

executive director may approve monitoring parameters other than turbidity and decrease the frequency to once every 15 minutes if the approved operating parameters will allow consecutive readings to be obtained between backwash or backflush cycles.

(D) A system using membranes must conduct direct integrity testing on each membrane unit using a procedure approved by the executive director.

(i) Direct integrity tests must be conducted in a manner that will detect a membrane defect of 3 microns or smaller and demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration process by the executive director.

(ii) Direct integrity test method must calculate the log removal value for a 3-micron size particle and establish an upper control limit which assures that the unit is capable of meeting the removal credit approved by the executive director.

(iii) A system that has been assigned a Bin 1 classification under the provisions of subsection (c)(3)(B) of this section must conduct direct integrity tests at least once every seven days. The executive director may reduce the testing requirements for other membrane units.

(iv) A system that has been assigned a Bin 2, 3, or 4 classification under the provisions of subsection (c)(3)(B) of this section must conduct

direct integrity tests at least once each day that the membrane unit is used for filtration. The executive director may approve less frequent testing, based on demonstrated process reliability, the use of multiple barriers effective for *Cryptosporidium* removal or inactivation, or reliable process safeguards.

(v) A system must immediately conduct a direct integrity test on any membrane unit that produces filtered water with turbidity level above 0.15 NTU on two consecutive readings. The executive director must establish alternate site-specific control limits for systems that use other approved technology in lieu of turbidimeters to continuously monitor the performance of membrane units.

(vi) A system must immediately remove any membrane unit that fails a direct integrity test from service until the membrane modules in that unit are inspected and, if necessary, repaired. A membrane unit that has been removed from service may not be returned to service until it has passed a direct integrity test.

(E) A system that uses cartridge filters must continuously monitor the performance of the filtration process in a manner approved by the executive director.

(3) Analytical requirements. All monitoring required by this subsection must be conducted by a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title. Equipment used for compliance

measurements must be maintained and calibrated in accordance with §290.46(s) of this title.

(A) Turbidity of the combined effluent must be measured with turbidimeters that meet the requirements of subsection (e)(5)(A) of this section.

(B) The turbidity of the water produced by each membrane unit must be measured using the Hach FilterTrak Method 10133. The executive director may approve the use of alternative technology to monitor the quality of the water produced by each membrane unit.

(C) A system continuously monitoring the performance of individual cartridges or membrane units may monitor combined effluent turbidity levels by either continuously monitoring turbidity levels with an on-line turbidimeter, or by measuring the turbidity level in grab samples with a bench-top turbidimeter.

(D) Data collected from on-line instruments may be recorded electronically by a SCADA system or on a strip chart recorder. The recorder must be designed so that the operator can accurately determine the value of readings at the monitoring interval approved by the executive director.

(i) If there is a failure in the continuous monitoring equipment at a system serving 10,000 people or more, the system must conduct grab sampling every

four hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

(ii) If there is a failure in the continuous monitoring equipment at a system serving fewer than 10,000 people, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than 14 working days following the failure of the equipment.

(E) A system that uses cartridge filters and does not continuously monitor the turbidity of each filter unit must monitor the performance of individual filters at least once each day using a bench-top turbidimeter.

(F) Combined filter effluent and individual filter effluent turbidity monitoring equipment and all associated data recording devices shall read and record turbidity levels to adequately determine compliance with the requirements as described in this subchapter. The turbidity equipment and all associated recording devices shall read and record levels:

(i) at least 10% higher than the turbidity level needed to determine compliance with the highest applicable regulatory requirement as described in this subchapter;

(ii) at the lowest method detection limit of the approved turbidimeter; and

(iii) at the precision and accuracy necessary to determine compliance with the requirements as described in this subchapter.

(4) Special investigation requirements. A system which fails to produce water with acceptable turbidity levels, or if the level of removal/inactivation of pathogens is inadequate or cannot be determined, the system shall investigate the cause of the problem and take appropriate corrective action. The executive director can waive these special monitoring requirements for systems that have a corrective action schedule approved by the executive director.

(A) A public water system that utilizes membrane filters for pathogen removal may be required to participate in a special investigation conducted by the executive director if, during two consecutive months, the system fails to report all required direct integrity test results for a specific membrane unit.

(B) A public water system that utilizes membrane filters for pathogen removal may be required to participate in a special investigation conducted by the executive director if, during two consecutive months, a specific membrane unit fails at least one direct integrity test and continues to produce water.

(C) A public water system may be required to participate in a special investigation conducted by executive director when documentation or lack of documentation from a public water system indicates that the pathogen removal/inactivation levels are inadequate or cannot be determined.

(g) Other treatment credits for systems in Bins 2 through 4. The executive director may grant additional pathogen removal and inactivation credit to systems that meet enhanced design, operational, maintenance, and reporting requirements.

(1) Individual filter effluent. The executive director may approve an additional 1.0-log removal credit for *Giardia* and *Cryptosporidium* to a treatment plant that uses conventional granular media filters.

(A) The executive director will approve the additional credit for a plant if:

(i) the system continuously monitored the filtered water turbidity at the effluent of each individual filter and recorded the turbidity value every 15 minutes that the filter was sending water to the clearwell;

(ii) the turbidity level at each individual filter effluent is less than or equal to 0.15 NTU in at least 95% of the measurements recorded during the month; and

(iii) no individual filter produced water with turbidity level above 0.3 NTU in two consecutive 15-minute readings.

(B) The executive director may also approve the additional credit for a plant that does not meet the requirements of subparagraph (A) of this paragraph if:

(i) the executive director determines that the failure to meet the requirements of subparagraph (A) of this paragraph could not have been prevented through optimizing plant operations, design, or maintenance; and

(ii) the system has experienced no more than two such failures within the most recent 12 months.

(2) Combined filter effluent. The executive director may approve an additional 0.5-log removal credit for *Cryptosporidium* to a treatment plant that uses conventional granular media filters if:

(A) the system continuously monitored the filtered water turbidity at the effluent of each individual filter and recorded the turbidity value every 15 minutes that the filter was sending water to the clearwell;

(B) the turbidity level at the combined filter effluent is less than or equal to 0.15 NTU in at least 95% of the measurements recorded during the month; and

(C) the plant does not receive additional treatment credit under paragraph (1) of this subsection.

(3) Second stage filtration. The executive director will approve an additional 0.5-log removal credit for *Giardia* and *Cryptosporidium* to a treatment plant that uses a second, separate stage of conventional granular media filters if:

(A) the filters in both stages meet minimum design criteria approved by the executive director;

(B) all of the water produced by the plant passes through both stages of filtration;

(C) the system continuously monitored the filtered water turbidity at the effluent of each individual filter in the first stage of filtration and recorded the turbidity value every 15 minutes that the filter was sending water to the clearwell; and

(D) no individual filter in the first stage of filtration produced water with turbidity level above 1.0 NTU in two consecutive 15-minute readings.

(4) Other pathogen control strategies. The executive director may approve an additional removal or inactivation credit for other pre-filtration, filtration, or post-filtration strategies that can demonstrate effective, consistent levels of enhanced pathogen control.

(A) The alternative strategy must achieve a quantifiable reduction in the risk of waterborne disease in all of the treated water produced by the plant.

(B) The alternative strategy must conform to any applicable requirement of 40 CFR §§141.715 - 141.720.

(C) The executive director may establish minimum site-specific design, operational, maintenance, and reporting requirements for any alternative strategy used to meet minimum treatment technique requirements of subsection (c) of this section.

(D) The executive director may not approve additional removal credit under the provisions of this paragraph to any strategy that includes a treatment process has been assigned additional removal or inactivation credit under any other provision of this subsection.

(h) Reporting requirements. Public water systems must properly complete and submit periodic reports to demonstrate compliance with this section.

(1) A system that has a turbidity level exceeding 1.0 NTU in the combined filter effluent must consult with the executive director within 24 hours.

(2) A system that treats surface water sources or groundwater sources under the direct influence of surface water must submit a Surface Water Monthly Operating Report each month for each plant.

(A) A system that uses alternative treatment technologies or has been assigned a Bin 2, Bin 3, or Bin 4 classification under subsection (c)(3)(B) of this section must submit a Surface Water Monthly Operating Report (commission Form 0102D) for alternative technologies.

(B) A system that continuously monitors the performance of individual filters, but is not required to submit commission Form 0102D, must submit a Surface Water Monthly Operating Report (commission Form 0102C).

(C) A system that is allowed by the executive director to submit combined filter effluent turbidity in lieu of individual filter effluent turbidity under §290.42(d)(11)(E)(ii) of this title must submit a Surface Water Monthly Operational Report for Plants That Do Not Have a Turbidimeter on Each Filter (commission Form 0103) each month for each plant that treats surface water or groundwater under the direct influence of surface water.

(3) A system that must complete the additional monitoring required by subsection (e)(4)(A)(i) or (B)(i) of this section must submit a Filter Profile Report for Individual Filters (commission Form 10276) with its Surface Water Monthly Operating Report.

(4) A system that must complete the additional monitoring required by subsection (e)(4)(A)(ii) or (B)(ii) of this section must submit a Filter Assessment Report for Individual Filters (commission Form 10277) with its Surface Water Monthly Operating Report.

(5) A system that must complete the additional monitoring required by subsection (e)(4)(A)(iii) or (B)(iii) of this section must submit a Comprehensive Performance Evaluation Request Form (commission Form 10278) with its Surface Water Monthly Operating Report.

(6) A system must submit any additional reports required by the executive director to verify the level of pathogen removal or inactivation achieved by the system's treatment plants.

(7) A system must submit its *Cryptosporidium* bin classification.

(8) A system must submit reports required by subsection (b)(7) of this section.

(9) Periodic reports required by this section must be submitted to the Water Supply Division, Texas Commission on Environmental Quality, MC 155, P.O. Box 13087, Austin, Texas 78711-3087 by the tenth day of the month following the end of the reporting period.

(i) Compliance determination. Compliance with the requirements of this section must be determined using the criteria of this subsection.

(1) A public water system that fails to complete source water monitoring or conduct the routine monitoring tests and any applicable special investigations required by this section commits a monitoring violation.

(2) A public water system that fails to submit a report required by subsection (h) of this section commits a reporting violation.

(3) <u>A public water system that has one or more of the following conditions as specified in subparagraphs (A) - (E) of this paragraph commits an acute treatment technique violation and is required to issue a public notice and a boil water notice within 24 hours in accordance with §290.122(a) of this title (relating to Public Notification).</u> [A

public water system using conventional filters that has a turbidity level exceeding 5.0 NTU in the combined filter effluent commits an acute treatment technique violation.]

(A) A public water system using conventional filters that has a turbidity level exceeding 5.0 NTU in the combined filter effluent.

(B) A public water system using conventional filters that has a combine filter effluent (CFE) turbidity level exceeding 2.0 NTU at plants that are required to have individual filter effluent (IFE) turbidimeters and failed to properly monitor or record IFE turbidity data during the period when the CFE turbidity level was above 2.0 NTU.

(C) A public water system using conventional filters that has a CFE turbidity level exceeding 2.0 NTU at a plant that has only two filters, is not required to continuously monitor the IFE turbidity level at the effluent of each filter, and did not collect IFE turbidity grab samples during the period when CFE levels were above 2.0 NTU.

(D) A public water system that fails to submit a report required by subsection (h) of this section for two consecutive months.

(E) A public water system using membrane or cartridge filters that has a turbidity level exceeding 1.0 NTU in the combined filter effluent.

(4) A public water system using conventional filters that has one or more of the following conditions as specified in subparagraphs (A) - (D) of this paragraph, and has not met the conditions as specified in paragraph (3) of this subsection, commits an acute treatment technique violation and is required to issue a public notice within 24 hours in accordance with §290.122(a) of this title. [A public water system using membrane filters that has a turbidity level exceeding 1.0 NTU in the combined filter effluent commits an acute treatment technique violation.]

(A) A CFE turbidity level exceeding 1.0 NTU during a period when the disinfection protocol did not achieve an inactivation ratio of at least 2.0 for both *Giardia* and viruses.

(B) A CFE turbidity level exceeding 1.0 NTU during a period that IFE turbidity levels were above 2.0 NTU at one or more filters.

(C) A CFE turbidity level exceeding 1.0 NTU occurring at a plant that is required to have IFE turbidimeters and fails to properly monitor or record IFE turbidity data during the period when the CFE turbidity level was above 1.0 NTU.

(D) A CFE turbidity level exceeding 1.0 NTU occurred at a plant that has only two filters, is not required to continuously monitor the IFE turbidity level at the effluent of each filter, and did not collect IFE turbidity grab samples during the period when CFE levels were above 1.0 NTU.

(5) Except as provided in paragraphs (3) and (4) of this subsection, a public water system that violates the requirements of subsections (c), (d)(1), (e)(1), and (f)(1) of this section commits a nonacute treatment technique violation.

(6) A system that fails to request a bin classification within six months of completing a round of source water monitoring commits a treatment technique violation.

(7) A system that fails to correct the performance-limiting factors identified in a comprehensive performance evaluation conducted under the requirements of subsection (e)(4)(A)(iii) or (B)(iii) of this section commits a violation.

(8) A system that fails to properly issue a public notice required by subsection (j) of this section commits a violation.

(j) Public notification. The owner or operator of a public water system that violates the requirements of this section must notify the executive director and the people served by the system.

(1) A public water system that commits an acute treatment technique violation must notify the executive director and the water system customers of the acute violation within 24 hours in accordance with the requirements of §290.46(q) of this title and §290.122(a) of this title (relating to Public Notification).

(2) A public water system that has a turbidity level exceeding 1.0 NTU in the combined filter effluent must consult with the executive director within 24 hours of the violation.

(A) Based on the results of the consultation, the executive director will determine whether the water system must notify its customers in accordance with the requirements of §290.122(a) or (b) of this title.

(B) A water system that fails to consult with the executive director as required by this paragraph must notify its customers in accordance with the requirements of §290.122(a) of this title.

(3) Except as provided in paragraphs (1) and (2) of this subsection, a public water system that fails to meet the treatment technique requirements of subsections (c), (d)(1), (e)(1), or (f)(1) of this section must notify the executive director by the end of the next business day and the water system customers in accordance with the requirements of §290.122(b) of this title.

(4) A public water system that fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.112. Total Organic Carbon (TOC).

(a) Applicability. A water treatment plant must meet the provisions of this section if the plant:

(1) serves a community or nontransient, noncommunity public water system;

(2) treats surface water or groundwater under the direct influence of surface water; and

(3) uses a series of treatment processes that includes coagulation, flocculation, sedimentation or clarification, and filtration as part of the overall treatment protocol.

(b) Treatment technique. Systems must achieve the Step 1 removal requirements in paragraph (1) of this subsection, meet one of the alternative compliance criteria described in paragraph (2) of this subsection, or apply for the alternative Step 2 removal requirements described in paragraph (3) of this subsection.

(1) Systems must determine their ability to meet the Step 1 removal requirements given in the following table. A water treatment plant's Step 1 total organic carbon (TOC) required percent removal is based upon plant's source water TOC and

alkalinity. Step 1 TOC percent removal requirements are indicated in the following table. Systems practicing softening are evaluated based on the Step 1 TOC removal in the far-right column (Source water alkalinity >120 milligrams per liter (mg/L)) for the specified source water TOC.

Figure: 30 TAC §290.112(b)(1) (No change to the figure as it currently exists in TAC.)

Figure: 30 TAC §290.112(b)(1)

Step 1 TOC Removal Requirements

Source-water TOC (mg/L)	Source-water alkalinity (mg/L as $CaCO_3$) Less than or Equal to...		
	0 - 60	≥60 - 120	≥120
≥ 2.0 - 4.0	35.0% Removal	25.0% Removal	15.0% Removal
≥ 4.0 - 8.0	45.0% Removal	35.0% Removal	25.0% Removal
≥ 8.0	50.0% Removal	40.0% Removal	30.0% Removal

(2) Systems may determine their ability to meet one of the eight alternative compliance criteria listed in this paragraph.

(A) A system meets alternative compliance criteria Number 1 if the system's source water TOC level is less than 2.0 mg/L, calculated quarterly as a running annual average.

(B) A system meets alternative compliance criteria Number 2 if the system's treated water TOC level is less than 2.0 mg/L, calculated quarterly as a running annual average.

(C) A system meets alternative compliance criteria Number 3 if: the system's source water TOC level is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity is greater than 60 mg/L (as calcium carbonate (CaCO3), calculated quarterly as a running annual average; and the total trihalomethanes (TTHM) and haloacetic acid-group of five (HAA5) running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively.

(D) The system meets alternative compliance criteria Number 4 if the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

(E) The system meets alternative compliance criteria Number 5 if the system's source water specific ultraviolet absorbance (SUVA), prior to any treatment,

measured monthly, is less than or equal to 2.0 liters per milligram-meter (L/mg-m), calculated quarterly as a running annual average.

(F) The system meets alternative compliance criteria Number 6 if the system's finished water SUVA, measured monthly at a point prior to any disinfection, is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(G) The system meets alternative compliance criteria Number 7 if the system practices softening, cannot achieve the Step 1 TOC removals required by paragraph (1) of this subsection, and has treated water alkalinity less than 60 mg/L (as CaCO3) and calculated quarterly as a running annual average.

(H) The system meets alternative compliance criteria Number 8 if the system practices softening, cannot achieve the Step 1 TOC removals required by paragraph (1) of this subsection, and has magnesium hardness removal greater than or equal to 10 mg/L (as CaCO3), measured monthly calculated quarterly as a running annual average.

(3) If a system fails to meet the Step 1 TOC removal requirement required by paragraph (1) of this subsection and does not meet one of eight alternative compliance criteria described in paragraph (2) of this subsection, the system must apply to the executive director for approval of Step 2 removal requirements.

(A) The plant must perform Step 2 jar testing to determine the coagulant dose at which the removal of TOC is less than 0.3 mg/L for an increase in coagulant of 10 mg/L alum or its equivalent. This dose is referred to as the point of diminishing returns (PODR).

(B) The system must submit the results of the Step 2 jar testing to the executive director for approval of the alternative removal requirements at least 15 days before the end of the applicable quarter.

(C) The executive director may approve Step 2 alternative removal requirements.

(i) If approved, the removal achieved at the PODR becomes the alternative full-scale TOC removal requirement for the plant.

(ii) The alternate removal requirements may be applied to the quarter in which the jar test results are received and for the following quarter.

(c) TOC monitoring requirements. Systems must conduct required TOC monitoring during normal operating conditions at sites and at the frequency designated in the system's monitoring plan.

(1) Systems must monitor for TOC and alkalinity in the source water prior to any treatment. Between one and eight hours after taking the source water sample, systems must measure each treatment plant TOC after filtration in the combined filter effluent stream. These samples (source water alkalinity, source water TOC, and treated water TOC) are referred to as a TOC sample set.

(2) Systems must take one TOC sample set monthly (every 30 days) at a time representative of normal operating conditions and influent water quality. With the executive director's approval, a system may reduce monitoring according to subparagraphs (A) - (C) of this paragraph.

(A) Systems with a running annual average treated water TOC of less than 2.0 mg/L for two consecutive years may reduce monitoring to one TOC sample set per plant per quarter (every 90 days). The system must revert to routine monitoring in the month following the quarter when the running annual average treated water TOC is greater than or equal to 2.0 mg/L.

(B) Systems with a running annual average treated water TOC of less than 1.0 mg/L for one year may reduce monitoring to one TOC sample set per plant per quarter (every 90 days). The system must revert to routine monitoring in the month following the quarter when the running annual average treated water TOC is greater than or equal to 2.0 mg/L.

(C) Systems with a running annual average source water TOC at each plant of less than or equal to 4.0 mg/L based on the running annual average of the most recent four quarters of monitoring may reduce source TOC monitoring to one source TOC sample per quarter (every 90 days) if they also meet criteria for reduced disinfection byproduct monitoring. In order to remain on quarterly source TOC monitoring, the system must also meet the criteria for reduced trihalomethane and haloacetic acid monitoring given in §290.113(c)(4) of this title (relating to Stage 1 Disinfection Byproducts (TTHM and HAA5)) until the date shown in table §290.113(a)(2) of this title. After the date shown in §290.115(a)(2) of this title (relating to Stage 2 Disinfection Byproducts (TTHM and HAA5)), the system must also meet the criteria for reduced trihalomethane and haloacetic acid monitoring in §290.115(c)(3) of this title in order to remain on quarterly source TOC monitoring. The system must revert to routine monitoring in the first month following the quarter when the running annual average source water TOC is greater than 4.0 mg/L, or the system no longer meets the reduced monitoring criteria for disinfection byproducts.

(3) A public water system attempting to meet the treatment technique requirements for TOC using alternative compliance criteria Number 5 (as defined in subsection (b)(2)(E) of this section) must monitor for SUVA in the source water prior to any treatment at least once each month.

(4) A public water system attempting to meet the treatment technique requirements for TOC using alternative compliance criteria Number 7 (as defined in

subsection (b)(2)(G) of this section) must monitor for alkalinity in the treated water at any point prior to distribution system at least once each month.

(5) A public water system attempting to meet the treatment technique requirements for TOC using alternative compliance criteria Number 8 (as defined in subsection (b)(2)(H) of this section) must monitor for magnesium in both the source water prior to any treatment at and the treated water at any point prior to the distribution system least once each month.

(d) Analytical requirements for TOC treatment. Analytical procedures required by this section must be conducted at a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures).

(e) Reporting requirements for TOC. Systems treating surface water or groundwater under the direct influence of surface water shall properly complete and submit periodic reports to demonstrate compliance with this section.

(1) The reports must be submitted to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087 by the tenth day of the month following the end of the reporting period.

(2) Public water systems must submit a Monthly Operational Report for Total Organic Carbon (commission Form 0879) each month.

(3) A system that does not meet the Step 1 removal requirements must submit a Request for Alternate TOC Requirements at least 15 days before the end of the quarter.

(A) If the system meets alternative compliance criterion Number 3, subsection (b)(2)(C) of this section, the system must report the running annual average TTHM and HAA5 concentrations as determined under the requirements of §290.113 of this title.

(B) If the system meets alternative compliance criterion Number 4, subsection (b)(2)(D) of this section, the system must report the running annual average TTHM and HAA5 concentrations as determined under the requirements of §290.113 or §290.115 of this title, and report all disinfectants used by the system during last 12 months.

(C) If the system meets alternative compliance criterion Number 5, subsection (b)(2)(E) of this section, the system must report the average source water SUVA for each of the preceding 12 months.

(D) If the system meets alternative compliance criterion Number 6, subsection (b)(2)(F) of this section, the system must report the average treated water SUVA for each of the preceding 12 months.

(E) If the system practices softening and meets alternative compliance criterion Number 8, subsection (b)(2)(H) of this section, the system must report the source water and treated water magnesium concentrations and the average percent removal of magnesium obtained during each of the preceding 12 months.

(F) A system that does not meet any of the alternative compliance criteria must apply for the Step 2 alternative removal requirements and must submit the results of Step 2 jar testing.

(f) Compliance determination. Compliance with the requirements of this section shall be based on the following criteria:

(1) A system that fails to conduct the monitoring tests required by this section commits a monitoring violation. Failure to monitor will be treated as a violation for the entire period covered by the annual average.

(2) A system that fails to report the results of monitoring tests required by this section commits a reporting violation. Systems may use only data collected under the provisions of this section to qualify for reduced monitoring.

(3) A system that does not meet any of the alternative compliance criteria and does not achieve the required TOC removal commits a treatment technique violation. Compliance shall be determined quarterly by determining an annual average removal ratio using the following method:

(A) The actual monthly TOC percent removal must be determined for each month. The actual removal for a TOC sample set is equal to (1 - (treated water TOC/source water TOC)) [(1 - treated water TOC/source water TOC)]. The actual monthly percent removal is calculated as the average of all actual removals [by taking average removal] for all TOC sample sets collected in the month, expressed as [and expressing that value as] a percent.

(B) The required monthly Step 1 or Step 2 TOC percent removal must be determined as provided in subsection (b) of this section. The executive director will approve or disapprove Step 2 requirements based on jar or pilot data. Until the executive director approves the Step 2 TOC removal requirements, the system must meet the Step 1 TOC removals contained in subsection (b)(1) of this section.

(C) The monthly removal ratio must be determined. The monthly removal ratio is determined by dividing the actual monthly TOC percent removal for each month by the required monthly Step 1 or approved Step 2 TOC percent removal for the

month. The alternative compliance criteria may be used on a monthly basis as described in clauses (i) - (iv) of this subparagraph.

(i) If the monthly average source or treated water TOC is less than 2.0 mg/L, a monthly removal ratio value of 1.0 may be assigned (in lieu of the value calculated in subparagraph (C) of this paragraph) when calculating compliance under the provisions of this section.

(ii) If the monthly average water source or treated SUVA level is less than 2.0 L/mg-m, a monthly removal ratio value of 1.0 may be assigned (in lieu of the value calculated in subparagraph (C) of this paragraph) when calculating compliance under the provisions of this section.

(iii) In any month that a softening system lowers alkalinity below 60 mg/L (as CaCO3), a monthly removal ratio value of 1.0 may be assigned (in lieu of the value calculated in subparagraph (C) of this paragraph) when calculating compliance under the provisions of this section.

(iv) In any month that a softening system removes at least 10 mg/L of magnesium hardness (as CaCO3) a monthly value of 1.0 may be assigned (in lieu of the value calculated in subparagraph (C) of this paragraph) when calculating compliance under the provisions of this section.

(D) The annual average [yearly] removal ratio must be determined. The annual average [yearly] removal ratio is the [running annual] average of all [the quarterly averages of the] monthly removal ratios over the most recent 12-month period [averages]. To determine the annual average removal ratio, determine the sum of all [this value, for each quarter in the compliance year, determine the] monthly removal ratios in the most recent 12-month period, divide that sum by 12, [ratio, add the removal ratios and divide by three. Then, add the quarterly removal ratio and divide by four].

(E) If the annual average [yearly] removal ratio is less than 1.00, the system commits a treatment technique violation.

(4) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(g) Public Notification. A public water system that violates the treatment technique requirements of this section must notify the executive director and the system's customers.

(1) A public water system that commits a TOC treatment technique violation shall notify the executive director and the water system customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(2) A public water system which fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.113. Stage 1 Disinfection Byproducts (TTHM and HAA5).

(a) Applicability for total trihalomethanes (TTHM) and haloacetic acids (group of five) (HAA5). All community and nontransient, noncommunity water systems shall comply with the requirements of this section.

(1) Systems must comply with the Stage 1 requirements in this section until the date shown in the table entitled "Date to Start Stage 2 Compliance."

(2) Until the date shown in the table in Figure: 30 TAC §290.11(3)(a)(2) of this paragraph [(1) of this subsection], systems must continue to monitor according to this section.

Figure: 30 TAC §290.113(a)(2) (No change to the figure as it currently exists in TAC.)

Date to Start Stage 2 Compliance	
This type of system:	**Must comply with Stage 2 starting:**
Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system:	
System serving 100,000 or more population	April 1, 2012
System serving 50,000 to 99,999 population	October 1, 2012
System serving 10,000 to 49,999 population	October 1, 2013

System serving fewer than 10,000 population if the system distributes only treated groundwater or potable water purchased from another system	October 1, 2013
System serving fewer than 10,000 population that treats surface water (or groundwater under the direct influence of surface water) if no *Cryptosporidium* monitoring is required under §290.111(b)(3)(B) of this title (relating to Surface Water Treatment)	October 1, 2013
System serving fewer than 10,000 population that treats surface water (or groundwater under the direct influence of surface water) if *Cryptosporidium* monitoring is required under §290.111(b)(3)(B) of this title	October 1, 2014
Systems of any population that are part of a combined distribution system:	
Consecutive system or wholesale system that is part of a combined distribution system	At the same time as the system with the earliest compliance date in the combined distribution system

(b) Maximum contaminant level (MCL) for TTHM and HAA5. The running annual average concentration of TTHM and HAA5 shall not exceed the MCLs.

(1) The MCL for TTHM is 0.080 milligrams/liter (mg/L).

(2) The MCL for HAA5 is 0.060 mg/L.

(c) Monitoring requirements for TTHM and HAA5. Systems must take all TTHM and HAA5 samples during normal operating conditions. Monitoring shall be performed at locations and frequency specified in the system's monitoring plan.

(1) The minimum number of samples required to be taken shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer shall be considered as one treatment plant for determining the minimum number of samples.

(2) All samples taken within one sampling period shall be collected within a 24-hour period.

(3) Systems must routinely sample at the frequency and locations given in the following table entitled "Stage 1 Routine Monitoring Frequency and Locations for TTHM and HAA5."

Figure: 30 TAC §290.113(c)(3) (No change to the figure as it currently exists in TAC.)

STAGE 1 ROUTINE MONITORING FREQUENCY AND LOCATIONS FOR TTHM AND HAA5		
Type of System	**Minimum Monitoring Frequency**	**Sample Location in the Distribution System**
Surface water or groundwater under the direct influence of surface water system	four water samples per quarter per	At least 25 % of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average

serving at least 10,000 persons	treatment plant	residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods[1].
Surface water or groundwater under the direct influence of surface water system serving from 500 to 9,999 persons	one water sample per quarter per treatment plant	Locations representing maximum residence time[1].
Surface water or groundwater under the direct influence of surface water system serving fewer than 500 persons	one sample per year per treatment plant during month of warmest water temperature	Locations representing maximum residence time[1]. If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in subsection (c) of this section.
System using only groundwater not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons	one water sample per quarter per treatment plant[2]	Locations representing maximum residence time[1].
System using only groundwater not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons	one sample per year per treatment plant[2] during month of warmest water temperature	Locations representing maximum residence time[1]. If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets criteria in subsection (c) of this section for reduced monitoring.

[1] If a system elects to sample more frequently than the minimum required, at least 25% of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.
[2] With approval of the executive director, multiple wells drawing water from a single aquifer

may be considered one treatment plant for determining the minimum number of samples required.

(4) The executive director may reduce the monitoring frequency for TTHM and HAA5 as indicated in the following table entitled "Stage 1 Reduced Monitoring Frequency and Locations for TTHM and HAA5."

Figure: 30 TAC §290.113(c)(4) (No change to the figure as it currently exists in TAC.)

STAGE 1 REDUCED MONITORING FREQUENCY AND LOCATIONS FOR TTHM AND HAA5		
IF YOU ARE A...	**YOU MAY REDUCE MONITORING IF YOU HAVE MONITORED AT LEAST ONE YEAR AND YOUR...**	**TO THIS LEVEL**
Surface water or groundwater under the direct influence of surface water system serving at least 10,000 persons which has a source water annual average TOC level, before any treatment, less than or equal to 4.0 mg/L[1]	TTHM annual average less than or equal to 0.040 mg/L and HAA5 annual average less than or equal to 0.030mg/L	one sample per treatment plant per quarter at distribution system location reflecting maximum residence time
Surface water or groundwater under the direct influence of surface water system serving from 500 to 9,999 people which has a source water annual average TOC level, before any treatment,	TTHM annual average less than or equal to 0.040 mg/L and HAA5 annual average less than or equal to 0.030mg/L	one sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature.

less than or equal to 4.0 mg/L[1]		
Surface water or groundwater under the direct influence of surface water system serving fewer than 500 people		Any surface water or groundwater under the direct influence of surface water system serving fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.
System using only groundwater not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons	TTHM annual average less than or equal to 0.040 mg/L and HAA5 annual average less than or equal to 0.030mg/L	one sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature
System using only groundwater not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons	TTHM annual average less than or equal to 0.040 mg/L and HAA5 annual average less than or equal to 0.030mg/L for two consecutive years OR TTHM annual average less than or equal to 0.020 mg/L and HAA5 annual average less than or equal to 0.015mg/L for one year	one sample per treatment plant per three year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January 1 following quarter in which system qualifies for reduced monitoring.

[1]TOC sampling must be performed in accordance with §290.112(c)(2)(C) of this title (relating to Total Organic Carbon (TOC))

(A) The executive director may not reduce the routine monitoring requirements for TTHM and HAA5 until a system has completed one year of routine monitoring in accordance with the provisions of paragraph (3) of this subsection.

(B) A system that is on reduced monitoring and collects quarterly samples for TTHM and HAA5 may remain on reduced monitoring as long as the running annual average of quarterly averages for TTHM and HAA5 is no greater than 0.060 mg/L and 0.045 mg/L, respectively, and as long as it meets the requirements in subparagraph (D) of this paragraph.

(C) A system that is on a reduced monitoring and monitors no more frequently than once each year may remain on reduced monitoring as long as TTHM and HAA5 concentrations are no greater than 0.060 mg/L and 0.045 mg/L, respectively, and as long as it meets the requirements in subparagraph (D) of this paragraph.

(D) To remain on reduced TTHM and HAA5 monitoring, systems that treat surface water or groundwater under the direct influence of surface water must also maintain a source water annual average total organic carbon (TOC) level, before any treatment, less than or equal to 4.0 mg/L (based on the most recent four quarters of monitoring) on a continuing basis at each plant.

(5) The executive director may require a system to return to the routine monitoring frequency described in paragraph (3) of this subsection.

(A) A system that does not meet the requirements of paragraph (4)(B), (C) or (D) of this subsection must return to routine monitoring in the quarter immediately following the quarter in which the results exceed 0.060 mg/L or 0.045 mg/L for TTHMs

and HAA5, respectively, or when the source water annual average TOC level, before any treatment, exceeds 4.0 mg/L at any plant.

(B) A system that is on reduced monitoring and makes any significant change to its source of water or treatment program shall return to routine monitoring in the quarter immediately following the quarter when the change was made.

(C) If a system is returned to routine monitoring, routine monitoring shall continue for at least one year before a reduction in monitoring frequency may be considered.

(D) The executive director may return a system on reduced monitoring to routine monitoring at any time.

(6) Systems monitoring no more frequently than once each year must increase their monitoring frequency to quarterly if either the TTHM annual average is >0.080 mg/L or the HAA5 annual average is >0.060 mg/L. The system must begin monitoring quarterly immediately following the monitoring period in which the system exceeds 0.080 mg/L or 0.060 mg/L for TTHMs or HAA5, respectively.

(d) Analytical requirements for TTHM and HAA5. Analytical procedures required by this section shall be performed in accordance with §290.119 of this title (relating to

Analytical Procedures). Testing for TTHM and HAA5 shall be performed at a laboratory accredited by the executive director.

(e) Reporting requirements for TTHM and HAA5. The [Upon the request of the executive director, the] owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within the first ten days following the month in which the result is received by the public water system, or the first ten days following the end of the required monitoring period as provided by this subsection, whichever occurs first [of the request or within ten days of their receipt by the public water system, whichever is later]. The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(f) Compliance determination for TTHM and HAA5. Compliance with the provisions of this section shall be determined as follows.

(1) A system that fails to monitor in accordance with this section commits a monitoring violation. Failure to monitor will be treated as a violation for the entire period covered by the annual average.

(2) A public water system that fails to report the results of the monitoring tests required by subsection (e) of this section commits a reporting violation.

(3) Compliance with the MCLs for TTHM and HAA5 shall be based on the running annual average of all samples collected during the preceding 12 months.

(A) A public water system that samples for TTHM and HAA5 each quarter must calculate the running annual average of the quarterly averages.

(B) A public water system that samples for TTHM and HAA5 no more frequently than once each year must calculate the annual average of all samples collected during the year.

(C) All samples collected at the sampling sites designated in the public water system's monitoring plan shall be used to compute the quarterly and annual averages unless the analytical results are invalidated by the executive director for technical reasons.

(4) A public water system violates the MCL for TTHM if the running annual average for TTHM exceeds the MCL specified in subsection (b)(1) of this section.

(5) A public water system violates the MCL for HAA5 if the running annual average for HAA5 exceeds the MCL specified in subsection (b)(2) of this section.

(6) If a public water system is routinely sampling in accordance with the requirements of subsection (c)(3) of this section and an individual sample or quarterly average will cause the system to exceed the MCL for TTHM or HAA5, the system is in violation of the respective MCL at the end of that quarter.

(7) If a public water system's failure to monitor makes it impossible to determine compliance with the MCL for TTHM or HAA5, the system commits an MCL violation for the entire period covered by the annual average.

(g) Public Notification Requirements for TTHM and HAA5. A public water system that violates the treatment technique requirements of this section must notify the executive director and the system's customers.

(1) A public water system that violates an MCL given in subsection (b)(1) or (2) of this section shall report to the executive director and the water system customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(2) A public water system which fails to conduct the monitoring required by subsection (c) of this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(h) Best available technology for TTHM and HAA5. Best available technology for treatment of violations of MCLs in subsection (b) of this section are listed in 40 Code of Federal Regulations §141.64(b)(1)(ii).

§290.114. Other Disinfection Byproducts (Chlorite and Bromate).

(a) Chlorite. All public water systems that use chlorine dioxide must comply with the requirements of this subsection.

(1) Maximum contaminant level (MCL) for chlorite. The chlorite concentration in the water in the distribution system shall not exceed an MCL of 1.0 milligrams per liter (mg/L).

(2) Monitoring requirements for chlorite. Public water systems shall measure the chlorite concentration at locations and intervals specified in the system's monitoring plan. All samples must be collected during normal operating conditions.

(A) Each plant using chlorine dioxide must monitor the chlorite concentration in the water entering the distribution system at least once each day. The monitoring frequency at the entry point to the distribution system may not be reduced.

(B) Each plant using chlorine dioxide must monitor the chlorite concentration in the water within the distribution system at each of the following three

locations: at a location near the first customer of a plant using chlorine dioxide; at a location representative of the average residence time in the distribution system; and at a location reflecting maximum residence time in the distribution system. The group of three samples must be collected on the same day and is called a "three-sample set."

(i) Each system must collect at least one three-sample set each month.

(ii) If the chlorite concentration entering the distribution system exceeds 1.0 mg/L, the system must collect a three-sample set within 24 hours.

(iii) The frequency of chlorite monitoring in the distribution system may be reduced to one three-sample set per quarter if none of the entry point or distribution system samples tested during the preceding 12 months contained a chlorite concentration above 1.0 mg/L. A system must revert to the monthly monitoring frequency if the chlorite concentration exceeds 1.0 mg/L in any sample.

(3) Analytical requirements for chlorite. Analytical procedures required by this section shall be performed in accordance with the requirements of §290.119 of this title (relating to Analytical Procedures).

(A) The chlorite concentration of the water entering the distribution system must be analyzed at a facility approved by the executive director. The analysis must have a minimum accuracy of 0.05 mg/L. [and use one of the following methods:]

[(i) amperometric titration using a unit with platinum-platinum electrodes; or]

[(ii) ion chromatography.]

(B) The chlorite concentration of the water within the distribution system must be analyzed using ion chromatography at a facility accredited by the executive director.

(4) Reporting requirements for chlorite. Public water systems that are subject to the provisions of this subsection must provide the executive director with the results of any test, measurement, or analysis required by this section.

(A) Systems using chlorine dioxide must submit a Chlorine Dioxide Monthly Operating Report (commission Form 0690) by the tenth day of the month following the end of the reporting period.

(B) Except where a shorter period is specified in this section, a public water system [Upon the request of the executive director, systems] shall provide the

executive director with a copy of the results of any chlorite test, measurement, or analysis required by paragraph (2)(B) of this subsection within the first ten days following the end of the required monitoring period or ten days following receipt of the results of such test, measurement, or analysis whichever occurs first.

(C) Reports and analytical results must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(5) Compliance determination for chlorite. Compliance with the requirements of this subsection shall be based on the following criteria.

(A) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation.

(B) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

(C) A public water system commits an MCL violation if the arithmetic average of any three-sample set collected in the distribution system exceeds the MCL for chlorite.

(D) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(6) Public notification requirements for chlorite. A public water system that violates the requirements of this subsection must notify the executive director and the system's customers.

(A) A public water system that violates the MCL for chlorite shall notify the executive director by the end of the next business day and the customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(B) A public water system which fails to conduct the monitoring required by this subsection must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(b) Bromate. Community and nontransient, noncommunity public water systems that use ozone must comply with the requirements of this subsection beginning on January 1, 2002.

(1) MCL for bromate. The concentration of bromate at the entry point to the distribution system shall not exceed an MCL of 0.010 mg/L.

(2) Monitoring requirements for bromate. Each plant using ozone must measure the bromate concentration in the water entering the distribution system at least once each month. The monitoring frequency at the entry point to the distribution system may not be reduced. Samples shall be collected when the ozonation system is operating under normal conditions and at locations and intervals specified in the system's monitoring plan.

(3) Analytical requirements for bromate. Analytical procedures required by this section shall be performed in accordance with §290.119 of this title. Testing for bromate shall be performed at a laboratory certified by the executive director.

(4) Reporting requirements for bromate. The [Upon the request of the executive director, the] owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within the first ten days following the month in which the result is received by the public water system, or the first ten days following the end of the required monitoring period as provided by this subsection, whichever occurs first [of the request or within ten days of their receipt by the public water system, whichever is later]. The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(5) Compliance determination for bromate. Compliance with the requirements of this subsection shall be determined using the following criteria.

(A) A system that fails to monitor in accordance with this section commits a monitoring violation. Failure to monitor will be treated as a violation for the entire period covered by the annual average.

(B) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

(C) A public water system violates the MCL for bromate if, at the end of any quarter, the running annual average of monthly averages, computed quarterly, exceeds the maximum contaminant level specified in paragraph (1) of this subsection.

(D) A public water system that fails to do a required public notice or certify that the public notice has been performed commits a public notice violation.

(E) A public water system that fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(6) Public notification requirements for bromate. A public water system that violates the requirements of this subsection must notify the water system's customers and the executive director.

(A) A public water system that violates the MCL for bromate shall notify the customers in accordance with the requirements of §290.122(b) of this title.

(B) A public water system which fails to conduct the monitoring required by this subsection must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.115. Stage 2 Disinfection Byproducts (TTHM and HAA5).

(a) Applicability for total trihalomethanes (TTHM) and haloacetic acids (group of five) (HAA5). All community and nontransient, noncommunity water systems shall comply with the requirements of this section for TTHM and HAA5.

(1) Systems must comply with the initial monitoring requirements starting on the dates given in subsection (c) of this section.

(2) Systems must comply with all of the additional requirements in this section starting on the date shown in the table entitled "Date to Start Stage 2 Compliance."

Figure: 30 TAC §290.115(a)(2) (No change to the figure as it currently exists in TAC.)

Date to Start Stage 2 Compliance[1]	
This type of system:	**Must comply with Stage 2 starting:**
Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system:	
System serving 100,000 or more population	April 1, 2012
System serving 50,000 to 99,999 population	October 1, 2012
System serving 10,000 to 49,999 population	October 1, 2013
System serving fewer than 10,000 population if the system distributes only treated groundwater or potable water purchased from another system	October 1, 2013
System serving fewer than 10,000 population that treats surface water (or groundwater under the direct influence of surface water) if no *Cryptosporidium* monitoring is required under §290.111(b)(3)(B) of this title (relating to Surface Water Treatment)	October 1, 2013
System serving fewer than 10,000 population that treats surface water (or groundwater under the direct influence of surface water) if *Cryptosporidium* monitoring is required under §290.111(b)(3)(B) of this title	October 1, 2014
Systems of any population that are part of a combined distribution system:	
Consecutive system or wholesale system that is part of a combined distribution system	At the same time as the system with the earliest compliance date in the combined distribution system

[1]The executive director may grant up to an additional 24 months for compliance with maximum contaminant levels (MCLs) and operational evaluation levels if the system requires capital improvements to comply with an MCL in accordance with 40 Code of Federal Regulations §141.620(c).

(A) Systems required to conduct quarterly monitoring, must begin monitoring in the first full calendar quarter that includes the compliance date in the table titled "Date to Start Stage 2 Compliance."

(B) Systems required to conduct routine monitoring less frequently than quarterly must begin monitoring in the calendar month approved by the executive director in their Initial Distribution System Evaluation (IDSE) report or revised monitoring plan identifying Stage 2 sample sites.

(3) Systems must complete their monitoring plan for the additional Stage 2 TTHM and HAA5 requirements according to §290.121 of this title (relating to Monitoring Plans) before the date shown in the table entitled "Date to Start Stage 2 Compliance."

(b) Maximum contaminant levels (MCL) and operational evaluation levels (OELs) for TTHM and HAA5. Systems shall comply with MCLs and OELs.

(1) The locational running annual average (LRAA) concentration of TTHM and HAA5 shall not exceed the MCLs [maximum contaminant levels]. A public water system that exceeds a MCL shall determine compliance as described in subsection (f) of this section.

(A) The MCL for TTHM is 0.080 milligrams/liter (mg/L).

(B) The MCL for HAA5 is 0.060 mg/L.

(2) The OEL at any monitoring location is the sum of the two previous quarters' results plus twice the current quarter's result, divided by 4 to determine an average. A public water system that exceeds an OEL shall perform operation evaluation monitoring and reporting described in subsection (e) of this section.

(A) The OEL for TTHM is 0.080 mg/L.

(B) The OEL for HAA5 is 0.060 mg/L.

(c) Monitoring requirements for TTHM and HAA5. Monitoring shall be performed at locations and frequency specified in the system's monitoring plan as approved by the executive director. The executive director may require changes to a system's sampling locations. The executive director may require sampling at additional sampling locations.

(1) Monitoring locations. Systems must establish Stage 2 compliance monitoring sites throughout the distribution system at locations with the potential for relatively high disinfection byproduct formation. Systems must determine Stage 2 compliance monitoring locations by the dates shown in the table titled "Date to Establish Stage 2 Sites."

Figure: 30 TAC §290.115(c)(1) (No change to the figure as it currently exists in TAC.)

Date to Establish Stage 2 Sites	
This type of system:	**Must establish Stage 2 sites by:**
Systems that are not in a combined distribution system:	
System serving 100,000 or more people	January 1, 2009
System serving 50,000 to 99,999 people	July 1, 2009
System serving 10,000 to 49,999 people	January 1, 2010
System serving fewer than 10,000 people	July 1, 2010
Systems in a combined distribution system	
Consecutive or wholesale system of any population	At the same time as the largest system in the combined distribution system

(A) Systems that perform IDSE sampling in accordance with paragraph (5) of this subsection must use the IDSE and Stage 1 results to set Stage 2 compliance monitoring sites.

(B) Systems that do not perform IDSE sampling must set Stage 2 compliance monitoring sites through consultation with the executive director in accordance with this subparagraph.

(i) Systems required to sample at the same number of sites under Stage 1 and Stage 2, can use the Stage 1 sites for Stage 2 compliance monitoring.

(ii) Systems required to sample at more sites under Stage 2 than Stage 1 must identify Stage 2 sites in addition to the existing Stage 1 sites. Systems

must identify additional sites representing areas of the distribution system with potentially high TTHM or HAA5 levels and provide the rationale for identifying these locations as having high levels of TTHM or HAA5. The required number of compliance monitoring locations must be identified.

(iii) Systems required to sample at fewer sites under Stage 2 than Stage 1 must identify which locations will be used for Stage 2. Stage 2 sites will be selected by alternating selection of Stage 1 locations representing the highest TTHM levels and highest HAA5 levels until the required number of compliance monitoring locations have been identified.

(C) The protocol given in [Title] 40 Code of Federal Regulations ([40] CFR) §141.605(c) - (e) for selecting Stage 2 sample sites is hereby adopted by reference.

(D) To change monitoring locations, a system must replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels. Changes must be approved by the executive director and included in the monitoring plan.

(2) Monitoring frequency and number of sample sites. Routine sampling frequency and number of sample sites are given in the following table, titled "Routine Stage 2 Monitoring Frequency and Number of Sites." Systems must take all routine compliance TTHM and HAA5 samples during normal operating conditions.

Figure: 30 TAC §290.115(c)(2) (No change to the figure as it currently exists in TAC.)

Routine Stage 2 Monitoring Frequency and Number of Sites			
Water Type	**Retail Population**	**Routine Frequency[1]**	**Routine Number of Sites[5]**
Surface Water (or Groundwater Under the Direct Influence of Surface Water)[2]	fewer than 500	annual	1 or 2[3]
	500 to 3,300	quarterly	1 or 2[3]
	3,301 to 9,999	quarterly[4]	2
	10,000 to 49,999	quarterly[4]	4
	50,000 to 249,999	quarterly[4]	8
	250,000 to 999,999	quarterly[4]	12
	1,000,000 to 4,999,999	quarterly[4]	16
	5,000,000 or more	quarterly[4]	20
Groundwater	fewer than 500	annual	1 or 2[3]
	500 to 9,999	annual	2
	10,000 to 99,999	quarterly[4]	4
	100,000 to 499,999	quarterly[4]	6
	500,000 or more	quarterly[4]	8

[1]All systems must monitor during month of highest disinfection byproduct concentrations.

[2]A system that uses any treated surface water or groundwater under the direct influence of surface water shall be considered a surface water system for purposes of this section.

[3]Systems serving fewer than 500 people and surface water systems serving 500 to 3,300 people must identify two sample sites in accordance with 40 Code of Federal Regulations §141.605(b) and may sample at a single site if the highest total trihalomethanes (TTHM) and haloacetic acids (group of five) (HAA5) concentrations occur at the same time and place. If highest TTHM and HAA5 concentrations occur at the same time and location, one dual sample set must be collected at that location. If highest TTHM and HAA5 concentrations occur at different locations, then a single TTHM sample must be collected

at the location with higher historical TTHM, and a single HAA5 sample must be collected at the location with higher historical HAA5.

[4]Systems on quarterly monitoring must take dual sample sets every 90 days.

[5]Monitoring locations must be approved by the executive director.

(3) Reduced monitoring for TTHM and HAA5. Monitoring may be reduced when the LRAA is less than or equal to 0.040 mg/L for TTHM and less than or equal to 0.030 mg/L for HAA5 at all Stage 2 compliance monitoring locations. The Stage 2 reduced sampling frequency and number of sample sites are given in the following table, titled "Reduced Stage 2 Monitoring Frequency and Number of Sites."

Figure: 30 TAC §290.115(c)(3) (No change to the figure as it currently exists in TAC.)

Reduced Stage 2 Monitoring Frequency and Number of Sites			
Source Water Type	Population Size Category	Monitoring Frequency [1]	Distribution System Monitoring Location Total per Monitoring Period
Surface or GUI	less than 500	Annual	Monitoring may not be reduced.
	500 to 3,300	Annual	1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.[2]
	3,301 to 9,999	Annual	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.

	10,000 to 49,999	quarterly	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs
	50,000 to 249,999	quarterly	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs
	250,000 to 999,999	quarterly	6 dual sample sets at the locations with the three highest TTHM and three highest HAA5 LRAAs
	1,000,000 to 4,999,999	quarterly	8 dual sample sets at the locations with the four highest TTHM and four highest HAA5 LRAAs
	5,000,000 or more	quarterly	10 dual sample sets at the locations with the five highest TTHM and five highest HAA5 LRAAs
Ground-water	less than 500	every third year (triennial)	1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter. [2]
	500 to 9,999	Annual	1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.[2]
	10,000 to 99,999	Annual	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement
	100,000 to 499,999	quarterly	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs
	500,000 or more	quarterly	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs

[1]Systems on quarterly monitoring must take dual sample sets every 90 days.

[2]Systems on annual monitoring and surface water systems serving 500 to 3,300 people will use a single site if the highest TTHM and HAA5 concentrations occur at the same time and place. Any such system may be required to take individual TTHM and HAA5 samples (instead of a dual sample set) at sites identified as the highest TTHM and HAA5 sites,

respectively. If separate sites for individual TTHM and HAA5 samples are used, then the TTHM sample must be collected during the quarter with highest historical TTHM levels and the HAA5 sample must be collected during the quarter with the highest historical HAA5 level.

(A) Only data collected under the provisions of §290.113 of this title (relating to Stage 1 Disinfection Byproducts (TTHM and HAA5)) and under this section may be used to qualify for reduced monitoring.

(B) In order to remain on reduced monitoring, a system must meet the applicable conditions of this subparagraph.

(i) Systems with annual or less frequent reduced monitoring qualify to remain on reduced monitoring as long as each TTHM sample is less than or equal to 0.060 mg/L and each HAA5 sample is less than or equal to 0.045 mg/L.

(ii) Systems on quarterly reduced monitoring qualify to remain on reduced monitoring as long as the TTHM LRAA is less than or equal to 0.040 mg/L and the HAA5 LRAA is less than or equal to 0.030 mg/L at each monitoring location.

(iii) To qualify for and remain on reduced monitoring, the source water annual average Total Organic Carbon (TOC) level, before any treatment, must be less than or equal to 4.0 mg/L at each treatment plant treating surface water or

groundwater under the direct influence of surface water, based on monitoring conducted under §290.112(c)(2)(C) of this title (relating to Total Organic Carbon (TOC)).

(C) Systems will be returned to routine monitoring:

(i) if the LRAA at any monitoring location exceeds either 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 based on quarterly monitoring, or

(ii) if the annual (or triennial) sample at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5, or

(iii) if the source water annual average TOC level, before any treatment, exceeds 4.0 mg/L at any treatment plant treating surface water or groundwater under the direct influence of surface water.

(D) The executive director may return a system on reduced monitoring to routine monitoring at any time.

(E) A system that is on reduced Stage 1 monitoring in accordance with §290.113(c)(4) of this title that has monitoring locations for Stage 2 different from those under Stage 1 must initiate routine monitoring in accordance with paragraph (2) of this subsection on the schedule given in subsection (a) of this section.

(F) A system that is on reduced monitoring in accordance with §290.113(c)(4) of this title may remain on reduced monitoring after the dates identified in subsection (a)(2) of this section only if the system:

(i) received a very small system (VSS) IDSE waiver under paragraph (5)(A) of this subsection or received a 40/30 IDSE waiver under paragraph (5)(B) of this subsection, [and]

(ii) meets the reduced monitoring criteria in subparagraph (B) of this paragraph, and

(iii) is approved to use the same monitoring locations under Stage 1 and Stage 2.

(G) The executive director may choose to perform calculations and determine whether the system is eligible for reduced monitoring in lieu of having the system report that information.

(4) Increased monitoring for TTHM and HAA5. The executive director may increase monitoring in accordance with this paragraph.

(A) A system required to routinely monitor at a particular location annually or less frequently than annually under paragraph (2) of this subsection must

increase monitoring to quarterly dual sample sets (every 90 days) at all locations if any TTHM compliance sample is greater than 0.080 mg/L or if any HAA5 compliance sample is greater than 0.060 mg/L at any location.

(B) The executive director may return a system on increased quarterly monitoring to routine monitoring after at least four consecutive quarters if the LRAA for every monitoring location is less than or equal to 0.060 mg/L for TTHM and less than or equal to 0.045 mg/L for HAA5.

(C) A system that is on increased monitoring under §290.113 of this title must remain on increased monitoring until the system qualifies for a return to routine monitoring under subparagraph (B) of this paragraph. The increased monitoring schedule must be conducted at the Stage 2 monitoring locations approved under paragraph (1) of this subsection, beginning on the date identified in subsection (a)(2) of this section.

(5) IDSE [Initial Distribution System Evaluation (IDSE)] requirements. All community systems of any size and nontransient, noncommunity systems that serve at least 10,000 people must comply with these IDSE requirements.

(A) The executive director may grant a VSS IDSE monitoring waiver to systems that serve fewer than 500 people. Systems that receive a VSS IDSE monitoring waiver are not required to do IDSE monitoring. Systems must be compliant with all of the

Stage 1 monitoring requirements of §290.113 of this title to be eligible for a VSS IDSE waiver.

(B) The executive director may grant a 40/30 IDSE monitoring waiver to IDSE monitoring to systems with levels for TTHM less than 0.040 mg/L and levels for HAA5 less than 0.030 mg/L. Systems that receive a 40/30 IDSE monitoring waiver are not required to do IDSE monitoring. Systems must be compliant with all of the Stage 1 monitoring requirements of §290.113 of this title to be eligible for a 40/30 IDSE waiver. The timing of samples that all need to be less than 0.040 mg/L and 0.030 mg/L respectively for TTHM and HAA5 are given in the following table, titled "Timing of Stage 1 Samples Evaluated for 40/30 Initial Distribution System Evaluation (IDSE) Waiver."

Figure: 30 TAC §290.115(c)(5)(B) (No change to the figure as it currently exists in TAC.)

Timing of Stage 1 Samples Evaluated for 40/30 Initial Distribution System Evaluation (IDSE) Waiver	
This type of system:	**40/30 certification is based on eight consecutive calendar quarters of Stage 1 compliance monitoring results beginning no earlier than[1]**
Systems that are not in a combined distribution system:	
System serving 100,000 or more people	January 2004
System serving 50,000 to 99,999 people	
System serving 10,000 to 49,999 people	January 2005

System serving fewer than 10,000 people	
Systems in a combined distribution system	
Consecutive or wholesale system of any population	At the same time as the largest system in the combined distribution system

[1]A system that did not monitor during the specified period must base eligibility on compliance samples taken during the 12 months preceding the specified period.

(i) To qualify for a 40/30 IDSE waiver a system must certify to the executive director that every individual sample taken under §290.113 of this title were less than 0.040 mg/L for TTHM and less than 0.030 mg/L for HAA5, and must have not had any TTHM or HAA5 monitoring violations during the period specified in subsection (a) of this section.

(ii) To qualify for a 40/30 IDSE waiver, a system must submit compliance monitoring results, distribution system schematics, and recommended Stage 2 compliance monitoring locations to the executive director upon request. The executive director may require a system that fails to submit the requested information to perform IDSE sampling.

(iii) The executive director may still require a system that meets the 40/30 IDSE waiver or VSS IDSE waiver requirements to do IDSE sampling under subparagraph (C) of this paragraph.

(C) Systems that must perform IDSE sampling must submit any needed documentation for waivers, produce an IDSE Plan, do IDSE sampling, and report the IDSE results to the executive director on the schedule in the following table titled "Initial Distribution Schedule Evaluation (IDSE) ["IDSE] Schedule."

Figure: 30 TAC §290.115(c)(5)(C) (No change to the figure as it currently exists in TAC.)

Initial Distribution System Evaluation (IDSE) Schedule			
Retail population	**Submit IDSE plan or waiver documentation by:**[1, 2]	**Complete IDSE by:**	**Submit IDSE report by:**[3]
Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system			
100,000 or more	October 1, 2006	September 30, 2008	January 1, 2009
50,000 through 99,999	April 1, 2007	March 31, 2009	July 1, 2009
10,000 through 49,999	October 1, 2007	September 30, 2009	January 1, 2010
less than 10,000 (Community Only)	April 1, 2008	March 31, 2010	July 1, 2010
Other systems that are part of a combined distribution system:			
Any population	At the same time as the system with the earliest compliance date in the combined distribution system		

[1]If, within 12 months after the date identified in this column, the executive director does not approve a system's IDSE plan or notify the system that review is incomplete, the IDSE

plan will be considered approved. The system must implement that plan and must complete standard IDSE monitoring or a system specific study no later than the date identified in the third column.

[2]Waiver documentation must be submitted by the date indicated.
[3]If the executive director does not approve an IDSE report or notify a system that review is incomplete within three months after the IDSE report is due to be submitted, or within nine months of the date that waiver documentation must be submitted for systems receiving waivers, the submitted report or waiver documentation will be considered approved and must be implemented.

(i) The IDSE plan has required elements.

(I) The IDSE plan must include a schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating locations and dates of all projected standard monitoring, and also Stage 1 compliance monitoring under §290.113 of this title.

(II) The IDSE plan must include justification of IDSE monitoring location selection and a summary of data used to justify IDSE monitoring location selection.

(III) The IDSE plan must include the system type and population served by the system.

(ii) Systems must do required IDSE sampling in accordance with this clause.

(I) Systems must monitor at the number and type of sites indicated in the following table titled "Number and Type of Initial Distribution System Evaluation (IDSE) [IDSE] Sample Sites:"

Figure: 30 TAC §290.115(c)(5)(C)(ii)(I) (No change to the figure as it currently exists in TAC.)

Number and Type of Initial Distribution System Evaluation (IDSE) Sample Sites[1]					
Population and water type	**IDSE Site Type**				
	Near Entry Points	**Average Residence Time**	**Potential High TTHM Locations**	**Potential High HAA5 Locations**	**Total Number of Sites**
Systems distributing surface water or groundwater under the direct influence of surface water (GUI)					
less than 500 that purchase treated surface water or GUI	1	-	1	-	2
less than 500 with no purchased water source	-	-	1	1	2
500 to 3,300 that purchase treated surface water or GUI	1	-	1	-	2
500 to 3,300 with no purchased water source	-	-	1	1	2
3,301 to 9,999	-	1	2	1	4

10,000 to 49,999	1	2	3	2	8
50,000 to 249,999	3	4	5	4	16
250,000 to 999,999	4	6	8	6	24
1,000,000 to 4,999,999	6	8	10	8	32
5,000,000 or more	8	10	12	10	40
Systems that only use groundwater not under the direct influence of surface water					
less than 500 that purchase treated groundwater	1	-	1	-	2
less than 500 with no purchased water source nonconsecutive systems	-	-	1	1	2
500 to 9,999	-	-	1	1	2
10,000 to 99,999	1	1	2	2	6
100,000 to 499,999	1	1	3	3	8
500,000 or more	2	2	4	4	12

[1]If the number of entry points to the distribution system is fewer than the specified number of entry point monitoring locations, excess entry point samples must be replaced equally at high TTHM and HAA5 locations. If there is an odd extra location number, the system must take a sample at a high TTHM location. If the number of entry points to the distribution system is more than the specified number of entry point monitoring locations, the system must take samples at entry points to the distribution system having the highest annual water flows.

(II) Systems must collect dual sample sets at each monitoring location. One sample in the dual sample set must be analyzed for TTHM. The other sample in the dual sample set must be analyzed for HAA5.

(III) IDSE sample locations must be different than the existing Stage 1 monitoring locations established under §290.113 of this title.

(IV) IDSE sample locations must be distributed throughout the distribution system.

(V) Systems must monitor at the frequency indicated in the following table titled "Frequency of Initial Distribution System Evaluation (IDSE) [IDSE] Monitoring:"

Figure: 30 TAC §290.115(c)(5)(C)(ii)(V) (No change to the figure as it currently exists in TAC.)

Frequency of Initial Distribution System Evaluation (IDSE) Monitoring[1]	
Population and Type of Water	**Sampling Frequency and Timing[2]**
Systems distributing surface water or groundwater under the direct influence of surface water (GUI)	
less than 500 that purchase treated surface water or GUI	one (during peak historical month[2])

less than 500 with no purchased water source	
500 to 3,300 that purchase treated surface water or GUI	four (every 90 days)
500 to 3,300 with no purchased water source	
3,301 to 9,999	
10,000 to 49,999	six (every 60 days)
50,000 to 249,999	
250,000 to 999,999	
1,000,000 to 4,999,999	
5,000,000 or more	
Systems that only use groundwater not under the direct influence of surface water	
less than 500 that purchase treated groundwater	one (during peak historical month[2])
less than 500 with no purchased water source nonconsecutive systems	
500 to 9,999	four (every 90 days)
10,000 to 99,999	
100,000 to 499,999	
500,000 or more	

[1]A dual sample set with both a total trihalomethanes (TTHM) and an haloacetic acids (group of five (HAA5) sample must be taken at each monitoring location during each monitoring period.

[2]The peak historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature month. Monitoring must be conducted during the peak historical month for TTHM levels or HAA5 levels. Available compliance, study, or operational data must be reviewed to determine the peak historical month for TTHM or HAA5 levels.

(VI) The IDSE monitoring frequency and locations may not be reduced.

(iii) The IDSE report must comply with the elements in this clause.

(I) The IDSE report must include all TTHM and HAA5 analytical results from Stage 1 compliance monitoring under §290.113 of this title and all IDSE sample results and locational running annual averages presented in a tabular or spreadsheet format acceptable as described in Texas Commission on Environmental Quality [TCEQ] regulatory guidance number 384: "How to Develop a Monitoring Plan for a Public Water System."

(II) If changed from the IDSE plan submitted under clause (ii) of this subparagraph, the IDSE report must also include an updated distribution system map, documentation verifying the population served, and an updated list of sources including their water type.

(III) The IDSE report must include an explanation of any deviations from the approved IDSE plan.

(IV) The IDSE report must recommend and justify Stage 2 compliance monitoring locations consistent with paragraph (1) of this subsection. The recommended Stage 2 compliance monitoring locations must be listed in a Stage 2 sample plan as part of the system's monitoring plan.

(V) The IDSE report must include recommendations and justification for when Stage 2 samples should be collected.

(iv) The executive director may approve a system specific study that meets the requirements in 40 CFR §141.602 to comply with IDSE sampling requirements. The commission hereby adopts the requirements of 40 CFR §141.602 by reference.

(D) The executive director may require a system to perform IDSE sampling or a system specific study for any reason. The executive director may require a system to perform IDSE sampling or a system specific study even if the system meets the criteria for an IDSE waiver. The executive director may require new systems and systems with a change in population or system type to perform IDSE sampling or a system specific study.

(d) Analytical requirements for TTHM and HAA5. Analytical procedures required by this section shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for TTHM and HAA5 shall be performed at a laboratory accredited by the executive director.

(e) Reporting requirements for TTHM and HAA5. Public water systems must submit reports related to TTHM and HAA5 to the executive director. Reports must be

mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087.

(1) The [Upon the request of the executive director, the] owner or operator of a public water system must provide the executive director with a copy of the results of any test, measurement, or analysis required by this subsection. The copies must be submitted within the first ten days following the month in which the result is received by the public water system, or the first ten days following the end of the required monitoring period as provided by this subsection, whichever occurs first [of the request or within ten days of their receipt by the public water system, whichever is later].

(A) The owner or operator of a public water system is responsible for reporting the following information for each monitoring location to the executive director within ten days of the end of any quarter in which monitoring is required:

(i) number of samples taken during the last quarter;

(ii) date and results of each sample taken during the last quarter;

(iii) arithmetic average of quarterly results for the last four quarters for each monitoring location (LRAA), beginning at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter;

(iv) whether the MCL was violated at any monitoring location; and

(v) any OELs that were exceeded during the quarter and, if so, the location and date, and the calculated TTHM and HAA5 levels.

(B) If the LRAA based on fewer than four quarters would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, the system must report a potential MCL violation as part of the first report due following the compliance date or anytime thereafter that this determination is made. A system required to conduct monitoring at a frequency that is less than quarterly must make compliance calculations beginning with the first compliance sample taken after the compliance date, unless the system is required to conduct increased monitoring under subsection (c)(4) of this section.

(C) A system that treats surface water or groundwater under the direct influence of surface water that seeks to qualify for or remain on reduced TTHM and HAA5 monitoring must measure and report TOC monthly in accordance with §290.112 of this title and distribution system disinfection levels in accordance with §290.110 of this title (relating to Disinfectant Residuals).

(2) A system that exceeds an OEL described in subsection (b)(2) of this section must conduct an operation evaluation and submit a written operation evaluation report that meets the requirements of this paragraph.

(A) The operation evaluation report must be submitted to the executive director no later than 90 days after being notified of the analytical result that causes the exceedance of the OEL.

(B) The operation evaluation report must document an examination of system treatment and distribution operation practices that may contribute to TTHM and HAA5 formation, including:

(i) storage tank operations;

(ii) excess storage capacity;

(iii) distribution system flushing;

(iv) changes in sources or source water quality;

(v) treatment changes or problems; and

(vi) what steps could be considered to minimize future exceedances.

(C) If the cause of the OEL exceedance is identifiable the scope of the report may be limited with the approval of the executive director. A request to limit the scope of the evaluation does not extend the schedule in subparagraph (A) of this paragraph for submitting the written report. The executive director's approval to limit the scope of the operation evaluation report must be in writing. The system must keep a copy of the executive director's approval with the completed operation evaluation report.

(D) The operation evaluation report must be submitted and approved in writing.

(f) Compliance determination for TTHM and HAA5. Compliance with the provisions of this section shall be determined as follows.

(1) A public water system violates the MCL for TTHM if any locational running annual average for TTHM exceeds an MCL specified in subsection (b)(1)(A) of this section. A public water system violates the MCL for HAA5 if any locational running annual average for HAA5 exceeds the MCL specified in subsection (b)(1)(B) of this section.

(A) Compliance with the MCLs for TTHM and HAA5 shall be based on the LRAA of all samples collected during four consecutive quarters of monitoring. If a

single quarterly sample would cause an LRAA exceedance regardless of the results of subsequent quarters, compliance may be based on fewer than four quarters of data. Should a system fail to collect all required samples, compliance will be based on the available data. All samples collected at the sampling sites designated in the public water system's monitoring plan shall be used to compute the quarterly and annual averages unless the analytical results are invalidated by the executive director for technical reasons.

(B) Stage 2 MCL compliance determination with LRAAs will start after Stage 2 samples are collected.

(i) For systems required to conduct routine quarterly monitoring, compliance calculations will be made starting at the end of the fourth calendar quarter that follows the compliance date in subsection (a)(2) of this section and at the end of each subsequent quarter.

(ii) For systems on quarterly monitoring, where the LRAA based on fewer than four quarters would exceed the MCL regardless of the monitoring results of subsequent quarters, compliance will be calculated beginning with the first sample that causes that exceedance.

(iii) For systems that are required to monitor less frequently than quarterly, compliance shall be calculated beginning with the first compliance sample taken after the compliance date.

(iv) For systems monitoring annually or triennially that start monitoring quarterly in the quarter following an LRAA exceedance, compliance shall be calculated based on the results of all available samples.

(C) If a public water system's failure to monitor makes it impossible to determine compliance with the MCL for TTHM or HAA5, the system commits an MCL violation for the entire period covered by the annual average.

(D) The executive director may choose to perform calculations and determine MCL exceedances in lieu of having the system report that information.

(E) IDSE results will not be used for the purpose of determining compliance with MCLs.

(2) A system that fails to monitor in accordance with this section commits a monitoring violation. A system on a quarterly monitoring schedule is in violation of the monitoring requirements for each quarter that it fails to monitor.

(3) A system that fails to perform a required operation evaluation under subsection (e)(2) of this section commits a monitoring violation.

(4) A public water system that fails to report the results of the monitoring tests required by subsection (e) of this section commits a reporting violation.

(5) A system that fails to submit an operation evaluation report as required under subsection (e)(2) of this section commits a reporting violation.

(6) A system that fails to perform a required public notification commits a public notification violation.

(g) Public notification requirements for TTHM and HAA5. A public water system that violates the treatment technique requirements of this section must notify the executive director and the system's customers.

(1) A public water system that commits an MCL violation described in subsection (f)(1) of this section shall report to the executive director and the water system customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(2) A public water system which fails to conduct the monitoring required by subsection (c) of this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(3) Any IDSE compliance documents required under subsection (c)(5) of this section must be made available to the executive director or the public upon request.

(4) Any operation evaluation report required under subsection (e)(2) of this section must be made available to the executive director or the public upon request.

(h) Best available technology for TTHM and HAA5. Best available technology for treatment of violations of MCLs in subsection (b) of this section are listed in 40 CFR §141.64(b)(2)(ii) and (iii).

§290.116. Groundwater Corrective Actions and Treatment Techniques.

(a) Applicability. All public water systems that use groundwater, except public water systems that combine all of their groundwater with surface water or with groundwater under the direct influence of surface water prior to treatment as described in §290.111 of this title (relating to Surface Water Treatment) [including such systems that use surface water or groundwater under the direct influence of surface water (mixed systems)], must comply with one or more of the treatment techniques and corrective actions of this section if a raw groundwater source sample collected under

§290.109(d)(4)(B), (C), or (E) of this title (relating to Microbial Contaminants) was positive for fecal indicators, or if a significant deficiency was identified, or if the system is not required to conduct raw groundwater source monitoring because it provides at least 4-log treatment of viruses at each groundwater source. At the discretion of the executive director, a public water system not excluded under this subsection, shall comply with the requirements of this section after exceeding a treatment technique trigger as described in accordance with §290.109 of this title. A public water system shall comply with provisions of this section except in cases where the executive director determines that the significant deficiency is in a portion of the distribution system that is served solely by surface water or groundwater under the direct influence of surface water.

(1) A groundwater system must provide written notification to the executive director that it is not required to meet the raw groundwater source monitoring requirements under §290.109(d)(4) [§290.109(c)(4)] of this title [(relating to Microbial Contaminants)] because it provides at least 4-log treatment of viruses for the specified groundwater source and must begin compliance monitoring in accordance with subsection (c) this section. The notification must include engineering, operational, and other information required by the executive director to evaluate the submission. If the executive director determines and documents in writing that 4-log treatment of viruses is no longer necessary for a specified groundwater source or if the system discontinues 4-log treatment of viruses before the first connection for any groundwater source, the system must document this in writing and conduct raw groundwater source sampling as required under §290.109(d)(4) [§290.109(c)(4)] of this title. If the public water system

discontinues 4-log treatment it shall receive prior approval in writing from the executive director that 4-log treatment is no longer necessary for that groundwater source.

(2) A groundwater system that places a groundwater source in service after November 30, 2009, that is not required to meet the raw source monitoring requirements under §290.109(d)(4) [§290.109(c)(4)] of this title because the system provides at least 4-log treatment of viruses for a specified groundwater source must begin compliance monitoring within 30 days of placing the source in service in accordance with subsection (c) of this section. The system must provide written notification to the executive director that it provides at least 4-log treatment of viruses before the first connection for the specified groundwater source. The notification must include engineering, operational, and other information required by the executive director to evaluate the submission. The system must conduct triggered source monitoring under §290.109(d)(4) [§290.109(c)(4)] of this title until the executive director provides written approval of the system's request to provide the 4-log treatment. If the system discontinues 4-log treatment of viruses before the first connection for a groundwater source, the system must conduct raw groundwater source sampling as required under §290.109(d)(4) [§290.109(c)(4)] of this title. If the public water system discontinues 4-log treatment it shall receive prior approval in writing from the executive director that 4-log treatment is no longer necessary for that groundwater source.

(b) Groundwater corrective action plan. All public water systems using groundwater must submit a corrective action plan and implement corrective action if a

raw groundwater source sample was positive for fecal indicators or if a significant deficiency was identified.

(1) If a groundwater source sample was found to be fecal indicator positive or if a significant deficiency was identified, the system must consult with the executive director regarding appropriate corrective action and have an approved corrective action plan in place within 30 days of receiving written notification from a laboratory of the fecal indicator positive source sample collected under §290.109(d)(4) [§290.109(c)(4)] of this title or within 30 days of receiving written notification from the executive director of the identification of a significant deficiency.

(2) Within 120 days of receiving written notification from a laboratory of the fecal indicator positive source sample or receiving written notification from the executive director of a significant deficiency, the system must have completed corrective action or be in compliance with an approved corrective action plan and schedule.

(3) Any changes to the approved corrective action plan or schedule must be approved by the executive director.

(4) The executive director may require interim measures for the protection of public health pending approval of the corrective action plan. The system must comply with these interim measures as well as with any schedules specified by the executive director.

(5) Systems that are required to complete corrective action must implement one or more of the procedures in this paragraph and the details of the implementation must be specified in the approved corrective action plan. <u>If subparagraph (A) or (F) of this paragraph is selected as part of the corrective action plan, then subparagraph (B), (C), (D), or (E) of this paragraph must also be selected.</u>

(A) The system may disinfect the groundwater source where the fecal indicator positive source sample was collected following the American Water Works Association (AWWA) standards for well disinfection and start monthly fecal indicator sampling at that source within 30 days after well disinfection. The executive director may discontinue the monthly source sampling requirement if corrective action is sufficient.

(B) The system may eliminate the groundwater source that was found to be fecal indicator positive and provide an alternate groundwater source if necessary. Eliminated groundwater sources must be disconnected from the distribution system until the contamination is corrected and the executive director approves it for use.

(C) The system may identify and eliminate the source of fecal contamination followed by well disinfection according to AWWA well disinfection standards and begin monthly fecal indicator sampling within 30 days after well disinfection. The executive director may allow the system to discontinue the monthly

source sampling requirement after making a determination that corrective action is sufficient.

(D) The system may provide treatment that reliably achieves at least 4-log treatment of viruses using inactivation, removal or an executive director-approved combination of inactivation and removal before the first connection of the groundwater source.

(E) Correct all significant deficiencies.

(F) Assessment source monitoring for a period of 12 months or a time period specified by the executive director from the raw groundwater source in accordance with §290.109(d)(4)(E) [§290.109(c)(4)(E)] of this title.

(c) Microbial inactivation and removal requirements. A public water system that treats groundwater in response to a fecal indicator positive source sample[,] or significant deficiency, instead of conducting [or in lieu of the] raw groundwater source monitoring, shall meet minimum [disinfection] requirements demonstrating at least 4-log treatment of viruses before the water is distributed to the first connection of the specified groundwater source.

(1) Monitoring requirements for chemical disinfectants. Groundwater systems shall monitor the performance of the disinfection facilities to ensure that

appropriate disinfectant levels are maintained every day the specified source serves the public. All monitoring conducted pursuant to the requirements of this section must be conducted at sites designated in the system's monitoring plan in accordance with §290.121 of this title (relating to Monitoring Plans).

(A) Groundwater systems serving a population greater than 3,300 must continuously monitor the residual disinfectant concentration in accordance with the analytical methods specified in 40 Code of Federal Regulations (CFR) §141.74(a)(2) at a location approved by the executive director and must record the lowest residual disinfectant concentration every day the groundwater source serves the public.

(i) The groundwater system must maintain the executive director-approved minimum specified disinfectant residual every day the groundwater system serves water from the specified groundwater source to the public. If there is a failure in the continuous monitoring equipment, the groundwater system must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service.

(ii) The system must resume continuous residual disinfectant monitoring within 14 days.

(B) Groundwater systems serving a population of 3,300 or fewer must monitor the disinfectant residual in accordance with the analytical methods specified in

40 CFR §141.74(a)(2) in each disinfection zone at least once each day that water from the specified groundwater source is served to the public during either a time when peak hourly raw water flow rates are occurring or at another time specified by the executive director. The system must record and maintain the disinfectant residual every day the system serves water from the groundwater source to the public. The system must collect a daily grab sample during the hour of peak flow or at another time specified by the executive director. If any daily grab sample measurement falls below the executive director-approved minimum specified disinfectant residual, the groundwater system must collect follow-up samples every four hours until the residual disinfectant concentration is restored to the executive director-approved level. Alternatively, a groundwater system that serves 3,300 or fewer people may monitor the residual disinfectant concentration continuously and meet the requirements of subparagraph (A) of this paragraph.

(C) Disinfection contact time will be based on tracer study data or a theoretical analysis submitted by the system owner or their designated agent and approved by the executive director.

(D) Groundwater treatment plants that fail to demonstrate an appropriate level of treatment must repeat these tests at four-hour or shorter intervals until compliance has been reestablished.

(2) Monitoring and operating requirements for commission-approved alternative treatment, including ultraviolet light (UV) disinfection facilities, membrane systems, and other methods that can obtain 4-log inactivation or removal of viruses [and can be properly validated. Public water systems shall monitor the UV intensity as measured by a UV sensor, lamp status, the flow rate through the unit, and other parameters prescribed by the executive director as specified in §290.42(g)(5) of this title (relating to Water Treatment) to ensure that the units are operating within validated conditions].

(A) Public water systems shall monitor the UV intensity as measured by a UV sensor, lamp status, the flow rate through the unit, and other parameters prescribed by the executive director as specified in §290.42(g)(5) of this title (relating to Water Treatment) to ensure that the units are operating within validated conditions.

(B) Public water systems shall monitor and record membrane system performance in accordance with executive director specified requirements.

(3) Analytical requirements. All monitoring required by this section must be conducted at a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures).

(A) The pH analysis must be conducted using a pH meter with a minimum accuracy of plus or minus 0.1 pH units.

(B) The temperature of the water must be measured using a thermometer or thermocouple with a minimum accuracy of plus or minus 0.5 degrees Celsius.

(C) The free chlorine or chloramine residual (measured as total chlorine) must be measured to a minimum accuracy of plus or minus 0.1 milligrams per liter (mg/L). Color comparators may be used for distribution system samples only. When used, a color comparator must have current reagents, an unfaded and clear color comparator, a sample cell that is not discolored or stained, and must be properly stored in a cool, dark location where it is not subjected to conditions that would result in staining. The color comparator must be used in the correct range. If a sample reads at the top of the range, the sample must be diluted with chlorine-free water, then a reading taken and the resulting residual calculated.

(D) The chlorine dioxide residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using one of the following methods:

(i) Amperometric titrator with platinum-platinum electrodes; or

(ii) Lissamine Green B.

(E) The ozone residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using an indigo method that uses a colorimeter or spectrophotometer.

(F) Membrane system integrity monitoring shall be conducted in accordance with executive director specified requirements.

(4) Recordkeeping requirements for microbial inactivation and removal treatment. Groundwater systems, including wholesale, and consecutive [, and mixed] systems, regulated under this subsection must comply with §290.46 of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

(d) Reporting requirements. Groundwater systems conducting 4-log treatment instead of conducting [in lieu of the] raw groundwater source monitoring or required [to conduct] corrective action in response to a fecal indicator positive source sample, or a significant deficiency, must report to the executive director in accordance with this subsection.

(1) A groundwater system required to conduct compliance monitoring for chemical disinfectants must complete a Groundwater Treatment Monthly Operating Report (commission Form 20362) for groundwater disinfection facilities monthly. Groundwater systems must maintain the reports on site and make them available to the executive director upon request.

(2) A groundwater system must provide written notification to the executive director that it is not required to meet the raw groundwater source monitoring requirements under §290.109(d)(4) [§290.109(c)(4)] of this title because it provides at least 4-log treatment of viruses for a specified groundwater source and must begin compliance monitoring in accordance with subsection (c) of this section. The notification must include engineering, operational, and other information required by the executive director to evaluate the submission.

(3) A groundwater system required to complete corrective action under subsection (b) of this section must notify the executive director within 30 days of completing the corrective action.

(4) If a groundwater system is subject to the triggered source monitoring requirements of §290.109(d)(4)(A) [§290.109(c)(4)(A)] of this title and does not conduct source monitoring, the system must provide written documentation that it was providing 4-log treatment of viruses for the specified groundwater source or that it met the criteria set out in §290.109(d)(4)(D) [§290.109(c)(4)(D)] of this title within 30 days of the positive distribution coliform sample.

(5) A groundwater system conducting compliance monitoring under subsection (a) of this section must notify the executive director any time the system fails to meet any executive director-specified requirements (including, but not limited to,

minimum residual disinfectant concentration, and alternative treatment operating criteria) if the operation in accordance with the criteria or requirements is not restored within four hours. The system must notify the executive director as soon as possible, but no later than the end of the next business day.

(6) A groundwater system required to conduct integrity monitoring for membrane systems shall complete the executive director specified reports. The reports shall be maintained in accordance with executive director specified requirements.

(e) Compliance determination. In accordance with this subsection, the executive director shall determine compliance for groundwater systems required to conduct corrective action within 120 days, or pursuant to a groundwater corrective action plan.

(1) A groundwater system is in violation of the treatment technique requirement if it does not complete corrective action in accordance with the executive director-approved corrective action plan or any interim measures required by the executive director.

(2) A groundwater system is in violation of the treatment technique requirement if it is not in compliance with the executive director-approved corrective action plan and schedule.

(3) A groundwater system subject to the requirements of subsection (c) of this section that fails to maintain at least 4-log treatment of viruses is in violation of the treatment technique requirement if the failure is not corrected within four hours. The groundwater system must notify the executive director as soon as possible but no later than the next business day if there is a failure in maintaining the 4-log treatment for more than four hours.

(4) A groundwater system that fails to conduct the disinfectant <u>or membrane system integrity</u> monitoring required under subsection (c) of this section commits a monitoring violation.

(5) A groundwater system that fails to report the results of the disinfectant <u>or membrane system integrity</u> monitoring required under subsection (c) of this section commits a reporting violation.

(6) A groundwater system that fails to issue a required public notice or certify that the public notice has been performed commits a public notice violation.

(f) Public notification. A groundwater system that commits a treatment technique, monitoring, or reporting violation or situation as identified in this section must notify its customers of the violation in accordance with the requirements of §290.122 of this title (relating to Public Notification).

(1) Special notice to the public of significant deficiencies or source water fecal contamination for community systems. In addition to the applicable public notice requirements of §290.122(a) of this title, a community groundwater system that receives notice from the executive director of a significant deficiency or notification of a fecal indicator positive [indicator-positive] groundwater source sample that is not invalidated under §290.109(e)(2) [§290.109(d)(2)] of this title must inform the public served by the water system of the fecal indicator positive [indicator-positive] source sample or of any significant deficiency that has not been corrected in its Consumer Confidence Report as specified in §290.272(g)(7) and (8) of this title (relating to Content of the Report). The system shall continue to inform the public annually until the significant deficiency is corrected or the fecal contamination in the groundwater source is determined by the executive director to be corrected under subsection (b)(2) of this section.

(2) Special notice to the public of significant deficiencies or source water fecal contamination for noncommunity systems. In addition to the applicable public notice requirements of §290.122(a) of this title, a noncommunity groundwater system that receives notice from the executive director of a significant deficiency or notification of a fecal indicator positive [indicator-positive] groundwater source sample that is not invalidated under §290.109(e)(2) [§290.109(d)(2)] of this title must inform the public served by the water system of any significant deficiency that has not been corrected within 12 months of being notified by the executive director, or earlier if directed by the executive director. The system must continue to inform the public annually until the significant deficiency is corrected. The information must include:

(A) posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection; and

(B) any other method reasonably calculated to notify other persons served by the system, if they would not normally be notified by the methods set out in subparagraph (A) of this paragraph. Such persons may include those who may not see a posted notice because the notice is not in a location they routinely frequent. Other methods may include publication in a local newspaper, newsletter, or e-mail; or, delivery of multiple copies in central locations (e.g., community centers).

(C) If directed by the executive director, a noncommunity groundwater system with significant deficiencies that have been corrected must inform its customers of the significant deficiencies, how deficiencies were corrected, and the dates of correction.

§290.117. Regulation of Lead and Copper.

(a) Applicability. The requirements of this section apply to community and nontransient, noncommunity public water systems. These regulations establish requirements for monitoring, reporting, corrosion control studies and treatment, source water treatment, lead service line replacement, and public education. Public water

systems must control the levels of lead and copper in drinking water by controlling the corrosivity of the water. New water systems will be required to meet the requirements of this section when notified by the executive director.

(b) Compliance levels and ranges. Community and nontransient, noncommunity systems must meet designated lead and copper levels and water quality parameter ranges.

(1) Lead and copper action levels. Public water systems must meet action levels for lead and copper in drinking water.

(A) Lead action level. The lead action level is 0.015 milligrams per liter (mg/L). The action level is exceeded if the "90th percentile" lead level exceeds 0.015 mg/L in any monitoring period. The 90th percentile lead level is exceeded when more than 10% of tap water samples have a concentration over the action level.

(B) Copper action level. The copper action level is 1.3 mg/L. The action level is exceeded if the concentration of copper in more than 10% of tap water samples collected during any monitoring period is greater than 1.3 mg/L.

(2) Reduced lead and copper monitoring levels. Systems with levels of lead and copper less than the reduced monitoring levels may be eligible for reduced monitoring under subsections (c) - (e) of this section.

(A) The reduced monitoring level for lead is 0.005 mg/L.

(B) The reduced monitoring level for copper is 0.65 mg/L.

(C) A system with 90th percentile levels of lead and copper less than or equal to the reduced monitoring levels in two consecutive six-month initial or routine tap sampling periods may be eligible for reduced monitoring under subsections (c) - (e) of this section.

(3) Lead and copper Practical Quantitation Levels (PQLs). The PQLs for lead and copper are defined by this paragraph.

(A) The PQL for lead is 0.005 mg/L.

(B) The PQL for copper is 0.050 mg/L.

(4) Optimal water quality parameter (OWQP) ranges. The executive director shall set approved OWQP ranges for systems based on corrosion control studies described in subsection (f)(1) of this section. All systems that exceed an action level for lead or copper based on the 90th percentile are required to have approved OWQP ranges. Systems that serve more than 50,000 people that exceed the PQL for lead based on the 90th percentile are required to have approved OWQP ranges. Systems with approved

water quality parameter ranges shall operate within the approved OWQP ranges at all times.

(A) OWQP ranges shall include all elements contained in this subparagraph.

(i) OWQPs shall include a minimum value or a range of values for negative log of hydrogen ion concentration (pH) measured at each entry point to the distribution system.

(ii) OWQPs shall include a minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0, unless the executive director determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the system to optimize corrosion control.

(iii) If a corrosion inhibitor is used, OWQPs shall include a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the executive director determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system.

(iv) If alkalinity is adjusted as part of optimal corrosion control treatment, OWQPs shall include a minimum concentration or a range of concentrations for alkalinity, measured at each entry point and in all distribution samples.

(v) If calcium carbonate stabilization is used as part of corrosion control, OWQPs shall include a minimum concentration or a range of concentrations for calcium, measured in all distribution samples.

(B) Systems that must perform corrosion controls studies under subsection (f) of this section shall submit proposed system-specific OWQP ranges in writing for the executive director's approval.

(C) The executive director shall review and designate OWQPs in writing within six months after receipt of the system's recommended OWQPs.

(5) Deemed to have optimized corrosion control. A system may be considered deemed to have optimized corrosion control if it meets the requirements of this paragraph.

(A) A system that serves 50,000 or fewer people may be deemed to have optimized corrosion control if the system meets the lead and copper action levels in two consecutive initial or routine monitoring periods.

(B) A system that serves more than 50,000 people may be deemed to have optimized corrosion control if the difference between the 90th percentile lead level and the highest entry point lead level is less than the PQL and the system meets the copper action levels in two consecutive initial or routine monitoring periods.

(C) Those systems whose highest source water lead level is below the method detection limit may also be deemed to have optimized corrosion control under this paragraph if the 90th percentile tap water lead level is less than or equal to the PQL for lead for two consecutive six-month monitoring periods.

(D) Any water system may be deemed by the executive director to have optimized corrosion control treatment if the system demonstrates, to the satisfaction of the executive director, that it has conducted activities equivalent to the corrosion control requirements of this section, including all applicable monitoring requirements.

(E) Any system that fails to perform required monitoring or reporting, operates outside any approved OWQP ranges, or exceeds a lead or copper action level shall no longer be deemed to have optimized corrosion control.

(6) Maximum permissible levels (MPLs) for source water lead. The executive director shall designate MPLs for lead and copper at entry points to the distribution system for systems that are required to install source water treatment under subsection

(g) of this section. Such MPLs shall reflect the contaminant-removal capability of the source water treatment properly operated and maintained. The executive director shall determine MPLs based on source water samples taken by the water system before and after the system installs the approved source water treatment. The executive director will set MPLs in writing, explaining the basis of that decision, within six months after the system completes follow-up tap sampling for lead and copper after source water treatment installation under subsection (g) of this section.

(c) Lead and copper tap sampling locations and frequency. Community and nontransient, noncommunity public water systems shall sample at sites approved by the executive director and at a frequency set by the executive director. Systems shall conduct initial tap sampling until the system either exceeds the lead or copper action level or becomes eligible for reduced monitoring.

(1) Lead and copper tap sampling locations. Systems shall sample at sites approved by the executive director and documented in the system's monitoring plan required under §290.121 of this title (relating to Monitoring Plans).

(A) Number of tap sample sites. The minimum number of sample sites required for initial, routine, or reduced lead and copper tap sampling are listed in the following table, entitled "Required Number of Lead and Copper Tap Sample Sites:"

Figure: 30 TAC §290.117(c)(1)(A) (No change to the figure as it currently exists in TAC.)

Required Number of Lead and Copper Tap Sample Sites		
System Size (Number of People Served)	**Number of Sites for Initial/Routine Monitoring**	**Number of Sites for Reduced Monitoring: annual, three-year, and nine-year**
more than 100,000	100	50
10,001 to 100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
100 or fewer	5	5

(B) Suitable sample taps. All sites from which lead and copper tap samples are collected shall be selected from a pool of targeted sampling sites identified through a materials survey of the distribution system. Sample sites shall be selected first at tier 1, then tier 2, then tier 3 locations as defined in subparagraph (D) of this paragraph. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic chemicals.

(C) Material survey and sample site selection form. Sample sites shall be representative of the distribution system and specifically represent areas of the system most vulnerable to corrosion of lead and copper into the water. The system must maintain a current copy of their Material Survey Form with the monitoring plan.

(i) Material survey. Systems shall perform a materials survey to select sample appropriate tap sampling sites using the Material Survey Form and

Instructions (TCEQ Form Number 20467). The material survey shall be submitted in writing for executive director review and approval. In performing the material survey, the system shall review the sources of information listed in this clause in order to identify sampling sites. In addition, the system shall seek to collect such information where possible in the course of its normal operations (for example, while checking service line materials when reading water meters or performing maintenance activities). Sources of information that must be reviewed include:

(I) all [All] plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system; [and]

(II) all [All] inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; [and]

(III) all [All] existing water quality information, which includes the results of all prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations; [and]

(IV) a [A] water system shall use the information on lead, copper, and galvanized steel that it is required to collect when performing a corrosion control study that is required under subsection (f) of this section.

(ii) Sample site selection form. After completing sample site selection, the system will submit the Lead and Copper Sample Site Selection form (TCEQ Form Number 20467) to the executive director for approval. Systems shall identify routine and reduced monitoring sites on their Lead and Copper Sample Site Selection form.

(I) Selecting tier 1, 2, and 3 sites. Systems shall identify tier 1, tier 2, and tier 3 sites as described in subparagraph (D) of this paragraph.

(II) Sites for community systems with insufficient tier 1, 2, or 3 sites. A community water system with insufficient tier 1, tier 2, and tier 3 sampling sites shall complete its sampling pool with representative sites throughout the distribution system.

(III) Sites for nontransient, noncommunity systems with insufficient tier 1, 2, or 3 sites. A nontransient, noncommunity water system with insufficient tier 1 sites shall complete its sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to

complete the sampling pool, the nontransient, noncommunity water system shall use representative sites throughout the distribution system.

(IV) Sites for systems with lead service lines. Any water system whose distribution system contains lead service lines shall draw 50% of the samples it collects during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50% of the samples from sites served by a lead service line. A water system that cannot identify a sufficient number of sampling sites served by a lead service line shall collect first-draw samples from all of the sites identified as being served by such lines.

(V) Supplemental information with Site Selection Form. Systems shall submit supplemental explanatory information as part of the sample site selection documentation.

(D) Tier 1, 2, and 3 sites. Tier 1, 2, and 3 sites representing potential for leaching lead or copper under corrosive conditions shall be defined as described in this subparagraph.

(i) Definition of community tier 1. The sampling sites selected for a community water system's sampling pool, called "tier l sampling sites," shall consist of single family structures that:

(I) contain [Contain] copper pipes with lead solder installed after 1982 or contain lead pipes; or

(II) are [Are] served by a lead service line. When multiple-family residences comprise at least 20% of the structures served by a water system, the system may include these types of structures in its sampling pool.

(ii) Definition of community tier 2. Any community water system with insufficient tier 1 sampling sites shall complete its sampling pool with "tier 2 sampling sites", consisting of buildings, including multiple-family residences that:

(I) contain [Contain] copper pipes with lead solder installed after 1982 or contain lead pipes; or

(II) are [Are] served by a lead service line.

(iii) Definition of community tier 3. Any community water system with insufficient tier 1 and tier 2 sampling sites shall complete its sampling pool with tier 3 sampling sites consisting of single family structures that contain copper pipes with lead solder installed before 1983.

(iv) Definition of community "other representative sites". A representative site is a site in which the plumbing materials used at that site would commonly be found at other sites served by the water system.

(v) Definition of nontransient, noncommunity tier 1 sites. Tier 1 sampling sites selected for a nontransient, noncommunity water system shall consist of buildings that:

(I) contain [Contain] copper pipes with lead solder installed after 1982 or contain lead pipes; or

(II) are [Are] served by a lead service line.

(vi) Nontransient, noncommunity representative sites. For the purpose of this paragraph, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

(E) Sites for systems missing first-draw sites. A water system may request approval of non-first-draw sample sites if it meets the requirements in this paragraph. The executive director will use all written documentation provided by the system in reviewing the request.

(i) Type of system for non-first-draw sites. In order to request use of non-first-draw sites, the system must be either a nontransient, noncommunity system, or a community system where:

(I) the [The] system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

(II) the [The] system provides water as part of the cost of services provided and does not separately charge for water consumption.

(ii) The request for approval of non-first-draw sites must provide written documentation identifying standing times and locations for enough non-first-draw samples to make up its sampling pool. A system must update their sample sites when system conditions changes, such as changes in population and destruction of previously used sites.

(F) Sites for systems with less than five taps. A public water system that has fewer than five drinking water taps that can be used for human consumption may request a five-tap waiver to collect samples at fewer than five locations. The executive director may allow these public water systems to collect a number of samples less than the number of sites specified in paragraph (1) of this subsection, provided that all taps that can be used for human consumption are sampled. The system must request

this reduction of the minimum number of sample sites in writing based on a request from the system or on-site verification. In no case can the system reduce the number of samples required below the minimum of one sample per available tap.

(G) Use of same taps each round. A water system must collect tap samples from the same sampling sites in each sampling round.

(i) If a water system changes a sampling site for any reason allowed in this section, the water system must provide the executive director with a written explanation showing which sampling site will be abandoned and the sampling site that replaces the abandoned sampling site. The water system's report shall include an explanation as to why a sampling site was changed from the previous round of sampling,

(ii) If a water system cannot collect a sample from a previously used site, the water system shall provide a written explanation to the executive director. The water system must select an alternate sampling site from the system's sampling pool which meets similar criteria and is within reasonable proximity to the original sampling site.

(2) Lead and copper tap sampling frequency. Water systems shall collect at least one sample from the number of sites listed the table in paragraph (1) of this subsection during each monitoring period. Systems shall sample on the schedule determined by the executive director.

(A) Initial and routine tap sampling. New systems, systems that exceed any action level, systems that install corrosion control treatment, systems that exceed a reduced monitoring level, and systems that operate outside an approved OWQP range shall collect tap samples in two consecutive six-month monitoring periods at the initial/routine number of sample sites.

(i) Initial tap sampling. New systems shall collect tap samples in two consecutive six-month monitoring periods at the initial/routine number of sample sites. A new community or nontransient, noncommunity water system begins the first six-month initial monitoring period in the year after it becomes active. Initial tap sampling shall be conducted after the executive director has determined that a system has had sample sites approved based on the materials survey and sample site selection form required by subsection (b)(2) of this section.

(ii) Routine tap sampling. Systems on reduced monitoring may be required to return to routine sampling in two consecutive six-month periods.

(I) Systems that exceed the lead action level during any 4-month monitoring period shall return to routine tap sample monitoring.

(II) Systems required to perform biweekly water quality parameter (WQP) [WQP] sampling that have WQP levels that are outside the system's

approved OWQP range for more than nine days in any six-month period shall return to routine tap sample monitoring.

(III) Systems that are required to return to routine tap sampling because of an action level, reduced monitoring level, or OWQP range exceedance shall start the two consecutive six-month periods in the next calendar year after the exceedance or event that triggers routine monitoring.

(IV) Within 36 months after the executive director designates optimal corrosion control treatment, systems that serve fewer than 50,000 people shall return to routine tap sampling.

(V) Any system that installs corrosion control treatment shall return to routine tap sampling.

(VI) Any system that installs source treatment shall return to routine tap sampling.

(B) Reduced annual tap sampling. Systems that meet the requirements of this paragraph shall collect tap samples every year. Systems on annual reduced monitoring shall collect tap samples at the number of sites in the table entitled "Required Number of Lead and Copper Tap Sample Sites" in paragraph (1) of this subsection. Systems shall collect samples at sites approved by the executive director and

documented in the monitoring plan. Reduced annual monitoring shall be performed during June, July, August, or September. This annual sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period. The executive director shall notify each water system if it is eligible for reduced annual tap sample monitoring.

(i) Systems serving more than 50,000 people that meet the lead action levels, and operate within any approved OWQP ranges, during two consecutive six-month periods may have their sampling frequency reduced to once a year.

(ii) Systems serving 50,000 or fewer people that meet the lead and copper action levels during two consecutive six-month periods may have their sampling frequency reduced to once a year.

(iii) Systems serving 50,000 or fewer people that meet the lead action level, and operate within any approved OWQP ranges, during two consecutive six-month periods may have their sampling frequency reduced to once a year.

(iv) Systems that meet the action levels, but whose 90th percentile levels exceed 0.005 mg/L for lead or 0.65 for copper during two consecutive six-month initial or routine sampling periods must perform two consecutive years of annual monitoring.

(v) Systems monitoring annually, that have been collecting samples during the months of June through September and that receive approval from the executive director to alter their sample collection period under subparagraph (E) of this paragraph must collect their next round of samples during a time period that ends no later than 21 months after the previous round of sampling.

(vi) Systems with approved OWQP ranges that operate outside those ranges are not eligible for reduced annual monitoring.

(C) Reduced three-year tap sampling. Systems which meet the requirements of this paragraph, shall collect tap samples every three years. Systems on reduced three-year monitoring shall collect tap samples at the reduced number of sites in the table entitled "Required Number of Lead and Copper [Lead/Copper] Tap Sample Sites" in paragraph (1) of this subsection. Systems shall collect samples at the sites approved by the executive director and documented in the monitoring plan. Reduced three-year monitoring shall be performed during June, July, August, or September, unless the executive director has designated a different four-month period under subparagraph (E) of this paragraph.

(i) Any system that demonstrates during two consecutive six-month initial or routine monitoring periods that the 90th percentile lead level is less than or equal to 0.005 mg/L and the 90th percentile copper level is less than or equal to 0.65 mg/L shall have the required frequency of sampling reduced to once every three years.

(ii) A system that serves 50,000 or fewer people that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years.

(iii) A system with approved OWQP ranges must operate within those ranges to remain eligible for reduced three-year monitoring.

(iv) Samples collected once every three years shall be collected no later than every third calendar year.

(v) Systems on reduced three-year monitoring that have been collecting samples during the months of June through September, and receive approval from the executive director to alter the sampling collection period as per subparagraph (E) of this paragraph must collect their next round of samples during a time period that ends no later than 45 months after the previous round of sampling.

(D) Reduced nine-year tap sampling. Systems that meet the requirements of the United States Environmental Protection Agency's (EPA's) Lead and Copper Rule Minor Revisions, this paragraph, and serve 3,300 or fewer people shall be eligible for reduced nine-year tap sampling. Systems on reduced monitoring shall collect tap samples at the number of sites in the table entitled "Required Number of Lead and Copper Tap Sample Sites" in paragraph (1) of this subsection. Systems shall collect

samples at the sites approved by the executive director and documented in the monitoring plan. Reduced nine-year tap sampling [monitoring] shall be performed during June, July, August, or September, unless the executive director has designated a different four-month period under subparagraph (E) of this paragraph. The executive director shall notify a system that it is eligible for reduced monitoring.

(i) Initiation of reduced nine-year tap sampling. The first round of reduced nine-year [reduced] tap sampling shall be completed no later than nine years after the last time the system monitored for lead and copper at the tap.

(ii) Materials requirement for reduced nine-year tap sampling. In order to be eligible for reduced nine-year tap sampling [monitoring], a system must provide the executive director with an updated materials survey certifying that the system meets the requirements of this clause.

(I) The water system must demonstrate on the Materials Survey and Lead/Copper Sample Site Selection form (TCEQ Form Number 20467) that its distribution system, service lines, and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the system, are free of lead-containing materials and/or copper-containing materials to demonstrate the risk from lead and/or copper exposure is negligible throughout the water system.

(II) To qualify for reduced nine-year [reduced] tap sampling [monitoring], the water system must certify in writing and provide supporting documentation that the system is free of all lead-containing materials. The system must contain no plastic pipes that contain lead plasticizers, or plastic service lines that contain lead plasticizers. The system must be free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the specifications of any standard established pursuant to 42 United States Code, §300g-6(e) (Safe Drinking Water Act, §1417(e)).

(III) To qualify for reduced nine-year tap sampling [reduced monitoring] the water system must provide certification and supporting documentation to the executive director that the system contains no copper pipes or copper service lines.

(IV) The executive director shall not issue any "partial waivers" for lead and copper monitoring.

(iii) Lead and copper levels for reduced nine-year tap sampling eligibility. To qualify for reduced nine-year tap sampling [reduced monitoring], the public water system must have completed at least one six-month period of initial tap water monitoring. Also, all of the system's 90th percentile lead and copper levels must have been less than or equal to 0.005 mg/L for lead and 0.65 for copper in all sampling performed by the system.

(iv) Conditions for reduced nine-year tap sampling eligibility. As a condition of the reduced nine-year tap sampling schedule [waiver], the executive director may require the system to perform specific activities to avoid the risk of lead or copper concentration of concern in tap water. For example, additional monitoring, periodic outreach to customers to remind them to avoid installation of materials that might void the reduced nine-year tap sampling schedule [waiver], or other activities may be required.

(v) Reduced nine-year [Nine-year] tap sampling revocation. If a water system with a nine-year tap sampling schedule [waiver] adds a new source of water, changes any water treatment, or no longer meets the requirements of this subparagraph, the water system must notify the executive director in writing within 60 days of the change as required by §290.39(j) of this title (relating to General Provisions). The executive director has the authority to [add or] modify the reduced nine-year tap sampling schedule [monitoring waiver conditions] to address changes.

(vi) Notification of change in lead or copper materials. If a system on reduced nine-year tap sampling becomes aware that the system is no longer free of lead-containing or copper-containing materials, the system shall notify the executive director in writing no later than 60 days after becoming aware of such a change. If the system met both the lead and the copper action levels in all previous lead and

copper tap sampling results, the system must return to three-year tap sampling schedule contained in subparagraph (C) of this paragraph.

[(vii) Grandfathered nine-year tap sampling. Systems with nine-year tap sampling waivers approved in writing by the executive director prior to January 1, 2002 shall remain in effect if the system continues to meet the requirements of this paragraph.]

(vii) [(viii)] Tap sampling frequency sequence. Subsequent rounds of sampling, after a return to routine monitoring, must be collected once a year, every three years, or every nine years, as required by this section.

(E) Alternate months for reduced lead and copper tap sampling. The executive director may approve a different period, other than June through September, for systems conducting reduced lead and copper tap sampling. Such a period shall be no longer than four consecutive months and must represent a time of normal operation where the highest levels of lead are most likely to occur. For a nontransient, noncommunity water system that does not operate during the months of June through September, and for which the period of normal operation where the highest levels of lead are most likely to occur is not known, the executive director shall designate a period that represents a time of normal operation for the system. This sampling shall begin during the period designated by the executive director in the calendar year immediately following the end of the second consecutive six-month monitoring period for systems

initiating annual monitoring and during the three-year period following the end of the third consecutive calendar year of annual monitoring for systems initiating three-year reduced monitoring.

(F) Tap sampling monitoring period. For systems on annual or less frequent schedules, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or if the executive director has established an alternate monitoring period, the last day of that period.

(G) Return to initial/routine tap sampling frequency. The executive director shall determine whether a system continues to meet the requirements to remain on reduced annual, three-year, or nine-year monitoring. A system on reduced monitoring may be required to return to routine monitoring as described in subparagraph (A)(i) of this paragraph. Systems required to return to routine monitoring shall sample at the number of routine sites listed in the table entitled "Required Number of Lead and Copper [Lead/Copper] Tap Sample Sites" under paragraph (1) of this subsection.

(H) Replacement tap samples. The water system must collect replacement samples for any samples invalidated under subsection (h) of this section. Any such replacement samples must be collected as soon as possible, but no later than twenty days after receiving notification of sample invalidation approval from the executive director. If a water system discovers that a sample has been collected at an inappropriate sampling site, the water system may request in writing that the sample be

invalidated. The replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those with valid results for the monitoring period.

(I) Nontransient, noncommunity systems with less than five taps. A nontransient, noncommunity system that has fewer than five drinking water taps meeting the sample site criteria of this paragraph must collect at least one sample from each tap and then must collect additional samples from those same taps on different days during the monitoring period to meet the required number of samples unless the system has received a five-tap waiver from the executive director under paragraph (1)(F) of this subsection.

(3) Consumer sampling for lead action level exceeders. Water systems that exceed the lead action level must arrange to sample the tap water of any customer who requests it. Analytical costs may be borne by the consumer.

(d) Lead and copper entry point sampling. Systems must perform entry point lead and copper sampling after the system exceeds a lead or copper action level, installs source water treatment, or exceeds any MPLs set by the executive director. Systems must routinely monitor lead and copper in conjunction with monitoring for inorganic contaminants other than asbestos or nitrate under section §290.106 of this title (relating to Inorganic Contaminants).

(1) Lead and copper entry point sampling locations. Systems required to perform entry point sampling under this subsection shall sample at every entry point to the distribution system including purchased water entry points. The system shall take each subsequent sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. The system must seek executive director approval to modify an entry point sample location, and must revise its monitoring plan.

(2) Lead and copper entry point sampling frequency. If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions when water is representative of all sources being used.

(A) Entry point lead and copper sampling after an action level exceedance. Any system which exceeds the lead or copper action level shall collect one sample from each entry point no later than 180 days after the end of the monitoring period during which the lead or copper action level was exceeded. For systems on annual or less frequent schedules, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or if the executive director has established an alternate monitoring period, the last day of that period.

(B) Entry point lead and copper sampling for systems that meet the action levels. A system is not required to conduct entry point lead and copper sampling if

the system meets the lead and copper action levels during the entire entry point sampling period.

(C) Entry point lead and copper monitoring frequency after installing source water treatment. Any system that installs source water lead or copper removal treatment shall collect entry point samples during two consecutive six-month periods within 36 months after source water treatment begins.

(D) Entry point lead and copper sampling frequency after specification of MPLs. A system shall monitor at the frequency specified below.

(i) Starting the year after the executive director specifies MPLs, water systems using any surface water shall collect annual samples once during each calendar year.

(ii) Starting the year after the executive director specifies MPLs, a water system using only groundwater shall collect samples once during the three-year compliance period in effect at that time. Such systems shall collect samples once during each subsequent compliance period. Triennial samples shall be collected every third calendar year.

(iii) A water system using only groundwater may sample entry points every ninth year if the system meets one of the following criteria.

(I) The entry point lead and copper levels are below the lead and copper MPLs during at least three consecutive compliance periods; or

(II) The executive director has determined that source water treatment is not needed and the system demonstrates that, during at least three consecutive annual or three-year compliance periods, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

(iv) A water system using surface water (or a combination of surface water and ground water) may reduce the lead and copper entry point monitoring frequency to once during every ninth year if the system meets one of the following criteria:

(I) The entry point lead and copper levels are below the MPLs for lead and copper for at least three consecutive years; or

(II) The executive director has determined that source water treatment is not needed and the concentration of lead at all entry points was less than or equal to 0.005 mg/L and the concentration of copper at all entry points was less than or equal to 0.65 mg/L during at least three consecutive years.

(v) A water system that uses a new source of water is not eligible for reduced entry point monitoring for lead and copper until concentrations in samples collected from the new source during three consecutive monitoring periods are below the lead and copper MPLs.

(vi) Where the results of sampling indicate an exceedance of a lead or copper MPL, one additional sample must be collected within two weeks after the initial sample was taken at the same entry point. Samples will be averaged for compliance determination.

(E) All water systems shall notify the executive director in writing of any proposed change in treatment or the addition or deletion of a source of water. The executive director may require any such system to conduct additional monitoring or to take other action to ensure that the system maintains minimal levels of corrosion in the distribution system.

(e) WQP monitoring requirements. Systems shall monitor WQPs to determine the potential for corrosion. [The WQP monitoring requirements are summarized in the table entitled "WQP Entry Point and Distribution Monitoring Summary."] All systems that serve more than 50,000 people shall monitor in accordance with this subsection. Systems that serve 50,000 or fewer people that exceed a lead or copper action level shall monitor in accordance with this <u>subsection</u> [section], during the monitoring period in which the

system exceeds the action level. Sites shall be submitted to the executive director for approval in conjunction with the system's monitoring plan.

(1) WQP monitoring locations. Systems that are required to monitor WQPs shall take two samples at all entry points, distribution, and raw water WQP sites, as specified in paragraph (1)(A) - (C) of this subsection, where applicable, and at the number of distribution sites shown in Figure: 30 TAC §290.117(e)(1). [must sample at all entry points and at the number of distribution sites shown in the table entitled "Number of WQP Distribution Sample Sites." Distribution sample sites must represent the entire distribution system.] Systems on initial or routine monitoring, as described in paragraph (2) of this subsection, must sample at the number of sample sites in the column entitled "Initial and Routine Number of WQP Distribution Sites." Systems on reduced monitoring must sample at the number of sites in the column entitled "Reduced Number of WQP Distribution Sites."

Figure: 30 TAC §290.117(e)(1) (No change to the figure as it currently exists in TAC.)

Number of Water Quality Parameter (WQP) Distribution Sample Sites		
System Size (Number of People Served)	**Initial and Routine Number of WQP Distribution Sites**	**Reduced Number of WQP Distribution Sites**
more than 100,000	25	10
10,001 - 100,000	10	7
3,301 - 10,000	3	3

501 - 3,300	2	2
101 - 500	1	1
less than 101	1	1

(A) Entry point WQP sites. Systems that are required to perform entry point WQP monitoring under this subsection must perform monitoring at every entry point to the distribution system. The executive director may allow systems using only groundwater to forego entry point monitoring, and monitor only at representative distribution system locations according to paragraph (6) of this subsection.

(B) Distribution WQP sites. Sites normally used for bacteriological monitoring or other appropriate sites may be used for WQP sampling. Samples need not be collected inside a customer's home. These sites shall represent water quality throughout the entire distribution system.

(C) Raw water WQP sites. A raw water source sample shall be collected from the raw water line prior to any treatment and at a location approved by the executive director.

(2) Initial and routine WQP monitoring. New systems must perform at least one initial WQP monitoring round in the year following the year that the system is identified as active. Systems that exceed lead or copper action levels shall perform two consecutive six-month periods of routine WQP monitoring. Systems must monitor in

accordance with subparagraph (A) and (B) of this paragraph. [the table entitled "Initial or Routine WQP Entry Point and Distribution Monitoring."]

Figure: 30 TAC §290.117(e)(2)

[Figure: 30 TAC §290.117(e)(2)]

Initial or Routine Entry Point, Distribution, and Raw Water Quality Parameter (WQP) [Entry Point and Distribution] Monitoring			
Monitoring Period	**Initial/Routine WQP List**	**Location**	**Frequency**
Initial or routine monitoring	pH, alkalinity, calcium, conductivity, temperature, total dissolved solids , sodium, sulfate, chloride, hardness, manganese, iron and orthophosphate or silica[1]	Routine number of distribution sites, and all entry point(s), and all raw water WQP sites [Routine number of distribution sites and all entry point(s)]	Quarterly [Every six months]

[1]Orthophosphate (measured as phosphate-phosphorous (PO_4-P)) must be measured only when an inhibitor containing a phosphate compound is used; inhibitors that contain phosphate include orthophosphate and polyphosphate. Silica must be measured only when an inhibitor containing silicate compound is used.

(A) Locations for initial and routine WQP monitoring. Systems must conduct WQP monitoring at the locations specified in paragraph (1)(A) - (C) of this subsection, where applicable, and at the number of distribution sites specified in Figure: 30 TAC §290.117(e)(1). [at all entry points and at the number of distribution sites

specified in paragraph (1) of this subsection, entitled "Number of WQP Distribution Sample Locations."]

(B) Frequency of initial and routine WQP monitoring. Systems serving 50,000 or fewer people shall measure the WQPs listed in this paragraph during each six-month monitoring period in which the system exceeds the lead or copper action level. Systems serving more than 50,000 people must perform two consecutive six-month periods of sampling. Public water systems shall collect WQP samples on a quarterly basis as described in Figure: 30 TAC §290.117(e)(2) to reflect seasonal variability in water quality conditions.

(3) WQP monitoring after installation of corrosion control treatment. Any system that installs optimal corrosion control treatment as required by subsection (f) of this section shall measure the list of WQPs at the locations and frequencies as specified in Figure: 30 TAC §290.117(e)(3). [the table entitled "WQP Entry Point and Distribution Monitoring After Installing Corrosion Control."] Any system serving more than 50,000 people that installs optimal corrosion control treatment shall monitor once during each six-month period. Any system serving 50,000 or fewer people that installs corrosion control treatment shall monitor during each six-month monitoring period specified in which the system exceeds the lead or copper action level.

Figure: 30 TAC §290.117(e)(3)

[Figure: 30 TAC §290.117(e)(3)]

Water Quality Parameter (WQP) Entry Point and Distribution Monitoring After Installing Corrosion Control			
Monitoring Period	**Corrosion Control Installation WQP List**	**Location**	**Frequency**
After installation of corrosion control	pH, alkalinity, calcium, total dissolved solids, temperature, sodium, sulfate, chloride, hardness, manganese, iron and orthophosphate or silica[1] [pH, alkalinity, orthophosphate or silica[1], and calcium[2]]	Routine number of distribution sites	Quarterly
	pH, alkalinity, calcium, total dissolved solids, temperature, sodium, sulfate, chloride, hardness, manganese, iron, alkalinity dosage rate and concentration[2], and inhibitor dosage rate and inhibitor residual[3] [pH, alkalinity dosage rate and concentration[3], and inhibitor dosage rate and inhibitor residual[4]]	All entry points	At least every two weeks.

[1]Orthophosphate must be measured if an inhibitor containing a phosphate compound is used. Silica must be measured if an inhibitor containing silicate compound is used.
[2]Alkalinity [[3]Alkalinity] must be measured if alkalinity is adjusted as part of corrosion control.
[[2]Calcium must be measured if calcium carbonate stabilization is used as part of corrosion control.]
[3]Inhibitor [[4]Inhibitor] dosage rates and inhibitor residual concentrations (orthophosphate or silica) must be measured if an inhibitor is used.

(A) Frequency of WQP monitoring after installation of corrosion control treatment. After a system installs corrosion control treatment, it must collect least one sample every two weeks (biweekly) at every entry point to the distribution system, except as provided under paragraph (6) of this subsection.

(B) Documentation for WQP sample locations after installation of corrosion control treatment. Prior to the starting date of the monitoring period for any

monitoring under this paragraph, the system shall provide the executive director with an updated list of entry points and their sources, a list of distribution sites, and information on seasonal variability of water usage to demonstrate that the sites are representative of water quality and treatment conditions throughout the system. The system shall submit this information to the executive director upon request or when circumstances change and retain a copy of the submittal and approval with the system's monitoring plan.

(C) Additional monitoring when determining optimal corrosion control treatment. The executive director may require the system to conduct additional WQP monitoring in to assist in evaluating the system's sample sites.

(4) WQP monitoring after designation of OWQP ranges. After the executive director approves OWQP ranges, systems shall measure the list of WQPs at the frequency and locations as described in Figure: 30 TAC §290.117(e)(4). [in the table entitled "WQP Entry Point and Distribution Monitoring After OWQP Determination."]

Figure: 30 TAC §290.117(e)(4) (No change to the figure as it currently exists in TAC.)

Water Quality Parameter (WQP) Entry Point and Distribution Monitoring After Optimal Water Quality Parameter (OWQP) Determination			
Monitoring Period	**Post-OWQP Designation WQP List**	**Location**	**Frequency**
After determination of approved OWQP	pH, alkalinity, orthophosphate or silica[1], and calcium[2]	Routine number of distribution sites	Quarterly

ranges by the executive director	pH, alkalinity dosage rate and concentration[3], and inhibitor dosage rate and inhibitor residual[4]	All entry points	At least every two weeks

[1]Orthophosphate must be measured if an inhibitor containing a phosphate compound is used. Silica must be measured if an inhibitor containing silicate compound is used.
[2]Calcium must be measured if calcium carbonate stabilization is used as part of corrosion control.
[3]Alkalinity must be measured if alkalinity is adjusted as part of corrosion control.
[4]Inhibitor dosage rates and inhibitor residual concentrations (orthophosphate or silica) must be measured if an inhibitor is used.

(A) After the executive director approves OWQP ranges, systems serving more than 50,000 people shall measure the WQPs listed in this paragraph and determine compliance with the OWQP ranges quarterly starting with the first six-month period after the executive director specifies the OWQPs beginning on either January 1 or July 1, whichever comes first.

(B) Any system serving 50,000 or fewer people shall conduct WQP monitoring during each six-month period specified in this paragraph in which the system exceeds the lead or copper action level. If the system is eligible for reduced lead and copper tap sampling, the system shall collect WQPs during the same monitoring periods that it collects lead and copper tap samples.

(C) The system shall complete follow-up sampling within 36 months after the executive director designates optimal corrosion control treatment.

(D) Systems shall measure WQPs at every entry point to the distribution system, except as allowed under paragraph (6) of this subsection.

(5) Reduced WQP monitoring. The executive director may reduce monitoring for systems that demonstrate a low risk of corrosion of lead and copper into the drinking water. Water systems on reduced schedules shall monitor the list of WQPs at the locations and frequency given in the table entitled "Reduced Water Quality Parameter (WQP) [WQP] Entry Point and Distribution Monitoring."

Figure: 30 TAC §290.117(e)(5) (No change to the figure as it currently exists in TAC.)

Reduced Water Quality Parameter (WQP) Entry Point and Distribution Monitoring			
Monitoring Period	**Reduced WQP List**	**Location**	**Frequency**
Reduced monitoring	pH, alkalinity, orthophosphate or silica[1], calcium[2]	Reduced number of distribution sites	Quarterly, annually[5], or every 3 years[6]
	pH, alkalinity dosage rate and concentration[3], inhibitor dosage rate and inhibitor residual[4]	All entry point(s)	Every two weeks

[1]Orthophosphate must be measured if an inhibitor containing a phosphate compound is used. Silica must be measured if an inhibitor containing silicate compound is used
[2]Calcium must be measured if calcium carbonate stabilization is used as part of corrosion control.
[3]Alkalinity must be measured if alkalinity is adjusted as part of corrosion control.
[4]Inhibitor dosage rates and inhibitor residual concentrations (orthophosphate or silica) must be measured if an inhibitor is used.
[5]In accordance with subparagraph (B) of this paragraph, the executive director may allow a system to sample WQPs in distribution annually if it has operated within approved Optimal Water Quality Parameters (OWQPs) three consecutive years of monitoring.
[6]In accordance with subparagraph (C) of this paragraph, the executive director may allow systems to sample WQP in distribution once every three years if the system has operated

within approve OWQP ranges during three consecutive years of annual monitoring. The executive director may allow a system to sample WQPs in the distribution once every three years if it has maintained 90th percentile lead levels less than or equal to 0.005 milligrams per liter (mg/L), 90th percentile copper levels less than or equal to 0.65 mg/L, and has operated within approved OWQP ranges during two consecutive six-month monitoring periods.

(A) Reduced quarterly WQP distribution monitoring. A system that operates within approved OWQP ranges in all samples taken during two consecutive six-month initial or routine monitoring periods under paragraph (2) of this subsection may collect tap samples for applicable WQPs from the reduced number of sites quarterly. A water system sampling quarterly shall collect samples evenly throughout the year so as to reflect seasonal variability.

(B) Reduced annual WQP distribution monitoring. Any water system that operates within approved OWQP ranges during three consecutive years of quarterly monitoring may reduce the frequency with which it collects distribution WQP samples to annually. Annual WQP sampling shall begin during the calendar year immediately following the end of the monitoring period in which the third consecutive year of quarterly monitoring occurs. A water system sampling annually shall collect samples evenly throughout the year so as to reflect seasonal variability.

(C) Reduced triennial WQP distribution monitoring. The executive director may reduce the WQP monitoring frequency to once every three years if a system

meets the criteria of this subparagraph. Triennial monitoring shall be done no later than every third calendar year.

(i) A system that operates within approved OWQP ranges during three consecutive years of annual monitoring is eligible to reduce the frequency of distribution WQP monitoring to once in every third year. This sampling shall begin no later than the third calendar year following the end of the monitoring period in which the third consecutive year of monitoring occurs.

(ii) A system that demonstrates during two consecutive six-month periods that the entry point 90th percentile lead level is less than or equal to the PQL for lead in subsection (b)(3) of this section, and that operates within approved OWQP ranges during that time may reduce the frequency of distribution monitoring to once every third year. This sampling shall begin no later than the third calendar year following the end of the year in which the second consecutive six-month period occurs.

(D) Return to routine WQP monitoring. The executive director may return a system to monitoring at the routine frequency and routine number of sample sites. Any water system on reduced monitoring that fails to operate within the approved OWQP range for more than nine days in any six-month monitoring period shall resume routine WQP distribution system sampling in accordance with the number and frequency requirements in paragraph (2) of this subsection. Any system required to return to

routine frequency for lead and copper tap sampling under subsection (c)(2)(A)(ii) of this section shall also return to routine WQP monitoring.

(E) Entry point WQP monitoring. Systems on reduced WQP monitoring shall measure WQPs at every entry point to the distribution system, except as provided under paragraph (6) of this subsection.

(6) Distribution system sampling for systems using only groundwater. The executive director may allow a system using only groundwater to perform WQP sampling required by paragraphs (3), (4), or (5) of this subsection to sample only at representative distribution system sites, and to forego sampling at entry points. Prior to foregoing entry point monitoring, the system shall provide written information identifying the selected entry points and documentation, including information on seasonal variability, sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system to the executive director for approval.

(f) Corrosion control. Systems may be required to perform corrosion control studies to determine whether treatment is necessary to reduce the corrosivity of the water. Systems may be required to install optimal corrosion control treatment in order to control corrosion in the system. The executive director may modify the designated corrosion control treatment or parameters. A system's request for changes and executive director response pursuant to modification shall be in writing.

(1) Corrosion control studies. Systems may be required to perform corrosion control studies to determine whether treatment is necessary to reduce the corrosivity of the water.

(A) Corrosion control studies applicability. Systems that meet the conditions in this subparagraph are required to perform corrosion control studies.

(i) Corrosion control studies for systems serving more than 50,000 people. Systems serving more than 50,000 people are required to conduct corrosion control studies unless the executive director has determined that the system is currently deemed to have optimized corrosion control, as defined in subsection (b)(5) of this section.

(I) Systems serving more than 50,000 people that exceed either the lead or copper action level during any a reduced tap sampling monitoring round must perform a corrosion control study within six months.

(II) Systems serving more than 50,000 people that have not been deemed at any previous time that exceed lead or copper action levels must conduct a demonstration study as described in subparagraph (C) of this paragraph.

(III) The corrosion control study must be conducted and submitted within 12 months after the end of the monitoring period in which the system exceeded the action level.

(ii) Corrosion control studies for systems serving 50,000 or fewer people. Any system serving 50,000 or fewer people that exceeds the lead or copper action level must perform a corrosion control study to identify optimal corrosion control treatment for the system. The system must conduct the study within 12 months after the end of the monitoring period in which the system exceeded the action level.

(B) Scope of corrosion control study. A system required to perform a corrosion control study shall include evaluation of treatment methods and potential constraints to treatment.

(i) Corrosion control treatment methods. Any public water system performing a corrosion control study shall evaluate the effectiveness of each of the following treatments (or combinations of treatments) to identify the optimal control treatment:

(I) alkalinity [Alkalinity] and pH adjustment;

(II) calcium [Calcium] hardness adjustment; and

(III) the [The] addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

(ii) Potential constraints to corrosion control treatment methods. The system shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment. The system shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes. The system shall document treatment considerations with at least one of the following:

(I) data [Data] and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another water system with comparable water quality characteristics, or

(II) data [Data] and documentation demonstrating that the water system has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes.

(C) Demonstration corrosion control study requirements. The water system shall conduct this evaluation using pipe rig/loop tests, metal coupon tests, or

partial systems tests called a demonstration study. The water system shall measure the parameters in this clause in any tests conducted under this subparagraph before and after evaluating the corrosion control treatments listed in subparagraph (B) of this paragraph [above]:

(i) lead [Lead];

(ii) copper [Copper];

(iii) pH;

(iv) alkalinity [Alkalinity];

(v) calcium [Calcium];

(vi) conductivity [Conductivity];

(vii) orthophosphate [Orthophosphate] (when an inhibitor containing a phosphate compound is used);

(viii) silicate [Silicate] (when an inhibitor containing a silicate compound is used); and

(ix) water [Water] temperature.

(D) Desk-top corrosion control study requirements. A desk-top corrosion control study shall recommend treatment and OWQPs based on data for treatments in documented analogous systems called a desk-top study. Analogous system means a system of similar size, water chemistry, and distribution system configuration. The water system shall evaluate each of the corrosion control treatments in subparagraph (B)(i) of this paragraph.

(2) Setting approved OWQP ranges based on corrosion control study data. On the basis of the corrosion control study evaluation, the water system shall recommend to the executive director, in writing, an OWQP range based on normal system operating conditions. Systems must recommend OWQPs consistent with subsection (b)(4) of this section. The executive director will review the study and designate OWQPs. The executive director shall designate OWQP ranges based on the results of lead, copper, and WQP monitoring by the system, both before and after the system installs optimal corrosion control treatment. The executive director may designate values for additional water quality control parameters determined to reflect optimal corrosion control for the system. The executive director shall notify the system in writing of these determinations and will provide the basis for the decision.

(3) Optimal corrosion control treatment designation. A system exceeding the action level for lead or copper based on the 90th percentile level shall submit

recommendations for optimal corrosion control treatment within six months after the end of the monitoring period during which it exceeds one of the action levels. The executive director shall designate the optimal corrosion control treatment method.

(A) On the basis of the corrosion control study in paragraph (1) of this subsection, lead and copper tap sampling, and WQP sampling the water system shall recommend to the executive director, in writing, the treatment option that constitutes optimum corrosion control. The system shall submit all corrosion control data and shall provide sufficient documentation as required by the executive director to establish the validity of the evaluation procedure.

(B) The executive director shall designate optimal corrosion control treatment. The executive director shall either approve the corrosion control treatment option recommended by the system, or designate alternative corrosion control treatment(s) from among those listed in paragraph (1)(B)(i) of this subsection. When designating optimal treatment the executive director shall consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes. If the executive director requests additional information, the water system shall provide the information.

(C) Upon its own initiative or in response to a request by a water system or other interested party, the executive director may modify the determination of the optimal corrosion control treatment. A request for modification by a system or other

interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The executive director may modify the determination when the change is necessary to ensure that the system continues to optimize corrosion control treatment. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the decision, and provide an implementation schedule for completing the treatment modifications.

(D) The executive director shall notify the system of the decision on optimal corrosion control treatment in writing and will provide the basis for this determination. The executive director will review the study and designate optimal corrosion control treatment and water quality parameters.

(i) For systems serving more than 50,000 customers, optimal corrosion control treatment and OWQPs shall be designated within six months of submittal.

(ii) For systems serving 3,300 to 50,000 customers, optimal corrosion control treatment and OWQPs shall be designated within 18 months of submittal.

(iii) For systems serving fewer than 3,300, optimal corrosion control treatment and OWQPs shall be designated within 24 months of submittal.

(4) Installation of optimal corrosion control treatment. A system shall perform corrosion control activities identified in their approved corrosion control study. A system shall install optimal corrosion control treatment within 24 months after the executive director designates optimal corrosion control treatment and notifies the water system. All applicable water systems shall operate optimal corrosion control treatment in a manner that minimizes lead and copper concentrations at users' taps while ensuring that the treatment does not cause the system to violate any other drinking water standard.

(5) Operation of corrosion control treatment. All systems optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including operating within approved OWQP ranges and complying with all other requirements of this section.

(A) The executive director shall evaluate the results of all lead and copper tap samples and WQP samples submitted by the water system to determine whether the corrosion control treatment was properly installed and if the system is properly operating the designated optimal corrosion control treatment.

(B) The system shall operate in such a manner as to meet any requirements that the executive director determines appropriate to ensure optimal corrosion control treatment is maintained.

(6) Small system activities cessation. A system serving 50,000 or fewer people that is required to perform corrosion control activities because of an action level exceedance may cease the corrosion control activities if it conducts two consecutive six-month lead and copper monitoring rounds and meets the lead and copper action levels based on the 90th percentile in both rounds.

(g) Treatment of source water lead and copper. Systems may be required to perform treatment to remove lead or copper from source water. Any system exceeding the lead or copper action level shall implement all applicable source water treatment requirements specified by the executive director under this subsection. The executive director will determine whether such treatment is required.

(1) Determination of need for source water treatment. Any system which exceeds the lead or copper action level shall recommend in writing to the executive director the installation and operation of ion exchange, reverse osmosis, lime softening or coagulation/filtration. The executive director shall evaluate all entry point water sample results, along with the corrosion control study, to determine if source water treatment is necessary. If source water treatment is required by the executive director, the system must install the treatment in accordance with the scheduling requirements specified in this subsection.

(A) The system shall submit the results for all source water samples to aid in the executive director's evaluation of whether source water treatment is necessary.

(B) The executive director may approve the treatment recommended by the system or may require installation and operation of another source water treatment from among the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration.

(C) If the executive director requests additional information to aid in its review, the water system shall provide the information by the date specified by the executive director in the request.

(D) A system may recommend that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.

(E) The executive director shall notify the system in writing of the determination and will provide the basis for the decision.

(2) Schedule for installation of treatment of source water lead and copper. If source water treatment is required, the system must install the treatment in accordance with the scheduling requirements specified in this subsection.

(A) A system exceeding the lead or copper action level shall recommend treatment to the executive director no later than 180 days after the end of the monitoring period during which the lead or copper action level was exceeded.

(B) The executive director shall make a determination regarding source water treatment within six months after the system submits the treatment recommendation and supporting data under subparagraph (A) of this paragraph.

(C) The system shall properly install and operate the source water treatment approved by the executive director within 24 months after the executive director's determination under subparagraph (B) of this paragraph.

(D) The system shall complete follow-up tap sampling under subsection (c) of this section and entry point monitoring under subsection (d) of this section within 36 months after the executive director's determination of source water treatment under subparagraph (B) of this paragraph.

(3) Operation of source water lead and copper treatment. If source water treatment is required, the system shall properly operate the treatment in compliance with the specified MPLs for lead and copper and continue entry point monitoring under subsection (d) of this section.

(A) A water system shall operate the source water treatment in a manner that maintains lead and copper levels below the MPLs designated by the executive director at each entry point.

(B) The executive director may review the system's data and determine whether the system has properly installed and operated the source water treatment.

(4) Modification of source water treatment decisions. Upon its own initiative or in response to a request by a water system or other interested party, the executive director may modify the determination of the source water treatment under paragraph (1) of this subsection, or MPLs for lead and copper at entry points under subsection (b)(6) of this section. A request for modification by a system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The executive director may modify the determination when the change is necessary to ensure that the system continues to minimize lead and copper concentrations in water entering the distribution system. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the executive director's decision, and provide an implementation schedule for completing the treatment modifications.

(h) Analytical methods, sample collection, and sample invalidation. All methods used for analysis under this section shall be consistent with 40 Code of Federal Regulations (CFR) Part 141, Subpart I, concerning Lead and Copper.

(1) Lead and copper tap sample collection method. A first draw tap sample means a one liter or one quart sample of tap water collected from a cold water, frequently used interior tap, after the water has been standing in the plumbing for at least six hours without first flushing the tap. The kitchen cold water faucet is the preferred sampling tap at residential sites. It is recommended that the water not be allowed to stand in the plumbing for more than 18 hours prior to a sample collection. A sample collection may be conducted by either water system personnel or the residents. If the resident is allowed to collect samples for lead and copper monitoring, the water system must provide written instructions for sample collection procedures.

(2) Lead and copper tap sample analytical methods. Analysis for lead and copper shall be conducted using methods stated in 40 CFR §141.89, in laboratories accredited by the executive director. Analysis for pH, conductivity, calcium, alkalinity, orthophosphate, silica, and temperature may be conducted in any laboratory approved by the executive director under §290.121 of this title utilizing the EPA [United States Environmental Protection Agency (EPA)] methods prescribed in 40 CFR §141.89.

(A) The PQLs and the method detection limits [Method Detection Limits] (MDLs) must comply with 40 CFR §141.89. The laboratory accredited for the

analysis of lead and copper tap samples must achieve the MDL of 0.001 mg/L for lead if composited entry point water samples are analyzed for lead.

(B) The executive director may allow the use of previously collected monitoring data if the data were collected in accordance with 40 CFR §141.89.

(C) All lead levels measured between the PQL and MDL must either be reported as measured or reported as one-half the PQL. All levels below the lead MDLs must be reported as zero.

(D) All copper levels measured between the PQL and the MDL must be either reported as measured or reported as one-half the PQL. All levels below the copper MDL must be reported as zero.

(E) First-draw-tap samples must be received in the laboratory within 14 days after the collection date.

(3) Lead and copper tap sample invalidation. The executive director may invalidate a lead or copper tap sample if one of the conditions in subparagraphs (A) - (D) of this paragraph is met:

(A) The laboratory establishes that improper sample analysis caused erroneous results.

(B) The executive director determines that the sample was taken from an inappropriate site.

(C) The sample was damaged in transit.

(D) The executive director determines that the sample was subject to tampering, as based on substantial documentation.

(E) The executive director shall not invalidate a sample based solely on the fact that a follow-up sample result is higher or lower than the original sample. [n]

(F) The water system must provide written documentation to the executive director for samples the water system believes should be invalidated. The executive director must document any decision to invalidate a sample in writing.

(4) Water quality parameter analytical methods. Water quality parameter testing must be conducted at a laboratory that uses the methods described in 40 CFR §141.89, and it is the responsibility of the water system to collect, submit, and report these values.

(A) Analyses for lead, copper, pH, conductivity, calcium, alkalinity, orthophosphate, silica, and temperature shall be conducted in accordance with 40 CFR §141.23(k)(1).

(B) Analyses for alkalinity, calcium, conductivity, orthophosphate and phosphate compounds, pH, silica, and temperature must be performed by a lab approved by the executive director under the Texas Commission on Environmental Quality [TCEQ] Regulatory Guidance 384 "How to Develop a Monitoring Plan for a Public Water System." Analyses under this section for lead and copper shall only be conducted by laboratories that have been accredited by the executive director under [30 TAC] Chapter 25, Subchapter B of this title (relating to Environmental Testing Laboratory Accreditation and Certification).

(C) The executive director may allow the use of previously collected monitoring data for purposes of monitoring, if the data were collected and analyzed in accordance with the requirements of this section and 40 CFR Part 141, Subpart I.

(i) Reporting. Systems shall report any information required by this section and 40 CFR Part 141, Subpart I to the executive director.

(1) Reporting lead and copper tap sample results. Tap sample results shall be reported within ten days following the end of each monitoring period as specified by the executive director. For systems on annual or less frequent schedules, the end of the

monitoring period is September 30 of the calendar year in which the sampling occurs, or if the executive director has established an alternate monitoring period, the last day of that period.

(A) A system shall provide documentation for each tap water lead or copper sample for which the water system requests invalidation.

(B) The system shall provide the following information to the executive director:

(i) the [The] results of all tap samples for lead and copper including the location of each site and the criteria under which the site was selected for the system's sampling pool; and [.]

(ii) an [An] identification of sampling sites utilized during the current monitoring period that were not sampled during previous monitoring periods, and an explanation why sampling sites have changed.

(2) Reporting entry point lead and copper sample results. A water system shall report the sampling results for all source water samples collected in accordance with subsection (e) of this section within the first 10 days following the end of each source water monitoring period.

(3) Reporting WQP results. Systems must report all results of WQP analyses including the location/address of each distribution system sampling point. This report must include each WQP specified in subsection (e) of this section, as well as all sample results from entry points to the distribution system. WQP reports should be submitted to the executive director within the first ten days following the end of each applicable monitoring period. For monitoring periods with a duration less than six months, the end of the monitoring period is the last date samples can be collected during that period.

(A) Systems shall report the results of all distribution samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica.

(B) Systems shall report the results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters.

(C) A system using only groundwater that is allowed to limit WQP monitoring to a subset of entry points shall report, by the commencement of such monitoring, written correspondence to the executive director that identifies the sources flowing to each of the system's entry points and report information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.

(4) Reporting distribution material and sample site data. New systems shall submit the first material survey by December 31 of the year in which they are assigned a Public Water System Identification Number. The executive director may allow a system to submit the first material survey by December 31 of the year in which the system's status becomes active.

(A) All systems shall submit Materials Survey and Site Selection Forms (TCEQ Form Number 20467) describing the entire system before performing tap sampling.

(B) Any system seeking reduced nine-year tap sampling under subsection (c)(2)(D) of this section shall submit current documentation showing that there are no lead- or copper-containing materials within the distribution system.

(i) Prior to starting reduced nine-year tap sampling, a system shall submit documentation showing that there are no lead- or copper- containing materials within the distribution system and that the system complies with all drinking water standards of this subchapter.

(ii) No later than nine years after the first nine-year tap samples are collected, any system desiring to remain on reduced nine-year tap sampling shall provide updated documentation showing that there are no lead- or copper-

containing materials within the distribution system and that the system complies with all drinking water standards of this subchapter.

(iii) No later than 60 days after detecting lead-containing and/or copper-containing material, as appropriate, each system with a reduced nine-year tap sampling schedule [waiver] shall provide written notification to the executive director, setting forth the circumstances resulting in the lead-containing or copper-containing materials being introduced into the system and what corrective action, if any, the system plans to remove these materials.

(C) Water systems requesting a change to previously approved sample sites shall report supporting information, including an explanation as to why a sampling site was changed from the previous round of sampling, if applicable. If a water system changes a sampling site for any reason allowed in this section, the water system must provide the executive director with a written explanation showing which sampling site will be abandoned and the sampling site that replaces the abandoned sampling site.

(5) Reporting public education. A system that is required to perform public education must provide copies of public education materials and certification that distribution of said materials is being conducted in accordance with this subsection to the executive director within ten days after the delivery of the materials to the public.

(6) Reporting consumer notification. No later than three months following the end of the monitoring period, each system must mail a sample copy of the consumer notification of tap results to the executive director along with a certification that the notification has been distributed in a manner consistent with the requirements of subsection (j) of this section.

(7) Corrosion control reporting. Systems that are required to perform corrosion control studies and install corrosion control treatment shall report all information required under subsection (f) of this section. Corrosion control treatment data shall be reported as required by the executive director. Systems shall report the following information listed in this paragraph.

(A) Systems demonstrating that they have already optimized corrosion control, must provide all information required in subsection (f) of this section.

(B) Systems that are recommending optimal corrosion control treatment must provide all supporting documentation for their recommendation regarding optimal corrosion control treatment under 40 CFR §141.82(a).

(C) Systems that are required to evaluate the effectiveness of corrosion control treatments under subsection (f) of this section, must submit the information required by that section.

(D) Systems required to install optimal corrosion control designated by the executive director under 40 CFR §141.82(d), must submit a letter certifying that the system has completed installing that treatment.

(8) Reporting source treatment. A system that is required to install source water lead or copper removal treatment must certify in writing that the system has completed installing the approved treatment within 24 months after the executive director approved that treatment.

(9) Reporting system conditions and facility changes. Systems must report changes of system conditions and facilities that may impact corrosion to the executive director.

(A) The water system must inform the executive director of the identity of treated and non-treated entry points and their seasonal use, if any, and demonstrate that the WQPs represent water quality and treatment conditions throughout the system.

(B) At a time specified by the executive director, or if no specific time is designated by the executive director, then as early as possible prior to the addition of a new source or any long-term change in water treatment, a water system deemed to have optimized corrosion control or subject to reduced tap sampling shall submit written documentation to the executive director describing the change or addition. The water

system may not implement the addition of a new source or long-term change in treatment until notified in writing that the change is approved by the executive director. Examples of long-term treatment changes include the addition of a new treatment process or modification of an existing treatment process. Examples of modifications include switching secondary disinfectants, switching coagulants (for example, alum to ferric chloride), and switching corrosion inhibitor products (for example, orthophosphate to blended phosphate). Long-term changes can include dose changes to existing chemicals if the system is planning long-term changes to its finished water pH or residual inhibitor concentration. Long-term treatment changes would not include chemical dose fluctuations associated with daily raw water quality changes.

(10) Other reporting. Any system which collects sampling data in addition to that required by this section shall report the results to the executive director within the first ten days following the end of the applicable monitoring period during which the samples are collected.

(11) Reporting lead service line replacement. A water system that is replacing lead service lines must certify that lead service lines have been replaced in accordance with directives of the executive director.

(j) Consumer notification. All water systems must provide a consumer notice of lead tap water monitoring results to persons served at the sites (taps) that are tested.

(1) Timing of consumer notification. A water system must provide the consumer notice as soon as practical, but no later than 30 days after the system receives the tap sampling results.

(2) Content of consumer notification. The consumer notice must include the results of lead tap sampling for the tap that was tested, an explanation of the health effects of lead, list steps consumers can take to reduce exposure to lead in drinking water, and contact information for the water utility. The notice must also provide the maximum contaminant level goal and the action level for lead and the definitions for these two terms from 40 CFR §141.153(c).

(3) Delivery of consumer notification. The consumer notice must be provided to persons served at the tap that was tested, either by mail or by another method approved by the executive director. Upon approval by the executive director, a nontransient, noncommunity water system may post the results on a bulletin board in the facility to allow users to review the information. The system must provide the notice to customers at sample taps tested, including consumers who do not receive water bills.

(k) Public education. A public water system that exceeds the lead action level based on tap water samples collected in accordance with subsection (c) of this section shall deliver the public education materials in accordance with the requirements of this subsection.

(1) Content of public education materials. Public water [Water] systems must include the elements in this paragraph in their printed materials in the same order as listed. Language in subparagraphs (A), (B), and (F) of this paragraph must be included in the materials, exactly as written, except for the text in brackets for which the public water system must include system-specific information. Any additional information presented by a public water system must be consistent with the information below and be in plain language that can be understood by the general public. Water systems must submit all written public education materials to the executive director prior to delivery. Public education materials must be approved by the executive director prior to delivery.

(A) "IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. {INSERT NAME OF WATER SYSTEM} found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water."

(B) "*Health effects of lead*." Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it

can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development."

(C) Sources of lead.

(i) Explain what lead is.

(ii) Explain possible sources of lead in drinking water and how lead enters drinking water. Include information on home and building plumbing materials and service lines that may contain lead.

(iii) Discuss other important sources of lead exposure in addition to drinking water such as lead-based paint or lead-contaminated soils.

(D) Discuss the steps the consumer can take to reduce their exposure to lead in drinking water.

(i) Encourage running the water to flush out the lead.

(ii) Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.

(iii) Explain that boiling water does not reduce lead levels.

(iv) Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.

(v) Suggest that parents have their child's blood tested for lead.

(E) Explain why there are elevated levels of lead in the system's drinking water (if known) and what the water system is doing to reduce the lead levels in homes and buildings in this area.

(F) "For more information, call us at {INSERT YOUR SYSTEM's PHONE NUMBER} if applicable) or visit our website [Web site] at {INSERT YOUR WEBSITE [WEB SITE] HERE}. For more information on reducing lead exposure around your home or building and the health effects of lead, visit EPA's website [Web site] at *www.epa.gov/lead* or contact your health care provider."

(G) In addition to including the elements specified in subparagraphs (A) - (F) of this paragraph, community water systems must:

(i) tell [Tell] consumers how to get their water tested, and

(ii) discuss [Discuss] lead in plumbing components and the difference between low lead and lead free.

(H) For public water systems serving a large proportion of non-English speaking consumers, as determined by the executive director, the public education materials must contain information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the public education materials or to request assistance in the appropriate language.

(2) Delivery of public education materials by community systems. Systems must provide public education materials meeting the criteria of paragraph (1) of this subsection to the public in accordance with this paragraph.

(A) A community system must directly deliver printed public education materials to all bill paying customers.

(i) The community system must deliver public education materials to local public health agencies even if they are not located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users. The system must contact the local public health agencies directly by phone or in person. The local public health agencies may provide a specific list of additional community

based organizations serving target populations, which may include organizations outside the service area of the water system. If such lists are provided, systems must deliver public education materials to all organizations on the provided lists.

(ii) The community system must contact customers who are most at risk by delivering public education materials to the organizations listed in this clause that are located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users.

(I) Public and private schools or school boards;

(II) Women, Infants and Children (WIC) and Head Start programs;

(III) Public and private hospitals and medical clinics;

(IV) Pediatricians;

(V) Family planning clinics; and

(VI) Local welfare agencies.

(iii) The community system must make a good faith effort to locate organizations of the types listed in this clause within the service area and deliver public education materials to them, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of these organizations from the local public health agencies, even if the agencies are not located within the water system's service area.

(I) Licensed childcare centers;

(II) Public and private preschools; and

(III) Obstetricians-Gynecologists and Midwives.

(iv) The community system must implement at least three activities from one or more categories listed in this clause. The educational content and selection of these activities must be determined in consultation with the executive director.

(I) Public service announcements;

(II) Paid advertisements;

(III) Public area information displays;

(IV) E-mails to customers;

(V) Public meetings;

(VI) Household deliveries;

(VII) Targeted Individual Customer Contact;

(VIII) Direct material distribution to all multi-family homes and institutions; or

(IX) Other methods approved by the executive director.

(v) At least quarterly, the community system must provide information on or in each water bill as long as the system exceeds the action level for lead. The message on the water bill must include the following statement exactly as written except for the text in brackets for which the water system must include system-specific information: "{INSERT NAME OF WATER SYSTEM} found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call {INSERT NAME OF WATER SYSTEM}" Upon written request, the executive director may allow a separate mailing of public education materials to customers if the water system cannot place the information on water bills.

(vi) A community system serving more than 100,000 people must post public education materials on the water system's website [Web site].

(vii) The community system must submit a press release to newspaper, television and radio stations.

(B) With executive director approval, a community public water system serving 3,300 or fewer people may limit certain aspects of their public education programs by distributing the public education materials required by subparagraph (A)(ii) of this paragraph to facilities and organizations served by the public water system that are most likely to be visited regularly by pregnant women and children. In addition:

(i) The executive director may waive the requirement of subparagraph (A)(vii) of this paragraph, to submit press releases to the media, as long as the public water system distributes notices to every household served by the system [The system may be allowed to deliver public education materials to only those potentially affected customers listed in subparagraph (A)(ii) of this paragraph served by the system that are most likely to be visited regularly by pregnant women and children].

(ii) The public water system shall implement at least one of the requirements found in subparagraph (A)(iv) of this paragraph [executive director may waive the requirement of subparagraph (A)(vi) of this paragraph to submit press releases

to the media as long as system distributes notices to every household served by the system].

[(iii) The system may be allowed to perform only one of the additional activities in subparagraph (A)(vii) of this paragraph instead of three activities.]

(C) A community water system may apply to the executive director, in writing, to use only the text specified in paragraph (1)(A) - (F) of this subsection, omitting the text specified in paragraph (1)(G) of this subsection, and to post public education materials as described in paragraph (3) of this subsection, omitting the tasks in subparagraph (A) of this paragraph if:

(i) The system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

(ii) The system provides water as part of the cost of services provided and does not separately charge for water consumption.

(3) Delivery of public education materials by nontransient, noncommunity systems. Systems must provide public education materials meeting the criteria of paragraph (1) of this subsection to the public in accordance with this paragraph.

(A) The system must post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system.

(B) The system must distribute informational brochures on lead in drinking water to each person served by the nontransient, noncommunity water system. The executive director may allow the system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.

(4) Frequency and timing of public education. A system that exceeds the lead action level must provide educational materials meeting the content requirements of paragraph (1) of this subsection to the public within 60 days after the end of the monitoring period in which the exceedance occurred. For systems that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or, if the executive director has established an alternate monitoring period, the last day of that period.

(A) Frequency and timing of public education activities for community systems. As long as a community water system exceeds the action level, it must repeat the activities of this paragraph at the frequency contained in this paragraph.

(i) A community system shall repeat tasks contained in paragraph (2)(A)(v) of this subsection every billing cycle.

(ii) A community system serving a population greater than 100,000 shall post and retain material on a publicly accessible website [Web site].

(iii) The community system shall repeat the press release task in paragraph (2)(A)(vii) of this subsection twice every 12 months on a schedule agreed upon with the executive director.

(B) Frequency and timing of public education activities for nontransient, noncommunity systems. A nontransient, noncommunity water system shall maintain the posting required by repeat the tasks contained in paragraph (3) of this subsection at least once during each calendar year in which the system exceeds the lead action level. Posted materials must remain posted until the system no longer exceeds the lead action level, and the executive director informs the system that the posting may be discontinued.

(C) Extension to public education start date. A nontransient, noncommunity system may request, and the executive director can approve, an extension for starting public education beyond the 60-day requirement on a case-by-case basis. The request and approval must be made in writing prior to the 60-day deadline.

(D) Discontinuing public education. A system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period conducted pursuant to subsection (c) of

this section. Such a system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any monitoring period.

(5) Notifying the executive director of public education activities. Any water system that is subject to the public education requirements of this subsection shall, within ten days after the end of each period in which the system is required to perform public education, send written documentation to the executive director containing all the elements in this paragraph.

(A) The system must provide documentation that the system has delivered the public education materials that meet the content requirements in paragraph (1) of this subsection and the delivery requirements in paragraph (2) or (3) of this subsection.

(B) The system must provide a list of all the newspapers, radio stations, television stations, and facilities and organizations to which the system delivered public education materials during the period in which the system was required to perform public education tasks.

(C) The system must resubmit certification of delivery of public education materials every time it distributes materials. Unless required by the executive director, a system that previously has submitted the information required by

subparagraphs (A) and (B) of this paragraph need not resubmit the information as long as there have been no changes in the distribution list.

(l) Compliance determination. All applicable water systems shall determine compliance based on monitoring and reporting requirements established in this section or contained in 40 CFR Part 141, Subpart I.

(1) Compliance determination with action levels of subsection (b) of this section for lead and copper shall be based on the 90th percentile as described in this paragraph.

(A) The 90th percentile lead and copper levels shall be computed as provided in this subparagraph:

(i) Determination of 90th percentile levels shall be obtained by ranking the results of lead and copper samples collected during a monitoring period in ascending order (lowest concentration is sample Number 1; highest concentration are samples Numbers 10, 20, 30, 40, 50, and so on), up to the total number of samples collected.

(ii) The number of samples collected during the monitoring period shall be multiplied by 0.9. The concentration of lead and copper in sample with

the number yielded by this calculation is the 90th percentile level, for systems serving 100 or more people.

(iii) For water systems serving fewer than 100 people, the 90th percentile level is computed by taking the average of the highest two sample results.

(iv) For a public water system that has been allowed by the executive director to collect fewer than five samples in accordance with subsection (c)(1)(F) of this section, the sample result with the highest concentration is considered the 90th percentile value.

(B) A sample invalidated under this section does not count toward determining lead or copper 90th percentile levels or toward meeting the minimum number of tap sample requirements.

(C) Monitoring approved by the executive director and conducted by systems in addition to the minimum requirements of this section shall be considered by the executive director in making any determination of compliance.

(D) The system is in compliance with the lead or copper action levels if the 90th percentile level of lead or copper, respectively, is equal to or less than the action levels specified in subsection (b)(1) of this section.

(2) Compliance determination for water quality parameters. If a water system fails to meet the OWQP values or ranges approved by the executive director, it is out of compliance with this section. WQP confirmation sample results will be included in compliance determination.

(A) A OWQP-range excursion occurs whenever the daily value for one or more WQPs measured at a sampling location is below a minimum value or outside a range approved by the executive director. The executive director has the discretion to delete results of obvious sampling errors from this calculation. Daily values are calculated as follows.

(i) Water systems that collect more than one WQP measurement in one day must record the daily value as an average of all WQP values collected during the day regardless of whether the measurements are collected through continuous monitoring, grab sampling, or a combination of both.

(ii) On days when only one measurement for the WQP is collected at the sampling location, the daily value shall be the result of that measurement.

(iii) On days when no measurement is collected for the WQP at the sampling location, the daily value last calculated on the most recent day shall serve as the daily value.

(B) Compliance periods for this paragraph are two six-month periods, January 1 to June 30, and July 1 to December 31. A water system is out of compliance with this subsection for a six-month period if the water system has OWQP excursions for any approved range for more than nine days during that period.

(C) The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and the executive director in making any determinations under this section.

(D) The executive director may delete results of obvious sampling errors from this calculation.

(3) Compliance determination for source water treatment. A system required to install and operate source water treatment for lead or copper under subsection (g) of this section is out of compliance if the level of lead or copper in any sample collected under subsection (d)(2)(D)(v) of this section is greater than the MPL designated by the executive director. The initial and confirmation sample shall be averaged in determining compliance. Any sample value below the method detection limit shall be considered to be zero. Any value above the method detection limit but below the PQL shall either be considered as the measured value or be considered one-half the PQL.

(4) Compliance determination for public education. Failure to deliver public education materials required under subsection (k) of this section to customers is a public

notification violation. Failure to certify delivery of public education materials to the executive director is a reporting violation.

(5) Failure to conduct or report any requirements of this section shall constitute a monitoring, reporting or treatment technique violation and shall be a violation of these standards.

(m) Lead service line replacement. The provisions of 40 CFR §141.84 and §141.90(e) relating to lead service line replacement are adopted by reference. Any system exceeding the lead action level after implementation of applicable corrosion control and source water treatment requirements shall complete the lead service line replacement requirements contained in 40 CFR §141.84. Any such water system shall submit reports required under 40 CFR §141.90(e).

(n) Additional sampling. The executive director may require systems to sample at additional times or locations in order to ensure that systems maintain minimal levels of corrosion in the distribution system.

§290.118. Secondary Constituent Levels.

(a) Applicability for secondary constituents. The requirements for secondary constituents apply to all public water systems. Water that does not meet the secondary constituent levels may not be used for public drinking water without written approval

from the executive director. When drinking water that does not meet the secondary constituent levels is accepted for use by the executive director, such acceptance is valid only until such time as water of acceptable chemical quality can be made available at reasonable cost to the area(s) in question.

(b) Secondary constituent levels. The maximum secondary constituent levels are as follows.

Figure: 30 TAC §290.118(b) (No change to the figure as it currently exists in TAC.)

CONSTITUENT	LEVEL (mg/l except where otherwise stated)
Aluminum	0.05 to 0.2
Chloride	300
Color	15 color units
Copper	1.0
Corrosivity	Non-corrosive
Fluoride	2.0
Foaming agents	0.5
Hydrogen sulfide	0.05
Iron	0.3
Manganese	0.05
Odor	3 Threshold Odor Number
pH	>7.0
Silver	0.1
Sulfate	300
Total Dissolved Solids	1,000
Zinc	5.0

(c) Monitoring frequency for secondary constituents. All public water systems shall monitor for secondary constituents at the following frequency.

(1) Each groundwater source shall be sampled once every three years at the entry point to the distribution system.

(2) Each surface water source shall be sampled annually at the entry point to the distribution system.

(3) Each of the sampling frequencies listed in paragraph (3) of this subsection constitute one round of sampling for groundwater and surface water systems, respectively.

(d) Analytical requirements for secondary constituents. All analyses for determining compliance with the provisions of this subsection shall be conducted in accordance with §290.119 of this title (relating to Analytical Procedures) at a facility certified by the executive director.

(e) Reporting requirements for secondary constituents. Any owner or operator of a public water system subject to the provisions of this section is required to report to the executive director the results of any test, measurement, or analysis required to be made by this section within ten days following receipt of results of such test, measurement, or analysis.

(f) Compliance determination for secondary constituents. Compliance with the requirements of this subsection shall be based on the following criteria:

(1) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation;

(2) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation; and

(3) A public water system that exceeds the secondary constituent levels in subsection (b) of this section commits a secondary constituents level violation.

(g) Public notification for secondary constituents. Public notification must be consistent with the requirements of §290.122 of this title (relating to Public Notification).

(1) Community and nontransient, noncommunity water systems that exceed the secondary [maximum] constituent level for fluoride but are below the maximum contaminant level listed in §290.106 of this title (relating to Inorganic Contaminants) must notify the public. The notice must be made annually by including it with the water bill or by separate mailing to all customers. The form and content of the notice shall be as prescribed by the executive director.

(2) If a system exceeds the secondary constituent levels, notice must be given to new customers and in the annual Consumer Confidence Report [consumer confidence report].

§290.119. Analytical Procedures.

(a) Acceptable laboratories. Samples collected to determine compliance with the requirements of this chapter shall be analyzed at accredited or approved laboratories.

(1) Samples used to determine compliance with the maximum contaminant levels, samples used to determine compliance with action level, and raw groundwater source monitoring requirements of this subchapter, and samples for microbial contaminants must be analyzed by a laboratory accredited by the executive director in accordance with Chapter 25 of this title (relating to Environmental Testing Laboratory Accreditation and Certification). These samples include:

(A) compliance samples for synthetic organic chemicals;

(B) compliance samples for volatile organic chemicals;

(C) compliance samples for inorganic contaminants;

(D) compliance samples for radiological contaminants;

(E) compliance samples for microbial contaminants;

(F) compliance samples for total trihalomethanes (TTHM);

(G) compliance samples for haloacetic acid-group of five (HAA5);

(H) compliance samples for chlorite;

(I) compliance samples for bromate; and

(J) compliance samples for lead and copper.

(2) Samples used to determine compliance with the treatment technique requirements and maximum residual disinfectant levels (MRDLs) of this subchapter must be analyzed by a laboratory approved by the executive director. These samples include:

(A) compliance samples for turbidity treatment technique requirements;

(B) compliance samples for the chlorine MRDL;

(C) compliance samples for the chlorine dioxide MRDL;

(D) compliance samples for the combined chlorine (chloramine) MRDL;

(E) compliance samples for the disinfection byproduct precursor treatment technique requirements, including alkalinity, total organic carbon, dissolved organic carbon analyses, and specific ultraviolet absorbance;

(F) samples used to monitor chlorite levels at the point of entry to the distribution system; and

(G) samples used to determine pH.

(3) Non-compliance tests, such as control tests taken to operate the system, may be run in the plant or at a laboratory of the system's choice.

(b) Acceptable analytical methods. Methods of analysis shall be as specified in 40 Code of Federal Regulations (CFR) or by any alternative analytical technique as specified by the executive director and approved by the Administrator under 40 CFR §141.27. Copies are available for review in the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087. The following National Primary Drinking Water Regulations set forth in Title 40 CFR are adopted by reference:

(1) 40 CFR §141.852(a) [section 141.21(f)] for microbiological analyses;

(2) 40 CFR §141.74(a)(1) [section 141.74(a)(1)] for turbidity analyses;

(3) 40 CFR §141.23(k) [section 141.23(k)] for inorganic analyses;

(4) 40 CFR §141.24(e) - (g) [section 141.24(e), (f), and (g)] for organic analyses;

(5) 40 CFR §141.25 [section 141.25] for radionuclide analyses;

(6) 40 CFR §141.131(a) and (b) [section 141.131(a) and (b)] for disinfection byproduct methods and analyses;

(7) 40 CFR §141.131(c) [section 141.131(c)] for disinfectant analyses other than ozone, and 40 CFR §141.74(b) [141.74(b)] for ozone disinfectant;

(8) 40 CFR §141.131(d) [section 141.131(d)] for alkalinity analyses, bromide and magnesium, total organic carbon analyses, dissolved organic carbon analyses, specific ultraviolet absorbance analyses, and pH analyses;

(9) 40 CFR §141.89 [section 141.89] for lead and copper analyses and for water quality parameter analyses that are performed as part of the requirements for lead and copper;

(10) 40 CFR §141.402(c) [section 141.402(c)] for groundwater source microbiological analyses; and

(11) if a method is not contained in this section, a drinking water quality method can be approved for analysis if it is listed in 40 CFR Part 141, Subpart C, Appendix A.

(c) The definition of detection contained in 40 CFR §141.151(d) is adopted by reference.

§290.121. Monitoring Plans.

(a) Applicability. All public water systems shall maintain an up-to-date chemical and microbiological monitoring plan. Monitoring plans are subject to the review and approval of the executive director. A copy of the monitoring plan must be maintained at each water treatment plant and at a central location.

(b) Monitoring plan requirements. The monitoring plan shall identify all sampling locations, describe the sampling frequency, and specify the analytical procedures and

laboratories that the public water system will use to comply with the monitoring requirements of this subchapter.

(1) The monitoring plan shall include information on the location of all required sampling points in the system. Required sampling locations for regulated chemicals are provided in §290.106 of this title (relating to Inorganic Contaminants), §290.107 of this title (relating to Organic Contaminants), §290.108 of this title (relating to Radionuclides Other than Radon), §290.109 of this title (relating to Microbial Contaminants), §290.110 of this title (relating to Disinfectant Residuals), §290.111 of this title (relating to Surface Water Treatment), §290.112 of this title (relating to Total Organic Carbon (TOC)), §290.113 of this title (relating to Stage 1 Disinfection Byproducts (TTHM and HAA5)), §290.114 of this title (relating to Other Disinfection Byproducts (Chlorite and Bromate)), §290.115 of this title (relating to Stage 2 Disinfection Byproducts (TTHM and HAA5)), §290.116 of this title (Relating to Groundwater Corrective Actions and Treatment Techniques), §290.117 of this title (relating to Regulation of Lead and Copper), and §290.118 of this title (relating to Secondary Constituent Levels).

(A) The location of each sampling site at a treatment plant or pump station must be designated on a plant schematic. The plant schematic must show all water pumps, flow meters, unit processes, chemical feed points, and chemical monitoring points. The plant schematic must also show the origin of any flow stream that is recycled at the treatment plant, any pretreatment that occurs before the recycle stream is returned

to the primary treatment process, and the location where the recycle stream is reintroduced to the primary treatment process.

(B) Each entry point to the distribution system shall be identified in the monitoring plan as follows:

(i) a written description of the physical location of each entry point to the distribution system shall be provided; or

(ii) the location of each entry point shall be indicated clearly on a distribution system or treatment plant schematic.

(C) The address of each sampling site in the distribution system shall be included in the monitoring plan or the location of each distribution system sampling site shall be designated on a distribution system schematic. The distribution system schematic shall clearly indicate the following:

(i) the location of all pump stations in the distribution system;

(ii) the location of all ground and elevated storage tanks in the distribution system; and

(iii) the location of all chemical feed points in the distribution system.

(D) The system must revise its monitoring plan if changes to a plant or distribution system require changes to the sampling locations.

(2) The monitoring plan must include a written description of sampling frequency and schedule.

(A) The monitoring plan must include a list of all routine samples required on a daily, weekly, monthly, quarterly, annual, or less frequent basis and identify the sampling location where the samples will be collected.

(B) The system must maintain a current record of the sampling schedule.

(3) The monitoring plan shall include the public water system's Sample Siting Plan as required by §290.109(d)(6) of this title. The public water system's Sample Siting Plans shall include a list of all routine and repeat microbial sample sites as required by §290.109(d) of this title. The repeat sample sites, as required by §290.109(d)(3) of this title, shall be associated to their originating routine microbial sample sites. The Sample Siting Plan shall include all groundwater sources and any

associated sampling points necessary to meet the requirements of §290.109(d) of this title.

(4) [(3)] The monitoring plan must identify the analytical procedures that will be used to perform each of the required analyses.

(5) [(4)] The monitoring plan must identify all laboratory facilities that may be used to analyze samples required by this chapter.

(6) [(5)] The monitoring plan shall include a written description of the methods used to calculate compliance with all maximum contaminant levels, maximum residual disinfectant levels, and treatment techniques that apply to the system.

(7) [(6)] The monitoring plan shall include any groundwater source water monitoring plan developed under §290.109(d)(4) [§290.109(c)(4)] of this title to specify well sampling for triggered coliform monitoring.

(8) [(7)] The monitoring plan shall include any initial distribution system evaluation compliance documentation required by §290.115(c)(5) of this title. The monitoring plan must be revised to show Stage 2 sample sites by the date shown in Figure: 30 TAC §290.115(a)(2) titled "Date to Start Stage 2 Compliance."

(9) [(8)] The monitoring plan shall include any raw surface water monitoring plan required under §290.111 of this title.

(c) Reporting requirements. All public water systems shall maintain a copy of the current monitoring plan at each treatment plant and at a central location. The water system must update the monitoring plan when the water system's sampling requirements or protocols change.

(1) Public water systems that treat surface water or groundwater under the direct influence of surface water must submit a copy of the monitoring plan to the executive director upon development and revision.

(2) Public water systems that treat groundwater that is not under the direct influence of surface water or purchase treated water from a wholesaler must develop a monitoring plan and submit a copy of the monitoring plan to the executive director upon request.

(3) All water systems must provide the executive director with any revisions to the plan upon request.

(d) Compliance determination. Compliance with the requirements of this section shall be determined using the following criteria.

(1) A public water system that fails to submit an administratively complete monitoring plan by the required date documented in a request from the executive director or fails to submit updates to a plan when changes are made to a system's surface water treatment commits a reporting violation.

(2) A public water system that fails to maintain an up-to-date monitoring plan commits a monitoring violation.

(e) Public notification. A community system that commits a violation described in subsection (d) of this section shall notify its customers of the violation in the next Consumer Confidence Report [consumer confidence report] that is issued by the system.

§290.122. Public Notification.

(a) Tier 1 public [Public] notification requirements for acute violations or situations with significant potential to have serious adverse effects on human health as a result of short-term exposure which require a Tier 1 public notice as described in this subsection. The owner or operator of a public water system must notify persons served by their system of any maximum contaminant level [limit] (MCL), maximum residual disinfectant level (MRDL), treatment technique violation, or other situation that poses an acute threat to public health. Each notice required by this section must meet the requirements of subsection (d) of this section.

(1) Situations that pose an acute threat to public health include:

(A) a violation of the *Escherichia coli* (*E. coli*) MCL as described in §290.109(g)(1)(A) - (D) of this title [acute MCL for microbial contaminants as defined in §290.109(f)(1) of this title] (relating to Microbial Contaminants);

(B) an acute turbidity issue at a treatment plant that is treating surface water or groundwater under the direct influence of surface water, specifically:

(i) a combined filter effluent turbidity level above 5.0 nephelometric turbidity units (NTU);

(ii) a combined filter effluent turbidity level above 1.0 NTU at a treatment plant using membrane filters; [or]

(iii) a combined filter effluent turbidity level above 1.0 NTU at a plant using other than membrane filters at the discretion of the executive director after consultation with the system; [or]

(iv) failure of a system with treatment other than membrane filters to consult with the executive director within 24 hours after a combined filter effluent reading of 1.0 NTU;

(v) failure of a system to meet turbidity level, monitoring, and/or reporting requirements as described in §290.111(i)(3) of this title (relating to Surface Water Treatment); or

(vi) failure of a system to meet treatment, turbidity level, monitoring, and/or reporting requirements as described in §290.111(i)(4) of this title;

(C) a violation of the MCL for nitrate or nitrite as defined in §290.106(f)(2) of this title (relating to Inorganic Contaminants);

(D) a violation of the acute MRDL for chlorine dioxide as defined in §290.110(f)(5)(A) or (B) of this title (relating to Disinfectant Residuals);

(E) occurrence of a waterborne disease outbreak;

(F) Detection of *E. coli* or other fecal indicators in source water samples as specified in §290.109(b)(3) [§290.109(b)(2)] of this title, which requires a public notice to be issued within 24 hours of notification of the positive sample; and

(G) other situations deemed by the executive director to pose an acute risk to human health.

(2) The initial Tier 1 acute public notice and/or boil water notice required by this subsection shall be issued as soon as possible, but in no case later than 24 hours after the violation or situation is identified. The initial public notice for an acute violation or situation shall be issued in one or more of the following manners that are reasonably calculated to reach persons served by the public water system within the required time period [manner].

(A) The owner or operator of a public water system with an acute microbiological or turbidity violation as described in paragraph (1)(A) or (B) of this subsection shall include a boil water notice issued in accordance with the requirements of §290.46(q) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems). Public water systems are not required to issue a boil water notice under the conditions as referenced in paragraph (1)(B)(vi) of this subsection, unless required at the discretion of the executive director in accordance with §290.46(q)(5) of this title.

(B) The owner or operator of a community water system shall furnish a copy of the notice to the radio and television stations serving the area served by the public water system.

(C) The owner or operator of a community water system shall publish the notice in a daily newspaper of general circulation in the area served by the system. If the area is not served by a daily newspaper of general circulation, notice shall instead be

issued by direct delivery or by continuous posting in conspicuous places within the area served by the system. Other methods of delivery may include electronic delivery or alert systems (e.g., reverse 911).

(D) The owner or operator of a noncommunity water system shall issue the notice by direct delivery or by continuously posting the notice in conspicuous places within the area served by the water system. Other methods of delivery may include electronic delivery or alert systems (e.g., reverse 911).

(E) If notice is provided by posting, the posting must remain in place for as long as the violation or situation exists or seven days, whichever is longer.

(3) The owner or operator of a water system required to issue an initial notice for an acute MCL or treatment technique violation shall issue additional notices. The additional public notices for acute violations shall be issued in the following manner.

(A) Not later than 45 days after the violation, the owner or operator of a community water system shall notify persons served by the system using mail (by direct mail or with the water bill) or hand delivery. The executive director may waive mail or hand delivery if it is determined that the violation was corrected within the 45-day period. The executive director must make the waiver in writing and within the 45-day period.

(B) The owner or operator of a community water system must issue a notice at least once every three months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation exists.

(C) If the owner or operator of a noncommunity water system issued the initial notice by continuous posting, posting must continue for as long as the violation exists and in no case less than seven days. If the owner or operator of a noncommunity water system issued the initial notice by direct delivery, notice by direct delivery must be repeated at least every three months for as long as the violation exists.

[(4) The owner or operator of the public water system must issue a notice when the public water system has corrected the acute violation or situation. This notice must be issued in the same manner as the original notice was issued.]

(4) [(5)] Copies of all notifications required under this subsection must be submitted to the executive director within ten days of its distribution.

(b) Tier 2 public [Public] notification requirements for other MCL, MRDL, or treatment technique violations and for variance and exemption violations which are violations and situations with potential to have serious adverse effects on human health, as defined in this subsection. The owner or operator of a public water system must notify persons served by their system of any MCL, MRDL, or treatment technique violation other than those described in subsection (a)(1) of this section and of any violation involving a

variance or exemption requirement. Each notice required by this section must meet the requirements of subsection (d) of this section.

(1) Violations that require notification under this subsection include:

(A) any violation of an MCL, MRDL, or treatment technique not listed under subsection (a) of this section;

(B) failure to comply with the requirements of any variance or exemption granted under §290.102(d) of this title (relating to General Applicability);

(C) failure for a groundwater system to take corrective action, including uncorrected significant deficiencies, or failure to maintain at least 4-log treatment of viruses (using inactivation, removal, or a combination of 4-log virus inactivation and removal approved by the executive director) before or at the first customer under §290.116 of this title (relating to Groundwater Corrective Actions and Treatment Techniques); or

(D) failure to perform any <u>three</u> [3] months of raw surface water monitoring as required by §290.111(b) of this title [(relating to Surface Water Treatment)] or request bin classification from the executive director under §290.111(c)(3)(A) of this title; or

(E) other violations or situations deemed appropriate by the executive director that pose a non-acute risk to human health.

(2) The initial Tier 2 public notice for any violation, situation, or significant deficiency identified in this subsection must be issued as soon as possible, but in no case later than 30 days after the violation is identified. The initial public notice shall be issued in the following manner.

(A) The owner or operator of a community water system shall issue the notice by:

(i) mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

(ii) any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by the notice required in clause (i) of this subparagraph. Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.) Other methods may include: publication in a local newspaper; delivery of multiple copies for distribution by customers that provide drinking water to others (e.g., apartment building owners or large private employers); continuous posting in conspicuous public

places within the area served by the system or on the Internet; electronic delivery or alert systems (e.g., reverse 911); or delivery to community organizations.

(B) The owner or operator of a noncommunity water system shall issue the notice by:

(i) posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and

(ii) any other method reasonably calculated to reach other persons served by the system if they would not normally be reached by the notice. Such persons may include those served who may not see a posted notice because the posted notice is not in a location they routinely pass by. Other methods may include: publication in a local newspaper or newsletter distributed to customers; use of e-mail to notify employees or students; electronic delivery or alert systems (e.g., reverse 911); or, delivery of multiple copies in central locations (e.g., community centers).

(C) If notice is provided by posting, the posting must remain in place for as long as the violation exists or seven days, whichever is longer.

(3) The owner or operator of a system required to issue an initial violation notice shall issue additional notices. The additional notices shall be issued in the following manner.

(A) The owner or operator of a community water system must issue a notice at least once every three months by mail delivery (by direct mail or with the water bill) or by direct delivery, for as long as the violation exists.

(B) If the owner or operator of a noncommunity water system issued the initial notice by continuously posting the notice, the posting must continue for as long as the violation exists, and in no case less than seven days. If the owner or operator of a noncommunity water system issued the initial notice by direct delivery, notice by direct delivery must be repeated at least every three months for as long as the violation exists.

[(4) The owner or operator of the public water system must issue a notice when the public water system has corrected the violation. This notice must be issued in the same manner as the original notice was issued.]

(c) Tier 3 public [Public] notification requirements for other violations, situations, variances, exemptions as defined in this subsection. The owner or operator of a public water system who fails to perform monitoring required by this chapter, fails to comply with a testing procedure established by this chapter, or is subject to a variance or

exemption granted under §290.102(b) of this title shall notify persons served by the system. Each notice required by this section must meet the requirements of subsection (d) of this section.

(1) Violations or other situations that require notification as described in this subsection [section] include:

(A) exceedance of the secondary constituent levels (SCL) for fluoride;

(B) failure to perform monitoring or reporting required by this subchapter;

(C) failure to comply with the analytical requirements or testing procedures required by this subchapter;

(D) operating under a variance or exemption granted under §290.102(b) of this title; [and]

(E) failure to maintain records on recycle practices as required by §290.46(f)(3)(C)(iii) of this title; [.]

(F) a community and nontransient, noncommunity public water system shall notify its customers of the availability of unregulated contaminant monitoring results, as required under 40 Code of Federal Regulations (CFR) §141.207;

(G) failure of a community and nontransient, noncommunity water public water system to notify of the availability of unregulated contaminant monitoring results, as required under 40 CFR §141.207;

(H) failure of a public water system to maintain any assessment form, regardless of who conducts the assessment, and documentation of corrective actions completed as a result of those assessments, or other available summary documentation of the sanitary defects and corrective actions taken under §290.109 of this title;

(I) failure of a public water system to maintain a record of any repeat sample taken that meets the criteria for an extension of the 24-hour period for collecting repeat samples under §290.109 of this title;

(J) other violations or situations deemed by the executive director to pose an acute risk to human health or with significant potential to have serious adverse effects on human health as a result of short-term exposure may require a Tier 1 public notice as described in subsection (a)(2) of this section; and

(K) other violations or situations at the, discretion of the executive director, may require a Tier 2 public notice as described in subsection (b)(2) of this section.

(2) The initial Tier 3 public notice issued pursuant to this section shall be issued no later than one year after the public water system learns of the violation or situation or begins operating under a variance or exemption. Following the initial notice, the public water system shall repeat the notice annually for as long as the violation, variance, exemption, or other situation persists. If the public notice is posted, the notice shall remain in place for as long as the violation, variance, exemption, or other situation persists, but in no case less than seven days even if the violation or situation is resolved [within three months of the violation or the granting of a variance or exemption]. The initial public notice shall be issued in the following manner.

(A) The owner or operator of a community water system shall issue the notice by mail or other direct delivery to each customer receiving a bill and to other service connections. The owner or operator of a noncommunity water system shall issue the notice by either posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection. Other methods of delivery may include electronic delivery or alert systems (e.g., reverse 911).

(B) The owner or operator of any public water system shall also notify the public using another method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by the notice required in subparagraph (A) of this paragraph. Such persons may include people who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). These other methods may include publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers); posting in public places or on the Internet; or delivery to community organizations. Other methods of delivery may include electronic delivery or alert systems (e.g., reverse 911).

(C) For community public water systems, the Consumer Confidence Report (CCR) as required under Subchapter H of this chapter (relating to Consumer Confidence Reports) may be used for delivering the initial Tier 3 public notice and all required repeat notices, under the following conditions.

(i) The CCR is provided to persons served no later than 12 months after the public water system learns of the violation or situation as described under paragraph (1) of this subsection.

(ii) The Tier 3 notice contained in the CCR follows the content requirements under §290.272 of this title (relating to Content of the Report).

(iii) The CCR is distributed following the delivery requirements under §290.274 of this title (relating to Report Delivery and Recordkeeping.

(D) [(C)] If notice is provided by posting, the posting must remain in place for as long as the violation exists or seven days, whichever is longer.

(3) The owner or operator of a system required to issue an initial violation notice shall issue additional notices. The additional notices shall be issued in the following manner.

(A) The owner or operator of a community water system shall issue repeat notices at least once every 12 months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation exists or variance or exemption remains in effect. Repeat public notice may be included as part of the CCR as described in paragraph (2) of this subsection [Consumer Confidence Report].

(B) If the owner or operator of a noncommunity water system issued the initial notice by continuously posting the notice, the posting must continue for as long as the violation exists, and in no case less than seven days. If the owner or operator of a noncommunity water system issued the initial notice by direct delivery, notice by direct delivery must be repeated at least every 12 months for as long as the violation exists.

[(4) The owner or operator of the public water system must issue a notice when the public water system has corrected the violation. This notice must be issued in the same manner as the original notice was issued.]

(d) Each public notice must conform to the following general requirements.

(1) The notice must contain a clear and readily understandable explanation of the violation, significant deficiency, or situation that led to the notification. The notice must not contain very small print, unduly technical language, formatting, or other items that frustrate or defeat the purpose of the notice.

(2) If the notice is required for a specific event or significant deficiency, it must state when the event occurred or the date the significant deficiency was identified by the executive director.

(3) For notices required under subsections (a), (b), or (c)(1)(A) of this section, the notice must describe potential adverse health effects.

(A) For MCL, MRDL, or treatment technique violations or situations (including uncorrected significant deficiencies), the notice must contain the mandatory federal contaminant-specific language contained in 40 CFR Part 141, [Code of Federal

Regulations (CFR)] Subpart Q, Appendix B, in addition to any language required by the executive director.

(B) For fluoride SCL violations, the notice must contain the mandatory federal contaminant-specific language contained in 40 CFR §141.208, in addition to any language required by the executive director.

(C) For failure to perform any three [3] months of raw surface water monitoring or request bin classification from the executive director, the notice must contain the mandatory federal contaminant specific language contained in 40 CFR §141.211(d)(1) and (2), respectively, in addition to any language required by the executive director.

(D) The notice must describe the population at risk, especially subpopulations particularly vulnerable if exposed to the given contaminant.

(4) The notice must state what actions the water system is taking to correct the violation or situation, and when the water system expects to return to compliance. For groundwater systems with significant deficiencies, the notice must contain the executive director-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed.

(5) The notice must state whether alternative drinking water sources should be used, and what other actions consumers should take, including when they should seek medical help, if known.

(6) Each notice must contain the name, business address and telephone number at which consumers may contact the owner, operator, or designee of the public water system for additional information concerning the notice.

(7) Where appropriate, the notice must be multilingual. The multilingual notice must explain the importance of the notice or provide a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.

(8) The notice shall include a statement to encourage the notice recipient to distribute the public notice to the other persons served.

(9) Systems with variances or exemptions must notify in accordance with 40 CFR §141.205(b).

(10) Systems must notify customers at sampled taps of the results of any required lead or copper analyses and certify completion of the notification to the executive director.

(e) Notice to new billing units. The owner or operator of a community water system must give a copy of the most recent public notice for any outstanding violation of any MCL, or any treatment technique requirement, or any variance or exemption schedule to all new billing units or new hookups prior to or at the time service begins. The owner or operator of a noncommunity water system must continuously post the public notice in conspicuous locations in order to inform new consumers of any continuing violation, variance or exemption, or other situation requiring a public notice for as long as the violation, variance, exemption, or other situation persists.

(f) Proof of public notification. A copy of any public notice required under this section must be submitted to the executive director within ten days of its distribution as proof of public notification. The copies must be mailed to the Water Supply Division, MC 155, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087 <u>or other method of submission as specified by the executive director</u>. Each proof of public notification must be accompanied with a signed Certificate of Delivery.

(g) Notice to consecutive systems. <u>All public water systems shall provide public notice to persons served by the public water system in accordance with this section. All public water systems that are required to issue public notice to persons in accordance with this section, and that sell or otherwise provide drinking water to other public water systems (i.e., consecutive systems), shall provide public notice to the owner or operator of the consecutive system. The consecutive system is responsible for and shall provide public notice to the persons it serves in accordance with this section.</u> [A public water

system that is required to notify its customers must also provide a copy of the notification to the owner or operator of any public water systems that purchase or otherwise receive water from it in the same manner in which they inform their customers. Each public water system that is affected by the subject of the notification is responsible for notification to its own customers.]

(h) Notices given by the executive director. The executive director may give the notice required by this section on behalf of the owner and operator of the public water system following the requirements of this section. The owner or operator of the public water system remains responsible for ensuring that the requirements of this section are met.

(i) If a public water system has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system, the executive director may allow the system to limit distribution of the public notice to only persons served by that portion of the system which is out of compliance. Permission by the executive director for limiting distribution of the notice must be granted in writing.

SUBCHAPTER H: CONSUMER CONFIDENCE REPORTS

§290.272, §290.275

Statutory Authority

The amendments are proposed under Texas Water Code (TWC), §5.102, which establishes the commission's general authority necessary to carry out its jurisdiction; TWC, §5.103, which establishes the commission's general authority to adopt rules; TWC, §5.105, which establishes the commission's authority to set policy by rule; Texas Health and Safety Code (THSC), §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 United States Code, §§300f - 300j-26; and THSC, §341.0315, which requires public water systems to comply with commission rules adopted to ensure the supply of safe drinking water.

§290.272. Content of the Report.

(a) Information on the source of the water delivered must be included in the report.

(1) Each report must identify the source(s) of the water delivered by the community water system by providing information on the type of the water (such as surface water or groundwater) and any commonly used name and location of the body(ies) of water.

(2) If a source water assessment has been completed, the report must notify consumers of the availability of this information and the means to obtain it. In the reports, systems should highlight significant sources of contamination in the source water area if they have readily available information.

(3) If a system has received a source water assessment from the executive director, the report must include a brief summary of the system's susceptibility to potential sources of contamination using language provided by the executive director or written by a water system official and approved by the executive director.

(b) The following explanations must be included in the annual report.

(1) Each report must contain the following definitions.

(A) Level 1 assessment--A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria were found.

(B) Level 2 assessment--A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *Escherichia coli* (*E. coli*) maximum contaminant level (MCL) violation has occurred and/or why total coliform bacteria were found on multiple occasions.

(C) [(A)] Maximum contaminant level goal (MCLG)--The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

(D) [(B)] Maximum contaminant level (MCL)--The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to maximum contaminant level goals as feasible using the best available treatment technology.

(E) [(C)] Maximum residual disinfectant level goal (MRDLG)--The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

(F) [(D)] Maximum residual disinfectant level (MRDL)--The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

(2) The following terms and their descriptions must be included when they appear in the report:

(A) MFL--million fibers per liter (a measure of asbestos);

(B) mrem/year--millirems per year (a measure of radiation absorbed by the body);

(C) NTU--nephelometric turbidity units (a measure of turbidity);

(D) pCi/L--picocuries per liter (a measure of radioactivity);

(E) ppb--parts per billion, or micrograms per liter (µg/L);

(F) ppm--parts per million, or milligrams per liter (mg/L);

(G) ppt--parts per trillion, or nanograms per liter (ng/L); and

(H) ppq--parts per quadrillion, or picograms per liter (pg/L).

(3) A report for a community water system operating under a variance or an exemption of the Safe Drinking Water Act must include a description of the variance or the exemption granted under §290.102(b) of this title (relating to General Applicability).

(4) A report that contains data on a contaminant for which the United States Environmental Protection Agency (EPA) has set a treatment technique (TT) or an action level (AL) must include, depending on the contents of the report, the following definitions.

(A) TT--A required process intended to reduce the level of a contaminant in drinking water.

(B) AL--The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

(c) Information on detected contaminants.

(1) This subsection specifies the requirements for information to be included in each report for detected contaminants subject to mandatory monitoring, excluding *Cryptosporidium*. Mandatory monitoring is required for:

(A) regulated contaminants subject to an MCL, MRDL, AL, or TT; and

(B) unregulated contaminants for which monitoring is required by 40 Code of Federal Regulations (CFR) §141.40, and found in §290.275(4) of this title (relating to Appendices A - D).

(2) The data relating to these detected contaminants must be displayed in one table or in several adjacent tables. Any additional monitoring results that a community water system chooses to include in its reports must be displayed separately.

(3) The data must be derived from data collected to comply with EPA and the commission monitoring and analytical requirements during the previous calendar year, except when a system is allowed to monitor for regulated contaminants less often than once per year. In that case, the table(s) must include the date and results of the most recent sampling, and the report must include a brief statement indicating that the data presented in the report is from the most recent testing done in accordance with the regulations. The report does not need to include data that is older than five years.

(4) For detected regulated contaminants listed under §290.275 of this title, the table(s) must contain:

(A) the MCLs for those contaminants expressed as a number equal to or greater than 1.0 (as provided under §290.275 of this title);

(B) the MCLGs for those contaminants expressed in the same units as the MCLs (as provided for under §290.275 of this title);

(C) if there is no MCL for a detected contaminant, the TT or specific AL applicable to that contaminant; and

(D) for contaminants subject to an MCL, except turbidity, [and] total coliform, fecal coliform, and *E. coli* [coliforms,] the highest contaminant level used to

determine compliance with *National Primary Drinking Water Regulations* (NPDWR) and the range of detected levels.

(i) For contaminants subject to MCLs, except turbidity, total coliform, fecal coliform, and *E. coli*, [and total coliforms,] when sampling takes place once per year or less often, the table(s) must contain the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL.

(ii) When sampling takes place more than once per year at each sampling point, the table(s) must contain the highest average of any of the sampling points and the range of all sampling points expressed in the same units as the MCL.

(iii) In accordance with date requirements included in the table under §290.115(a) of this title (relating to Stage 2 Disinfection Byproducts (TTHM and HAA5)), entitled "Date to Start Stage 2 Compliance," for the MCLs for total trihalomethanes (TTHM) and haloacetic acids (HAA5), systems must include the highest locational running annual average for TTHM and HAA5 and the range of individual sample results for all monitoring locations expressed in the same units as the MCL. If more than one location exceeds the TTHM or HAA5 MCL, the system must include the locational running annual averages for all sampling points that exceed the MCL.

(iv) When compliance with any MCL is determined on a system-wide basis by calculating a running annual average of all samples at all sampling points,

the table(s) must include the average and range of detections expressed in the same units as the MCL.

(v) When the executive director allows the rounding of results to determine compliance with the MCL, rounding should be done after multiplying the results by the factor listed under §290.275 of this title.

(E) When turbidity is reported under §290.111 of this title (relating to Surface Water Treatment), the table(s) must contain the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in that section for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity.

(F) When lead and copper are reported, the table(s) must contain the 90th percentile value of the most recent round of sampling and the number of sampling sites exceeding the AL.

(G) <u>When *E. coli* is reported, the table(s) shall contain the total number of *E. coli* positive samples.</u> [When total coliform is reported, the table(s) must contain either the highest monthly number of positive samples for systems collecting fewer than 40 samples per month or the highest monthly percentage of positive samples for systems collecting at least 40 samples per month.]

[(H) When fecal coliform is reported, the table(s) must contain the total number of positive samples.]

(H) [(I)] The table(s) must contain information on the likely source(s) of detected contaminants based on the operator's knowledge. Specific information regarding contaminants may be available in sanitary surveys or source water assessments and should be used when available. If the operator lacks specific information on the likely source, the report must include one or more typical sources most applicable to the system for any particular contaminant listed under §290.275 of this title.

(i) If a community water system distributes water to its customers from multiple hydraulically independent distribution systems that are fed by different raw water sources, the table(s) must contain a separate column for each service area, and the report must identify each separate distribution system. Systems may produce separate reports tailored to include data for each service area.

(ii) The table(s) must clearly identify any data indicating violations of MCLs, MRDLs, or TTs. The report must contain a clear and readily understandable explanation of the violation. The explanation must include the length of the violation, the potential adverse health effects, and the actions taken by the system to address the violation. To describe the potential health effects, the system must use the relevant language contained under §290.275 of this title.

(5) For detected unregulated contaminants found under §290.275 of this title, for which monitoring is required (except *Cryptosporidium*), the table(s) must contain the average and range of concentrations at which the contaminant was detected. The report must include the following explanation: "Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted."

(d) Information on *Cryptosporidium*, radon, and other contaminants.

(1) If the system has performed any monitoring for *Cryptosporidium*, the report must include a summary of the results of any detections and an explanation of the significance of the results.

(2) If the system has performed any monitoring for radon, which indicates that radon may be present in the finished water, the report must include the results of the monitoring and an explanation of the significance of the results.

(3) If the system has performed additional monitoring, which indicates the presence of other contaminants in the finished water, the executive director strongly encourages systems to report any results which may indicate a health concern. To determine if the results may indicate a health concern, the executive director recommends that systems find out if the EPA has proposed a standard in the NPDWR or

issued a health advisory for any particular contaminant. This information may be obtained by calling the Safe Drinking Water Hotline at (800) 426-4791. The executive director considers detections that are above a proposed MCL or health advisory level to indicate possible health concerns. For such contaminants, the executive director recommends that the report include the results of the monitoring and an explanation of the significance of the results. The explanation should note the existence of a health advisory or a proposed regulation.

(4) Community and nontransient, noncommunity water systems that exceed the secondary constituent level for fluoride as described in §290.118 of this title (relating to Secondary Constituent Levels) but are below the maximum contaminant level listed in §290.106 of this title (relating to Inorganic Contaminants) shall notify the public using the mandatory language as described in 40 CFR §141.208(c).

(e) Compliance with NPDWR. In addition to the requirements in subsection (c)(4)(H)(ii) [(c)(4)(I)(ii)] of this section, the report must note any violation that occurred during the year covered by the report of a requirement listed in paragraphs (1) - (8) of this subsection.

(1) The report must include a clear and readily understandable explanation of each violation of monitoring and reporting of compliance data and explain any adverse health effects and steps the system has taken to correct the violation.

(2) The report must include a clear and readily understandable explanation of each violation of filtration and disinfection prescribed by Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems) and explain any adverse health effects and steps the system has taken to correct the violation. This applies both to systems that have failed to install adequate filtration, disinfection equipment, or processes, and to systems that have had a failure of such equipment or processes, each of which constitutes a violation. In either case, the report must include the following language as part of the explanation of potential adverse health effects: "Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches."

(3) The report must include a clear and readily understandable explanation of each violation of the lead and copper control requirements prescribed by §290.117 of this title (relating to Regulation of Lead and Copper). For systems that fail to take one or more actions prescribed by §290.117(g), (h), and (i) of this title, the report must include the applicable health effects language of §290.275(3) of this title for lead, copper, or both and the steps the system has taken to correct the violation.

(4) The report must include a clear and readily understandable explanation of each violation of TTs for Acrylamide and Epichlorohydrin prescribed by §290.107 of this title (relating to Organic Contaminants). If a system violates these requirements, the

report must include the relevant health effects language from §290.275 of this title and the steps the system has taken to correct the violation.

(5) The report must include a clear and readily understandable explanation of each violation of recordkeeping of compliance data and explain any adverse health effects and steps the system has taken to correct the violation.

(6) The report must include a clear and readily understandable explanation of each violation of special monitoring requirements for unregulated contaminants and special monitoring for sodium as prescribed by 40 CFR §141.40 and §141.41 and explain any adverse health effects and steps the system has taken to correct the violation.

(7) For systems required to conduct initial distribution sampling evaluation (IDSE) sampling in accordance with §290.115(c)(5) of this title, the system is required to include individual sample results for the IDSE when determining the range of TTHM and HAA5 results to be reported in the annual Consumer Confidence Report [consumer confidence report] for the calendar year that the IDSE samples were taken.

(8) The report must include a clear and readily understandable explanation of each violation of the terms of a variance, exemption, administrative order, or judicial order and explain any adverse health effects and steps the system has taken to correct the violation.

(f) Variances and exemptions. If a system is operating under the terms of a variance or exemption issued under §290.102(b) of this title, the report must contain:

(1) an explanation of the variance or exemption;

(2) the date on which the variance or exemption was issued and on which it expires;

(3) a brief status report on the steps the system is taking, such as installing treatment processes or finding alternative sources of water, to comply with the terms and schedules of the variance or exemption; and

(4) a notice of any opportunity for public input as the review or renewal of the variance or exemption.

(g) Additional information.

(1) The report must contain a brief explanation regarding contaminants that may reasonably be expected to be found in drinking water (including bottled water). This explanation may include the language contained within subparagraphs (A) - (C) of this paragraph, or systems may include their own comparable language. The report must include the language of subparagraphs (D) and (E) of this paragraph.

(A) The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

(B) Contaminants that may be present in source water include:

(i) microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife;

(ii) inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

(iii) pesticides and herbicides, which might have a variety of sources such as agriculture, urban storm water runoff, and residential uses;

(iv) organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems; and

(v) radioactive contaminants, which can be naturally occurring or the result of oil and gas production and mining activities.

(C) In order to ensure that tap water is safe to drink, the EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

(D) Contaminants may be found in drinking water that may cause taste, color, or odor problems. These types of problems are not necessarily causes for health concerns. For more information on taste, odor, or color of drinking water, please contact the system's business office.

(E) Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at (800) 426-4791.

(2) The report must include the telephone number of the owner, operator, or designee of the community water system as an additional source of information concerning the report.

(3) Each English language report must include the following statement in a prominent place on the first page: "Este reporte incluye informacion importante sobre el agua para tomar. Para asistencia en español, favor de llamar al telefono (XXX) XXX-XXXX." In addition to this statement in Spanish, for communities with a large proportion of limited English proficiency residents, as determined by the executive director, the report must contain information in the appropriate language(s) regarding the importance of the report or contain a telephone number or address where such residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language.

(4) The report must include information about opportunities for public participation in decisions that may affect the quality of the water (e.g., time and place of regularly scheduled board meetings). Investor-owned utilities are encouraged to conduct public meetings, but must include a phone number for public input.

(5) The systems may include such additional information for public education consistent with, and not detracting from, the purposes of the report.

(6) Systems that use an interconnect or emergency source to augment the drinking water supply during the calendar year of the report must provide the source of the water, the length of time used, an explanation of why it was used, and whom to call for the water quality information.

(7) Beginning December 1, 2009, any groundwater system that receives notice from a laboratory of a fecal indicator positive [indicator-positive] groundwater source sample that is not invalidated by the executive director under §290.109(e) [§290.109(d)] of this title (relating to Microbial Contaminants) must inform its customers of any fecal indicator positive [indicator-positive] groundwater source sample in the next report. The system must continue to inform the public annually until the executive director determines that the fecal contamination in the groundwater source is addressed under §290.116(a) of this title (relating to Groundwater Corrective Actions and Treatment Techniques). Each report must include the following elements:

(A) the source of the fecal contamination (if the source is known) and the dates of the fecal indicator positive [indicator-positive] groundwater source samples;

(B) actions taken to address the fecal contamination in the groundwater source as directed by §290.116 of this title and the date of such action;

(C) for each fecal contamination in the groundwater source that has not been addressed under §290.116 of this title, the plan approved by the executive director and schedule for correction, including interim measures, progress to date, and any interim measures completed; and

(D) for a fecal indicator positive [indicator-positive] groundwater source sample that is not invalidated by the executive director under §290.109(e) [§290.109(d)] of this title, the potential health effects using the health effects language of §290.275(3) of this title.

(8) Beginning December 1, 2009, any groundwater system that receives notice from the executive director of a significant deficiency must inform its customers of any significant deficiency that is uncorrected at the time of the next report. The system must continue to inform the public annually until the executive director determines that particular significant deficiency is corrected under §290.116 of this title. Each report must include the following elements:

(A) the nature of the particular significant deficiency and the date the significant deficiency was identified by the executive director;

(B) for each significant deficiency, the plan approved by the executive director and schedule for correction, including interim measures, progress to date, and any interim measures completed; and

(C) if corrected before the next report, the nature of the significant deficiency, how the deficiency was corrected, and the date of the corrections.

(9) Any public water system required to comply with the Level 1 or Level 2 assessment requirements under §290.109 and §290.116 of this title that is not due to an *E. coli* MCL violation shall include in the following elements in the report as appropriate:

(A) Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(B) During the past year we were required to conduct {INSERT NUMBER OF LEVEL 1 ASSESSMENTS} Level 1 assessment(s). {INSERT NUMBER OF LEVEL 1 ASSESSMENTS} Level 1 assessment(s) were completed. In addition, we were required to take {INSERT NUMBER OF CORRECTIVE ACTIONS} corrective actions and we completed {INSERT NUMBER OF CORRECTIVE ACTIONS} of these actions.

(C) During the past year {INSERT NUMBER OF LEVEL 2 ASSESSMENTS} Level 2 assessments were required to be completed for our water system. {INSERT NUMBER OF LEVEL 2 ASSESSMENTS} Level 2 assessments were completed. In addition, we were required to take {INSERT NUMBER OF CORRECTIVE ACTIONS} corrective actions and we completed {INSERT NUMBER OF CORRECTIVE ACTIONS} of these actions.

(D) Any public water system that failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement and shall also include one or both of the following statements as appropriate:

(i) During the past year we failed to conduct all of the required assessment(s).

(ii) During the past year we failed to correct all identified defects that were found during the assessment.

(10) Any public water system required to comply with the Level 2 assessment requirements under §290.109 and §290.116 of this title that is due to an *E. coli* MCL violation shall include in the following elements in the report as appropriate:

(A) *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We found *E. coli* bacteria, indicating the need to look for potential problems in water treatment or distribution. When this occurs,

we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(B) We were required to complete a Level 2 assessment because we found *E. coli* in our water system. In addition, we were required to take {INSERT NUMBER OF CORRECTIVE ACTIONS} corrective actions and we completed {INSERT NUMBER OF CORRECTIVE ACTIONS} of these actions.

(C) Any public water system that has failed to complete the required assessment or correct all identified sanitary defects, is in violation of the treatment technique requirement and shall also include one or both of the following statements, as appropriate:

(i) We failed to conduct the required assessment.

(ii) We failed to correct all sanitary defects that were identified during the assessment that we conducted.

(11) If a public water system detects *E. coli* and has violated the *E. coli* MCL, in addition to completing the table as required in subsection (c)(4) of this section, the system shall include one or more of the following statements to describe any noncompliance, as applicable:

(A) We had an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

(B) We had a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

(C) We failed to take all required repeat samples following an *E. coli*-positive routine sample.

(D) We failed to test for *E. coli* when any repeat sample tests positive for total coliform.

(12) [(9)] Every report must include the following lead-specific information - a short informational statement about lead in drinking water and its effect on children.

(A) The statement must include the information set forth in this example statement. "If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. NAME OF UTILITY is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. If you are

concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at *http://www.epa.gov/safewater/lead.*"

(B) A public water system may write its own educational statement, but only in consultation with the executive director.

(h) If a public water system detects *E. coli* and has not violated the *E. coli MCL*, in addition to completing the table as required in subsection (c)(4) of this section, the system may include a statement that explains that although they have detected *E. coli*, they are not in violation of the *E. coli* MCL.

(i) [(h)] Customer notification of water loss by a retail public utility. A retail public utility required to file a water loss audit with the Texas Water Development Board under the provisions of Texas Water Code, §16.0121, shall notify its customers of its water loss reported in the water loss audit by including the water loss information on or with the next report following the filing of the water loss audit, unless the retail public utility elects to notify its customers of its water loss reported in the water loss audit by including the water loss information on or with the next bill sent to its customers following the filing of the water loss audit in accordance with §291.87 of this title (relating to Billing).

§290.275. Appendices A - D.

The following appendices are integral components of the subchapter.

(1) Appendix A--Converting Maximum Contaminant Level [MCL] Compliance Values for Consumer Confidence Reports (CCR).

Figure: 30 TAC §290.275(1)

[Figure: 30 TAC §290.275(1)

Appendix A - Converting Maximum Contaminant Level Compliance Values for Consumer Confidence Reports (CCR)				
Key				
AL	Action Level			
MCL	Maximum Contaminant Level			
MCLG	Maximum Contaminant Level Goal			
MFL	million fibers per liter			
mrem/year	millirems per year (a measure of radiation absorbed by the body)			
n/a	Not Applicable			
NTU	Nephelometric Turbidity Units			
pCi/L	picocuries per liter (a measure of radioactivity)			
ppm	parts per million, or milligrams per liter (mg/L)			
ppb	parts per billion, or micrograms per liter (µg/L)			
ppt	parts per trillion, or nanograms per liter			
ppq	parts per quadrillion, or picograms per liter			
TT	Treatment Technique			
Contaminant	**MCL in complianc**	**multiply by...**	**MCL in CCR units**	**MCLG in CCR units**

	e units (mg/L)			
Microbiological Contaminants				
1. Total Coliform Bacteria			For systems that collect 40 or more samples per month - Presence of coliform bacteria in more than 5% of monthly samples. For systems that collect fewer than 40 samples per month - Presence of coliform bacteria in more than 1 sample per month.	0
2. Fecal coliform and *E. coli*			A routine sample and a repeat sample are total coliform-positive [coliform positive], and one is also fecal coliform or *E. coli* positive. An uncorrected *E. coli*-positive sample at the	0

			raw groundwater source is a TT for the Ground Water Rule (GWR).	
3. Fecal indicators (enterococci or coliphage)			TT. An uncorrected fecal indicator positive [indicator-positive] sample at the raw groundwater source is a TT for the GWR.	n/a
4. Total organic carbon			TT (ppm)	n/a
5. Turbidity			TT (NTU)	n/a
Radioactive Contaminants				
6. Beta/photon emitters	4 mrem/yr		4 mrem/yr	0
7. Alpha emitters	15 pCi/L		15 pCi/L	0
8. Combined radium	5 pCi/L		5 pCi/L	0
9. Uranium	30 µg/L		30 µg/L	0
Inorganic Contaminants				
10. Antimony	.006	1000	6 ppb	6
11. Arsenic	.010	1000	10 ppb	n/a
12. Asbestos	7 MFL		7 MFL	7
13. Barium	2		2 ppm	2
14. Beryllium	.004	1000	4 ppb	4
15. Bromate	.010	1000	10 ppb	0
16. Cadmium	.005	1000	5 ppb	5
17. Chloramines	MRDL=4		MRDL=4 ppm	4
18. Chlorine	MRDL=4		MRDL=4 ppm	4

19. Chlorine Dioxide	MRDL=.8	1000	MRDL=800 ppb	800
20. Chlorite	1.0		1 ppm	0.8
21. Chromium	.1	1000	100 ppb	100
22. Copper	AL=1.3		AL=1.3 ppm	1.3
23. Cyanide	.2	1000	200 ppb	200
24. Fluoride	4		4 ppm	4
25. Lead	AL=.015	1000	AL=15 ppb	0
26. Mercury (inorganic)	.002	1000	2 ppb	2
27. Nitrate (as Nitrogen)	10		10 ppm	10
28. Nitrite (as Nitrogen)	1		1 ppm	1
29. Selenium	.05	1000	50 ppb	50
30. Thallium	.002	1000	2 ppb	0.5
Synthetic Organic Contaminants including Pesticides and Herbicides				
31. 2,4-D	.07	1000	70 ppb	70
32. 2,4,5-TP (Silvex)	.05	1000	50 ppb	50
33. Acrylamide			TT	0
34. Alachlor	.002	1000	2 ppb	0
35. Atrazine	.003	1000	3 ppb	3
36. Benzo(a)pyrene (PAH)	.0002	1,000,000	200 ppt	0
37. Carbofuran	.04	1000	40 ppb	40
38. Chlordane	.002	1000	2 ppb	0
39. Dalapon	.2	1000	200 ppb	200
40. Di(2-ethylhexyl) adipate	.4	1000	400 ppb	400
41. Di(2-ethylhexyl) phthalate	.006	1000	6 ppb	0
42. Dibromochloropropane	.0002	1,000,000	200 ppt	0
43. Dinoseb	.007	1000	7 ppb	7
44. Diquat	.02	1000	20 ppb	20
45. Dioxin (2,3,7,8-TCDD)	.00000003	1,000,000,000	30 ppq	0

46. Endothall	.1	1000	100 ppb	100
47. Endrin	.002	1000	2 ppb	2
48. Epichlorohydrin			TT	0
49. Ethylene dibromide	.00005	1,000,000	50 ppt	0
50. Glyphosate	.7	1000	700 ppb	700
51. Heptachlor	.0004	1,000,000	400 ppt	0
52. Heptachlor epoxide	.0002	1,000,000	200 ppt	0
53. Hexachlorobenzene	.001	1000	1 ppb	0
54. Hexachloro-cyclopentadiene	.05	1000	50 ppb	50
55. Lindane	.0002	1,000,000	200 ppt	200
56. Methoxychlor	.04	1000	40 ppb	40
57. Oxamyl (Vydate)	.2	1000	200 ppb	200
58. PCBs (Polychlorinated biphenyls)	.0005	1,000,000	500 ppt	0
59. Pentachlorophenol	.001	1000	1 ppb	0
60. Picloram	.5	1000	500 ppb	500
61. Simazine	.004	1000	4 ppb	4
62. Toxaphene	.003	1000	3 ppb	0
Volatile Organic Contaminants				
63. Benzene	.005	1000	5 ppb	0
64. Carbon tetrachloride	.005	1000	5 ppb	0
65. Chlorobenzene	.1	1000	100 ppb	100
66. o-Dichlorobenzene	.6	1000	600 ppb	600
67. p-Dichlorobenzene	.075	1000	75 ppb	75
68. 1,2-Dichloroethane	.005	1000	5 ppb	0
69. 1,1-Dichloroethylene	.007	1000	7 ppb	7
70. cis-1,2-Dichloroethylene	.07	1000	70 ppb	70
71. trans-1,2-Dichloroethylene	.1	1000	100 ppb	100
72. Dichloromethane	.005	1000	5 ppb	0
73. 1,2-Dichloropropane	.005	1000	5 ppb	0

74. Ethylbenzene	.7	1000	700 ppb	700
75. Haloacetic acids	0.060	1000	60 ppb	n/a
76. Styrene	.1	1000	100 ppb	100
77. Tetrachloroethylene	.005	1000	5 ppb	0
78. 1,2,4-Trichlorobenzene	.07	1000	70 ppb	70
79. 1,1,1-Trichloroethane	.2	1000	200 ppb	200
80. 1,1,2-Trichloroethane	.005	1000	5 ppb	3
81. Trichloroethylene	.005	1000	5 ppb	0
82. TTHMs (Total trihalomethanes)	.10	1000	100 ppb	n/a
83. Toluene	1		1 ppm	1
84. Vinyl Chloride	.002	1000	2 ppb	0
85. Xylenes	10		10 ppm	10

(2) Appendix B--Sources of Regulated Contaminants.

Figure: 30 TAC §290.275(2)

[Figure: 30 TAC §290.275(2)]

Appendix B - Sources of Regulated Contaminants	
Key	
AL	Action Level
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MFL	million fibers per liter
mrem/year	millirems per year (a measure of radiation absorbed by the body)
n/a	Not Applicable

NTU	Nephelometric Turbidity Units		
pCi/L	picocuries per liter (a measure of radioactivity)		
ppm	parts per million, or milligrams per liter (mg/L)		
ppb	parts per billion, or micrograms per liter (µg/L)		
ppt	parts per trillion, or nanograms per liter		
ppq	parts per quadrillion, or picograms per liter		
TT	Treatment Technique		
Contaminant (units)	**MCLG**	**MCL**	**Major sources in drinking water**
Microbiological Contaminants			
1. Total Coliform Bacteria	0	For systems that collect 40 or more samples per month - Presence of coliform bacteria in more than 5% of monthly samples. For systems that collect fewer than 40 samples per month - Presence of coliform bacteria in more than 1 sample per month.	Naturally present in the environment.
2. Fecal coliform and *E. coli*	0	A routine sample and a repeat sample are total coliform-positive [coliform positive], and one is also fecal coliform or *E. coli* positive. An uncorrected *E. coli*-positive sample at the raw groundwater source is a TT for the Ground Water Rule (GWR).	Human and animal fecal waste.
3. Fecal indicators (enterococci or coliphage)	n/a	TT. An uncorrected fecal indicator positive [indicator-positive] sample at the raw groundwater source is a TT for the GWR.	Human and animal fecal waste.

4. Total organic carbon (ppm)	n/a	TT	Naturally present in the environment.
5. Turbidity	n/a	TT	Soil runoff.
Radioactive Contaminants			
6. Beta/photon emitters (mrem/yr)	0	4	Decay of natural and man-made deposits.
7. Alpha emitters (pCi/L)	0	15	Erosion of natural deposits.
8. Combined radium (µg/L)	0	5	Erosion of natural deposits.
Inorganic Contaminants			
9. Uranium (µg/L)	0	30	Erosion of natural deposits.
10. Antimony (ppb)	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.
11. Arsenic (ppb)	n/a	10	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.
12. Asbestos (MFL)	7	7	Decay of asbestos cement water mains; Erosion of natural deposits.
13. Barium (ppm)	2	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
14. Beryllium (ppb)	4	4	Discharge from metal refineries and coal-burning

			factories; Discharge from electrical, aerospace, and defense industries.
15. Bromate (ppb)	0	10	By-product of drinking water disinfection.
16. Cadmium (ppb)	5	5	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; runoff from waste batteries and paints.
17. Chloramines (ppm)	MRDLG=4	MRDL=4	Water additive used to control microbes.
18. Chlorine (ppm)	MRDLG=4	MRDL=4	Water additive used to control microbes.
19. Chlorine Dioxide (ppb)	800	800	Water additive used to control microbes.
20. Chlorite (ppm)	1.0	1.0	By-product of drinking water disinfection.
21. Chromium (ppb)	100	100	Discharge from steel and pulp mills; Erosion of natural deposits.
22. Copper (ppm)	1.3	AL=1.3	Corrosion of household plumbing systems; Erosion of natural deposits.
23. Cyanide (ppb)	200	200	Discharge from steel/metal

			factories; Discharge from plastic and fertilizer factories.
24. Fluoride (ppm)	4	4	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories.
25. Lead (ppb)	0	AL=15	Corrosion of household plumbing systems; Erosion of natural deposits.
26. Mercury (inorganic) (ppb)	2	2	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland.
27. Nitrate (as Nitrogen) (ppm)	10	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
28. Nitrite (as Nitrogen) (ppm)	1	1	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
29. Selenium (ppb)	50	50	Discharge from petroleum and

			metal refineries; Erosion of natural deposits; Discharge from mines.
30. Thallium (ppb)	0.5	2	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories.
Synthetic Organic Contaminants including Pesticides and Herbicides			
31. 2,4-D (ppb)	70	70	Runoff from herbicide used on row crops.
32. 2,4,5-TP (Silvex) (ppb)	50	50	Residue of banned herbicide.
33. Acrylamide	0	TT	Added to water during sewage/wastewater treatment.
34. Alachlor (ppb)	0	2	Runoff from herbicide used on row crops.
35. Atrazine (ppb)	3	3	Runoff from herbicide used on row crops.
36. Benzo(a)pyrene (PAH) (nanograms/L)	0	200	Leaching from linings of water storage tanks and distribution lines.
37. Carbofuran (ppb)	40	40	Leaching of soil fumigant used on rice and alfalfa.
38. Chlordane (ppb)	0	2	Residue of banned termiticide.
39. Dalapon (ppb)	200	200	Runoff from herbicide used on rights of way.

40. Di(2-ethylhexyl) adipate (ppb)	400	400	Discharge from chemical factories.
41. Di(2-ethylhexyl)phthalate (ppb)	0	6	Discharge from rubber and chemical factories.
42. Dibromochloropropane (ppt)	0	200	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.
43. Dinoseb (ppb)	7	7	Runoff from herbicide used on soybeans and vegetables.
44. Diquat (ppb)	20	20	Runoff from herbicide use.
45. Dioxin (2,3,7,8-TCDD) (ppq)	0	30	Emissions from waste incineration and other combustion; Discharge from chemical factories.
46. Endothall (ppb)	100	100	Runoff from herbicide use.
47. Endrin (ppb)	2	2	Residue of banned insecticide.
48. Epichlorohydrin	0	TT	Discharge from industrial chemical factories; An impurity of some water treatment chemicals.
49. Ethylene dibromide (ppt)	0	50	Discharge from petroleum refineries.
50. Glyphosate (ppb)	700	700	Runoff from herbicide use.
51. Heptachlor (ppt)	0	400	Residue of banned termiticide.

52. Heptachlor epoxide (ppt)	0	200	Breakdown of heptachlor.
53. Hexachlorobenzene (ppb)	0	1	Discharge from metal refineries and agricultural chemical factories.
54. Hexachlorocyclopentadiene (ppb)	50	50	Discharge from chemical factories.
55. Lindane (ppt)	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens.
56. Methoxychlor (ppb)	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock.
57. Oxamyl (Vydate) (ppb)	200	200	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes.
58. PCBs (Polychlorinated biphenyls) (ppt)	0	500	Runoff from landfills; Discharge of waste chemicals.
59. Pentachlorophenol (ppb)	0	1	Discharge from wood preserving factories.
60. Picloram (ppb)	500	500	Herbicide runoff.
61. Simazine (ppb)	4	4	Herbicide runoff.
62. Toxaphene (ppb)	0	3	Runoff/leaching from insecticide used on cotton and cattle.
Volatile Organic Compounds			
63. Benzene (ppb)	0	5	Discharge from factories; Leaching

			from gas storage tanks and landfills.
64. Carbon tetrachloride (ppb)	0	5	Discharge from chemical plants and other industrial activities.
65. Chlorobenzene (ppb)	100	100	Discharge from chemical and agricultural chemical factories.
66. o-Dichlorobenzene (ppb)	600	600	Discharge from industrial chemical factories.
67. p-Dichlorobenzene (ppb)	75	75	Discharge from industrial chemical factories.
68. 1,2-Dichloroethane (ppb)	0	5	Discharge from industrial chemical factories.
69. 1,1-Dichloroethylene (ppb)	7	7	Discharge from industrial chemical factories.
70. cis-1,2-Dichloroethylene (ppb)	70	70	Discharge from industrial chemical factories.
71. trans-1,2-Dichloroethylene (ppb)	100	100	Discharge from industrial chemical factories.
72. Dichloromethane (ppb)	0	5	Discharge from pharmaceutical and chemical factories.
73. 1,2-Dichloropropane (ppb)	0	5	Discharge from industrial chemical factories.
74. Ethylbenzene (ppb)	700	700	Discharge from petroleum refineries.

75. Haloacetic acids (HAA) (ppb)	n/a	60	By-product of drinking water disinfection.
76. Styrene (ppb)	100	100	Discharge from rubber and plastic factories; Leaching from landfills.
77. Tetrachloroethylene (ppb)	0	5	Leaching from PVC pipes; Discharge from factories and dry cleaners.
78. 1,2,4-Trichlorobenzene (ppb)	70	70	Discharge from textile-finishing factories.
79. 1,1,1-Trichloroethane (ppb)	200	200	Discharge from metal degreasing sites and other factories.
80. 1,1,2-Trichloroethane (ppb)	3	5	Discharge from industrial chemical factories.
81. Trichloroethylene (ppb)	0	5	Discharge from metal degreasing sites and other factories.
82. TTHMs (Total trihalomethanes) (ppb)	n/a	80	By-product of drinking water disinfection.
83. Toluene (ppm)	1	1	Discharge from petroleum factories.
84. Vinyl Chloride (ppb)	0	2	Leaching from PVC piping; Discharge from plastics factories.
85. Xylenes (ppm)	10	10	Discharge from petroleum factories; Discharge from chemical factories.

(3) Appendix C--Health Effects Language.

Figure: 30 TAC §290.275(3)

[Figure: 30 TAC §290.275(3)]

Appendix C--Health Effects Language

Microbiological Contaminants

(1) Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(2) *Escherichia* (*E. coli)* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely-compromised immune systems.

[(1) Total coliform. Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.]

[(2) Fecal coliform/*E.coli*. Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.]

(3) Fecal indicators (enterococci or coliphage). Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

(4) Total organic carbon. Total organic carbon (TOC) has no health effects [affects]. However, TOC provides a medium for the formation of disinfection by-products. These by-products include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these by-products in excess of the maximum contaminant level (MCL) may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.

(5) Turbidity. Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Radioactive Contaminants

(6) Beta/photon emitters. Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.

(7) Alpha emitters. Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.

(8) Combined Radium 226/228. Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.

(9) Uranium. Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.

Inorganic Contaminants

(10) Antimony. Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.

(11) Arsenic. Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

(12) Asbestos. Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.

(13) Barium. Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.

(14) Beryllium. Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.

(15) Bromate. Some people who drink water containing bromate in excess of the MCL over many years could experience an increased risk of getting cancer.

(16) Cadmium. Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.

(17) Chloramines. Some people who use water containing chloramines well in excess of the maximum residual disinfectant level (MRDL) could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the [maximum residual disinfectant level (]MRDL[)] could experience stomach discomfort or anemia.

(18) Chlorine. Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

(19) Chlorine dioxide. Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.

(20) Chlorite. Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.

(21) Chromium. Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.

(22) Copper. Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

(23) Cyanide. Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.

(24) Fluoride. Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.

(25) Lead. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

(26) Mercury (inorganic). Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.

(27) Nitrate. Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

(28) Nitrite. Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

(29) Selenium. Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.

(30) Thallium. Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.

Synthetic Organic Contaminants Including Pesticides and Herbicides

(31) 2,4-D. Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.

(32) 2,4,5-TP (Silvex). Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.

(33) Acrylamide. Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.

(34) Alachlor. Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.

(35) Atrazine. Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.

(36) Benzo(a)pyrene (PAH). Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.

(37) Carbofuran. Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.

(38) Chlordane. Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.

(39) Dalapon. Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.

(40) Di (2-ethylhexyl) adipate. Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects such as weight loss, liver enlargement, or possible reproductive difficulties.

(41) Di (2-ethylhexyl) phthalate. Some people who drink water containing di (2-ethylhexyl) phthalate in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.

(42) Dibromochloropropane (DBCP). Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.

(43) Dinoseb. Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.

(44) Dioxin (2,3,7,8-TCDD). Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.

(45) Diquat. Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.

(46) Endothall. Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.

(47) Endrin. Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.

(48) Epichlorohydrin. Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.

(49) Ethylene dibromide. Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.

(50) Glyphosate. Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.

(51) Heptachlor. Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.

(52) Heptachlor epoxide. Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.

(53) Hexachlorobenzene. Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.

(54) Hexachlorocyclopentadiene. Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.

(55) Lindane. Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.

(56) Methoxychlor. Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.

(57) Oxamyl. Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.

(58) PCBs (polychlorinated byphenols). Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.

(59) Pentachlorophenol. Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.

(60) Picloram. Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.

(61) Simazine. Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.

(62) Toxaphene. Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.

Volatile Organic Contaminants

(63) Benzene. Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.

(64) Carbon Tetrachloride. Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

(65) Chlorobenzene. Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.

(66) o-Dichlorobenzene. Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.

(67) p-Dichlorobenzene. Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.

(68) 1,2-Dichloroethane. Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.

(69) 1,1-Dichloroethylene. Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

(70) cis-1,2-Dichloroethylene. Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

(71) trans-1,2-Dicholoroethylene. Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.

(72) Dichloromethane. Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.

(73) 1,2-Dichloropropane. Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.

(74) Ethylbenzene. Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.

(75) Haloacetic acids (HAAs). Some people who drink water containing HAAs in excess of the MCL over many years may have an increased risk of getting cancer.

(76) Styrene. Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.

(77) Tetrachloroethylene. Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.

(78) 1,2,4-Trichlorobenzene. Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.

(79) 1,1,1,-Trichloroethane. Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.

(80) 1,1,2-Trichloroethane. Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.

(81) Trichloroethylene. Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

(82) TTHMs (Total Trihalomethanes). Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

(83) Toluene. Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.

(84) Vinyl Chloride. Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.

(85) Xylenes. Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

(4) Appendix D--Unregulated Contaminants.

Figure: 30 TAC §290.275(4) (No change to the figure as it currently exists in TAC.)

Appendix D-Unregulated Contaminants

(1) Chloroform
(2) Bromodichloromethane
(3) Chlorodibromomethane
(4) Bromoform
(5) Dibromomethane
(6) m-Dichlorobenzene
(7) [Reserved]
(8) 1,1-Dichloropropene
(9) 1,1-Dichloroethane
(10) 1,1,2,2-Tetrachloroethane
(11) 1,3-Dichloropropane
(12) Chloromethane
(13) Bromomethane
(14) 1,2,3-Trichloropropane
(15) 1,1,1,2-Tetrachloroethane
(16) Chloroethane
(17) 2,2-Dichloropropane
(18) o-Chlorotoluene
(19) p-Chlorotoluene
(20) Bromobenzene
(21) 1,3-Dichloropropene