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Standards and Reporting Requirements for Public Water Systems

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Water Supply Division

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Standards and Reporting Requirements for Public Water Systems

Prepared by
Water Supply Division

RG-346
Revised December 2019

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Preface

This publication contains the language of Title 30, Texas Administrative Code, Chapter 290 (30 TAC 290), Subchapter E: Public Health Service (PHS) Fees, Subchapter F: Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Supply Systems, and Subchapter H: Consumer Confidence Reports.

- Subchapter E covers the fees that public water systems (PWSs) must pay to the state.
- Subchapter F covers the requirements regarding drinking water quality at PWSs.
- Subchapter H covers the requirements for community PWSs to deliver an annual report of drinking water quality, called a Consumer Confidence Report (CCR), to their customers.

It contains the rule language for these three subchapters and is formatted to allow easy reference to individual rule elements.

What useful features are in this publication?

We have included the following features to help you use this document and hope you will find them to be useful:

- **A table of commonly used abbreviations** will help you understand which term in these rules corresponds to an abbreviation you encounter in a related publication.
- **The topics and section numbers at the top of each page** will help you find information quickly. For example, to find the specific rules for water treatment, look for "Water Treatment" at the top of the page. To find out what 30 TAC §290.104(c)(2) says, look for "§290.104," which is just below the corresponding topic.
- **The full citation for each part of the rule** to avoid confusion. For example, you'll see "§290.106(c)(2)(A)" instead of just that final letter "(A)."

Why these revisions?

This guidance document incorporates the most current rule language of 30 TAC 290 Subchapter E, F and H as of January 2019, as well as the following changes.

The 2015 through 2019 revisions to these rules:

- Addresses the updates for the EPA revised total coliform rule and groundwater rule (effective March 30, 2017).
- Makes minor changes to §290.117 for water quality parameters samples to be collected (effective March 30, 2017).
- Includes updates to the Fee structure (effective June 2, 2016).

We have links to the Texas Secretary of State's official version of these rules on our website at <www.tceq.texas.gov/goto/rules/> and they were also published in the Texas Register on March 30, 2017.

This document reproduces the text of the rule as published on the Secretary of State's (SOS) website. If there appears to be a discrepancy between this guide and the rules, follow the rules on the SOS website.

What other rules apply to public water systems in Texas?

Public water systems should be aware of all the rules pertaining to drinking water that are contained in various parts of the Texas regulations. A public water system must comply with all the applicable requirements. Each rule explains exactly which public water system it applies to. Some examples of additional rules and their locations within the regulations are given below:

- **30 TAC 290 Subchapter D.** Rules and regulations for public water systems related to requirements for water treatment plant design, operation and maintenance. If you have questions about Subchapter D contact the Texas Commission on Environmental Quality's (TCEQ) public drinking water program at 512-239-4691 or by e-mail at <pdws@tceq.texas.gov>.
- **30 TAC Chapter 291.** Rules and regulations for public water systems related to capacity development. Contact the Plan Review Team at 512-239-4691 or by e-mail at <plandist@tceq.texas.gov> if you have questions about these requirements.
- **30 TAC Chapter 293.** Rules and regulations for water districts. Contact the Water Districts Section at 512-239-4691 or by e-mail at <plandist@tceq.texas.gov> if you have questions about these requirements.
- **30 TAC Chapter 30.** Requirements for certification of water works operators. TCEQ's Operator Certification Team can answer questions about these requirements at 512-239-6133.
- **16 TAC Part 4, Chapter 76.** Rules and regulations for water well drillers. If you have questions about these regulations, call 1-800-803-9202 or 512-463-8876 or go to the Texas Department of Licensing and Regulation (TDLR) Web site at <www.license.state.tx.us/wwd/wwd.htm>.
- **16 TAC Part 2, Chapter 24.** Rules and regulations for water utilities related to requirements for rates and Certificates of Convenience and Necessity for utilities. Contact the Public Utility Commission at 512-936-7405 or by e-mail at <water@puc.texas.gov> if you have questions about these requirements.

The Department of State Health Services (DSHS) implements the Food and Drug Administration (FDA) and Texas regulations for water bottlers, water vendors, restaurants, day cares, hospitals and other entities that may own or operate public water systems. The TCEQ highly recommends that business owners and operators review the DSHS rules to determine if those rules apply to them.

Who can answer questions about these rules?

If you have questions about the rules described in this guidance document, contact the Texas Commission on Environmental Quality (TCEQ) Water Supply Division at 512-239-4691 or by e-mail at <pdws@tceq.texas.gov>.

Who enforces these rules?

The State of Texas has primacy over the regulation of public drinking water. This means that the TCEQ writes, adopts, and enforces rules that are at least as stringent as the rules promulgated by the U.S. Environmental Protection Agency (EPA). The Texas rules may be more specific than or worded differently from the EPA rules, so public water systems should become familiar with the Texas-specific rules.

How can I get copies of TCEQ rules, forms, and publications?

Here are ways you can obtain copies of rules, forms, or publications from the TCEQ:

- E-mail your order to the Publications Section at <puborder@tceq.texas.gov>. Be sure to provide your name, address, and the title and number of the publication you are requesting.
- Go to the TCEQ website at <www.tceq.texas.gov>; under the Site Navigation bar, follow the links to “Rules,” “Forms,” or “Publications” to download copies.
- Fax your order to 512-239-4488, or order by phone at 512-239-0028.
- Write to TCEQ Publications, MC 195; PO Box 13087; Austin, TX 78711-3087.

If you don’t find the item you want, the TCEQ Publications Unit will help you find it. Contact them as shown above or by calling 512-239-0028. Try to give the rule, form, or publication number as well as the title. This information will help the TCEQ get the correct item to you as quickly as possible.

Abbreviations and Acronyms

AWWA American Water Works Association

BDL below detection limit. If a contaminant is measured in a concentration lower than that at which a given method can be accurately used, it is considered BDL. Often, a BDL reading is reported as zero. See MDL.

BF baffling factor. The BF is used to account for potential short circuiting when determining the effective contact time for calculating CT.

CCI Comprehensive Compliance Investigation. A sanitary survey performed by TCEQ regional staff.

CCN Certificate of Convenience and Necessity

CCR Consumer Confidence Report. The report of drinking water quality that every community public water system is required to send to their customers every year.

CFR Code of Federal Regulations

CT concentration time (the product of disinfectant concentration and effective contact time [T10]). This value describes the effectiveness of a given level of disinfectant in a given unit process.

CWS community water system

DBP disinfection byproduct. An undesirable byproduct of beneficial disinfection.

DBPP disinfection byproduct precursor. Molecules present in natural water that will tend to form disinfection byproducts when the water is disinfected. The EPA is using total organic carbon (TOC) and specific ultraviolet absorbance (SUVA) as surrogates for DBPP.

DBP1 Stage 1 Disinfectants and Disinfection Byproducts Rule

DBP2 Stage 2 Disinfectants and Disinfection Byproducts Rule

DOC dissolved organic carbon. This group parameter measures the total amount of carbon present in organic molecules dissolved in the water. Basically, it is done on the same machine as total organic carbon (TOC), but the sample is filtered before analysis.

DWW Drinking Water Watch. The EPA's Web-based library of all data for public water systems. Texas data is available at <dww2.tceq.state.tx.us/DWW/> and national data is available at <www.epa.gov/enviro/html/sdwis/sdwis_query.html>

EPA Environmental Protection Agency

GUI groundwater under the direct influence of surface water. For regulatory purposes, GUI is subject to the same requirements as surface water.

GWR Ground Water Rule. The GWR, requiring raw water sampling, corrective action in response to detection of viral indicators, and notification of significant deficiencies, will became effective Dec. 1, 2009.

HAA haloacetic acid (a DBP). There are nine different HAAs that contain bromine, chlorine, or both, although only five of these are currently regulated.

HAA5 a specific group of five haloacetic acids. DBP1 and DBP2 set a maximum contaminant level (MCL) for the sum of the following five HAAs: monochloroacetic acid (MCAA), dichloroacetic acid (DCAA), trichloroacetic acid (TCAA), monobromoacetic acid (MBAA), and dibromoacetic acid (DBAA).

HAAFP haloacetic acid formation potential. The theoretical maximum amount of HAA a given source of water can form.

HDT hydraulic detention time

IESWTR Interim Enhanced Surface Water Treatment Rule

IDSE Initial Distribution System Evaluation

LT1 Long Term 1 Enhanced Surface Water Treatment Rule

LT2 Long Term 2 Enhanced Surface Water Treatment Rule

MCL maximum contaminant level. The concentration level of a contaminant that is regulated. If a system has a contaminant concentration greater than the MCL, they may be in violation of the regulations. See RAA.

MCLG maximum contaminant level goal. The health-effects based ideal level for a contaminant. This is not the regulated concentration.

MDL method detection limit. The concentration below which a given method cannot accurately measure concentration. See BDL.

MOR monthly operating report

MRDL maximum residual disinfectant limit. EPA regulations establish these limits on the allowable concentration of disinfectant leaving a plant.

MRDLG maximum residual disinfectant limit goal

NTNC non-transient, non-community water system. A water system that serves the same people all year, but is not a community. A school or factory may be a NTNC.

NTU Nephelometric turbidity unit. A measurement of the cloudiness of water. Turbidity monitoring is required at all surface water and GUI treatment plants.

PWS public water system

PWSID public water system identification number

RAA running annual average

SDWA Safe Drinking Water Act

SDWIS Safe Drinking Water Information System. The database of record for EPA drinking water quality data, also known as SWRL, for "SDWIS-Web Release." The online form of this data is known as Drinking Water Watch. Texas data is available at <https://dww2.tceq.texas.gov/DWW/> and national data is available at <www.epa.gov/enviro/html/sdwis/sdwis_query.html>.

SCL secondary contaminant level

SOC synthetic organic chemical

SUVA specific ultraviolet absorbance

SW surface water

SWTP surface water treatment plant

SWTR Surface Water Treatment Rule

T detention time (see HDT) or temperature

T10 effective contact time. The time within which 10 percent of a tracer material will have passed through a unit process. Theoretical T10 can be calculated by multiplying the baffling factor (BF) by the theoretical hydraulic detention time (HDT).

TCEQ Texas Commission on Environmental Quality, previously known as the Texas Natural Resource Conservation Commission before Sept. 1, 2002.

TEEX Texas Engineering Extension Service

THM trihalomethane (a DBP). These are halogenated organic molecules with one carbon, three halogens, and one hydrogen. The four THMs of interest are chloroform (three chlorines, also called "trichloromethane"), dichlorobromomethane, dibromochloromethane, and bromoform (a molecule containing three bromines; also called "tribromomethane").

TNC Transient non-community water system

TNRCC Texas Natural Resource Conservation Commission, which became the Texas Commission on Environmental Quality (TCEQ) on Sept. 1, 2002.

TOC total organic carbon. A group parameter measuring the total amount of carbon in water present as organic molecules. The EPA is using TOC as a surrogate for DBPPs in the DBP1. See DOC.

TTHM total trihalomethanes. The sum of the four THMs upon which compliance is based.

TWDB Texas Water Development Board

TWUA Texas Water Utilities Association

UV ultraviolet

UV254 absorbance of ultraviolet light at a wavelength of 254 nanometers, measured in units of inverse length

VOC volatile organic chemical, volatile organic contaminant, or volatile organic compound

Title 30 Environmental Quality
Part 1 Texas Commission on Environmental Quality
Chapter 290 Public Drinking Water

Subchapter E: Fees for Public Water Systems

§290.51 Fees for Services to Drinking Water System

§290.51(a) Purpose and scope.

§290.51(a)(1) The purpose of this section is to establish fees for services provided by the commission to public water systems.

§290.51(a)(2) The commission will provide services to public water systems, as follows:

§290.51(a)(2)(A) scheduling of analysis of drinking water for chemical content;

§290.51(a)(2)(B) collection of samples of drinking water for chemical analyses;

§290.51(a)(2)(C) review system data for evaluation of sampling waivers;

§290.51(a)(2)(D) inspect public water systems;

§290.51(a)(2)(E) review plans for new systems and major improvements to existing systems; and

§290.51(a)(2)(F) provide technical assistance as needed.

§290.51(a)(3) The fees which the commission will charge for services provided to community and nontransient noncommunity water systems under this subsection will be according to the following schedule.

§290.51(a)(3)(A) For a system with fewer than 25 connections, the fee will be an amount up to a maximum of $200.

§290.51(a)(3)(B) For systems with 25 - 160 connections, the fee will be an amount up to a maximum of $300.

§290.51(a)(3)(C) For a system with greater than or equal to 161 connections, the fee will be an amount up to a maximum of $4.00 per connection.

§290.51(a)(3)(C)(i) The number of connections will be determined from data collected from the latest agency inspection report.

§290.51(a)(3)(C)(ii) All nontransient noncommunity systems, state, federal, and other community water system installations determined by the commission to serve large populations through a few connections will have the number of connections for fee purposes determined by dividing the population served by a value of ten.

§290.51(a)(3)(C)(iii) Examples of such installations include, but are not limited to, universities, children's homes, correctional facilities, and military facilities which generally do not bill customers for water service.

§290.51(a)(4) New public water systems will not be assessed a fee for services until water is supplied to the first connection.

§290.51(a)(5) The commission will charge a fee of $100 for services provided to noncommunity water systems which are not addressed in paragraph (3) of this subsection.

§290.51(a)(6) All fees are due by January 1 of each year, shall be paid by check, money order, electronic funds transfer, or through the agency's payment portal, and shall be made payable to the Texas Commission on Environmental Quality. Penalties and interest for the late payment of fees shall be assessed in accordance with Chapter 12 of this title (relating to Payment of Fees).

§290.51(b) Failure to make payments as required under this section will subject the violator to the penalty provisions of the Texas Health and Safety Code, Chapter 341, Subchapter C.

§290.51(c) The commission may adjust the fee rates in subsection (a) of this section through an appropriate notification process, such as, but not limited to, *Texas Register* publication, based on the agency's cost of administering the water programs.

Source Note: *The provisions of this §290.51 adopted to be effective December 21, 1993, 18 TexReg 9105; amended to be effective February 14, 1997, 22 TexReg 1323; amended to be effective December 30, 2001, 26 TexReg 10616; amended to be effective July 30, 2009, 34 TexReg 4893; amended to be effective June 2, 2016, 41 TexReg 3906*

Subchapter F: Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems

§290.101. Purpose

The purpose of these standards is to assure the safety of public water supplies with respect to microbiological, chemical and radiological quality and to further efficient processing through control tests, laboratory checks, operating records and reports of public water supply systems. These standards are written to comply with the requirements of the Federal "Safe Drinking Water Act," 42 USC §300f et seq., and the "Primary Drinking Water Regulations" which have been promulgated by the United States Environmental Protection Agency.

Source Note: *The provisions of this §290.101 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective January 9, 2008, 33 TexReg 198*

§290.102. General Applicability

§290.102(a) General applicability. This subchapter shall apply to all public water systems as described in each section, unless the system:

§290.102(a)(1) consists only of distribution and storage facilities (and does not have any production and treatment facilities);

§290.102(a)(2) obtains all of its water from, but is not owned or operated by, a public water system to which such standards apply;

§290.102(a)(3) does not sell water to any person;

§290.102(a)(4) is not a carrier which conveys passengers in interstate commerce; and

§290.102(a)(5) is subject to plumbing restrictions and inspections by the public water system which provides the water.

§290.102(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 §§142.301 - 142.313. The executive director may not approve variances or exemptions from:

§290.102(b)(1) the maximum contaminant level (MCL) for *Escherichia coli*, nitrate, nitrite, or total nitrate and nitrite;

§290.102(b)(2) the maximum residual disinfection level for chlorine dioxide; or

§290.102(b)(3) the treatment technique requirements for filtration and disinfection.

§290.102(b)(4) Variances are prohibited for rules addressing microbial contaminants, including rules in §290.109 - 209.111 and §290.116 of this title (relating to Microbial Contaminants; Disinfectant Residuals; Surface Water Treatment; and Groundwater Corrective Actions and Treatment Techniques).

§290.102(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).

§290.102(c)(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:

§290.102(c)(1)(A) there are no acute violations associated with the new MCL or treatment technique for which the extension is being granted;

§290.102(c)(1)(B) the executive director determines that granting the extension will not result in an unreasonable risk to public health;

§290.102(c)(1)(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);

§290.102(c)(1)(D) the executive director determines that capital improvements are needed to comply with the new MCL or treatment technique;

§290.102(c)(1)(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

§290.102(c)(1)(F) the EPA has not already incorporated a two-year extension into the effective date for the new MCL or treatment technique requirement.

§290.102(c)(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.

§290.102(c)(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.

§290.102(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).

§290.102(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.

§290.102(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.

§290.102(g) The owner or operator of a public water system shall ensure that the executive director is provided 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.

Source Note: *The provisions of this §290.102 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective March 30, 2017, 42 TexReg 1466*

§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.

§290.103(1) Assessment source monitoring--Raw groundwater source monitoring required by the executive director based on groundwater source susceptibility to fecal contaminants.

§290.103(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.

> **§290.103(2)(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.
>
> **§290.103(2)(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).
>
> > **§290.103(2)(B)(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.
> >
> > **§290.103(2)(B)(ii)** For the purposes of DBP2, the CDS shall be determined based on the retail population served within each individual system's distribution system.

§290.103(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.

§290.103(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.

§290.103(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.

§290.103(6) Consecutive system--A public water system that receives some or all of its finished water from one or more other public water systems.

§290.103(7) Disinfection profile--A summary of daily *Cryptosporidium*, *Giardia lamblia* and viral inactivation obtained through disinfection at the treatment plant.

§290.103(8) Disinfection by-products (DBP)--Chemical compounds formed by the reaction of a disinfectant with the natural organic matter present in water.

§290.103(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.

§290.103(10) 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.

§290.103(11) 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.

§290.103(12) Enhanced coagulation--The removal of disinfection by-product precursors to a specified level by conventional coagulation and sedimentation.

§290.103(13) Enhanced softening--The removal of disinfection by-product precursors to a specified level by softening.

§290.103(14) 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.

§290.103(15) Entry point sampling site--A sampling site representing the quality of the water entering the distribution system at each designated entry point.

§290.103(16) Fecal indicators--Microbiological organisms used to indicate the presence of fecal contamination. Examples include; fecal coliform, *Escherichia coli (E. coli)*, enterococci, and coliphage.

§290.103(17) 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.

§290.103(18) 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.

§290.103(19) 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).

§290.103(20) Groundwater corrective action--Action required when a raw groundwater source sample is found to be positive for *Escherichia coli (E. coli)* or other fecal indicators as described under §290.116(b) of this title (relating to Groundwater Corrective Actions and Treatment Techniques).

§290.103(21) 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.

§290.103(22) 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.

§290.103(23) 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.

§290.103(24) Halogen--One of the chemical elements chlorine, bromine, or iodine.

§290.103(25) Hydrogeologic sensitivity assessment--A determination of whether groundwater systems obtain water from hydrogeologically sensitive sources.

§290.103(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.

§290.103(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.

§290.103(28) Locational running annual average (LRAA)--The average of analytical results for samples taken at a specific monitoring location during the previous four calendar quarters.

§290.103(29) 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 for regulated contaminants are defined in the applicable sections of this subchapter.

§290.103(30) 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.

§290.103(31) Minimum acceptable disinfectant residual--The lowest disinfectant concentration allowed in the distribution system for microbial control.

§290.103(32) 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.

§290.103(33) Raw water--Water prior to any treatment including disinfection that is intended to be used, after treatment, as drinking water.

§290.103(33)(A) Raw groundwater is water from a groundwater source.

§290.103(33)(B) Raw surface water is any water from a surface water source or from a groundwater under the direct influence of surface water source.

§290.103(34) Raw groundwater source monitoring--Fecal indicator sampling at untreated groundwater sources including triggered source water and assessment source monitoring.

§290.103(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.

§290.103(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.

§290.103(37) 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.

§290.103(38) 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).

§290.103(39) 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.

§290.103(40) Total trihalomethanes (TTHM)--The sum of the chloroform, dibromochloromethane, bromodichloromethane, and bromoform concentrations in milligrams per liter, rounded to two significant figures after summing.

§290.103(41) 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.

§290.103(42) 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.

§290.103(43) Wholesale system--A public water system that delivers water to another public water system.

§290.103(44) 4-log treatment--At least 99.99% (4-log) treatment of viruses using inactivation, removal, or an 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.

***Source Note**: The provisions of this §290.103 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective November 8, 2012, 37 TexReg 8849; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.104. Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels

§290.104(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.

§290.104(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).

Table 1: §290.104(b) MCLs for Inorganic Contaminants

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 & Nitrite (Total)	10 (as Nitrogen)
Selenium	0.05
Thallium	0.002

§290.104(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).

Table 2: §290.104(c)(1) MCLs for Synthetic Organic Contaminants

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

§290.104(c)(2) The following are the MCLs for volatile organic contaminants.

Table 3: §290.104(c)(2) MCLs for Volatile Organic Contaminants

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

§290.104(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).

§290.104(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)*.

§290.104(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).

§290.104(f)(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.

§290.104(f)(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.

§290.104(f)(3) The MRDL of chlorine dioxide in the water entering the distribution system is 0.8 mg/L.

§290.104(f)(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.

§290.104(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).

§290.104(g)(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.

§290.104(g)(2) Systems are subject to the raw water monitoring, pathogen removal and inactivation and individual filter turbidity provisions of §290.111 of this title.

§290.104(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)).

§290.104(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:

§290.104(i)(1) 0.080 mg/L for TTHM; and

§290.104(i)(2) 0.060 mg/L for HAA5.

§290.104(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:

§290.104(j)(1) 1.0 mg/L for chlorite; and

§290.104(j)(2) 0.010 mg/L for bromate.

§290.104(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:

§290.104(k)(1) 0.015 mg/L for lead; and

§290.104(k)(2) 1.3 mg/L for copper.

§290.104(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).

Source Note: *The provisions of this §290.104 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective February 19, 2004, 29 TexReg 1373; amended to be effective December 23, 2004, 29 TexReg 11729; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.105. Summary of Secondary Standards

§290.105(a) Summary table purpose. The secondary constituent levels are presented in this section as a reference source. Only the regulatory concentration is shown in these tables. Compliance requirements are given in §290.118 of this title (relating to Secondary Standards).

§290.105(b) Secondary standards. The secondary standards apply to all public water systems as provided in §290.118 of this title (relating to Secondary Constituent Levels). The maximum levels for secondary constituents are listed in the following table:

Table 4: §290.105(b) Secondary Standards

Contaminant	**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

Source Note: *The provisions of this §290.105 adopted to be effective September 13, 2000, 25 TexReg 8880*

§290.106. Inorganic Contaminants

§290.106(a) Applicability. All public water systems are subject to the requirements of this section.

§290.106(a)(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.

§290.106(a)(2) Transient, noncommunity systems shall comply with the requirements of this section regarding monitoring, reporting, and MCL for nitrate and nitrite.

§290.106(a)(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.

§290.106(b) MCLs 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.

Table 5: §290.106(b) MCLs for Inorganic Contaminants

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 & Nitrite (Total)	10 (as Nitrogen)
Selenium	0.05
Thallium	0.002

§290.106(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.

§290.106(c)(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.

§290.106(c)(1)(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.

§290.106(c)(1)(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.

§290.106(c)(1)(C) The executive director may approve the use of composite samples.

§290.106(c)(1)(C)(i) Compositing must be done in the laboratory or in the field by persons designated by the executive director.

§290.106(c)(1)(C)(ii) Compositing shall be allowed only at groundwater entry points to the distribution system.

§290.106(c)(1)(C)(iii) Compositing shall be allowed only within a single system. Samples from different systems shall not be included in a composite sample.

§290.106(c)(1)(C)(iv) No more than five individual samples shall be included in a composite sample.

§290.106(c)(1)(C)(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).

§290.106(c)(1)(C)(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.

§290.106(c)(1)(C)(vi)(I) Follow-up samples must be collected within 14 days of receipt of the composite sample results.

§290.106(c)(1)(C)(vi)(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.

§290.106(c)(1)(C)(vi)(III) The follow-up or duplicate samples must be analyzed for the contaminant(s) which were excessive in the composite sample.

§290.106(c)(1)(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.

§290.106(c)(2) Monitoring locations for asbestos. Asbestos shall be monitored at locations where asbestos contamination is most likely to occur.

§290.106(c)(2)(A) A system vulnerable to asbestos contamination due solely to source water shall sample at the entry point to the distribution system.

§290.106(c)(2)(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.

§290.106(c)(2)(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.

§290.106(c)(2)(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.

§290.106(c)(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 and nitrite (total), mercury, selenium, and thallium.

§290.106(c)(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.

§290.106(c)(4)(A) Routine monitoring frequency. A public water system shall routinely monitor for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium.

§290.106(c)(4)(A)(i) Each groundwater entry point shall be sampled once every three years.

§290.106(c)(4)(A)(ii) Each surface water entry point shall be sampled annually.

§290.106(c)(4)(A)(iii) Each of the sampling frequencies listed in this paragraph constitutes one round of sampling for groundwater and surface water entry points, respectively.

§290.106(c)(4)(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.

§290.106(c)(4)(B)(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.

§290.106(c)(4)(B)(ii) To be considered for a waiver, systems shall demonstrate that all previous analytical results at that sample site were less than the MCL.

§290.106(c)(4)(B)(iii) In determining the appropriate reduced monitoring frequency, the executive director shall consider:

§290.106(c)(4)(B)(iii)(I) the reported contaminant concentrations from all previous samples;

§290.106(c)(4)(B)(iii)(II) the degree of variation in reported concentrations; and

§290.106(c)(4)(B)(iii)(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.

§290.106(c)(4)(B)(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.

§290.106(c)(4)(B)(v) The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

§290.106(c)(4)(B)(vi) A system must take a minimum of one sample during each compliance cycle while the waiver is effective.

§290.106(c)(4)(C) Increased monitoring. The executive director may increase the monitoring frequency for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium.

§290.106(c)(4)(C)(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.

§290.106(c)(4)(C)(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.

§290.106(c)(4)(C)(ii)(I) The executive director shall not decrease the quarterly sampling requirement until a groundwater system has taken a minimum of two quarterly samples.

§290.106(c)(4)(C)(ii)(II) The executive director shall not decrease the quarterly sampling requirement until a surface water system has taken a minimum of four quarterly samples.

§290.106(c)(5) Asbestos monitoring frequency. Community and nontransient, noncommunity water systems shall monitor for asbestos at the following frequency.

§290.106(c)(5)(A) A public water system shall routinely monitor for asbestos once during the first three years of each compliance cycle.

§290.106(c)(5)(B) The executive director may waive the routine monitoring frequency requirements for asbestos.

§290.106(c)(5)(B)(i) When determining if a waiver should be granted, the executive director shall consider:

§290.106(c)(5)(B)(i)(I) the potential for asbestos contamination of the water source;

§290.106(c)(5)(B)(i)(II) the use of asbestos-cement pipe for finished water distribution; and

§290.106(c)(5)(B)(i)(III) the corrosivity of the water.

§290.106(c)(5)(B)(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.

§290.106(c)(5)(B)(iii) The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

§290.106(c)(5)(C) The executive director may increase the monitoring frequency for asbestos.

§290.106(c)(5)(C)(i) A system that exceeds the MCL for asbestos shall sample quarterly beginning in the next quarter after the violation occurs.

§290.106(c)(5)(C)(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.

§290.106(c)(5)(C)(ii)(I) The executive director shall not decrease the quarterly sampling requirement until a groundwater system has taken a minimum of two quarterly samples.

§290.106(c)(5)(C)(ii)(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.

§290.106(c)(6) Nitrate monitoring frequency. All public water systems shall monitor for nitrate at the following frequency.

§290.106(c)(6)(A) Routine nitrate monitoring frequency. All public water systems shall routinely monitor for nitrate.

§290.106(c)(6)(A)(i) All public water systems shall annually sample at each groundwater entry point to the distribution system.

§290.106(c)(6)(A)(ii) A community or nontransient, noncommunity water system shall sample quarterly at each surface water entry point to the distribution system.

§290.106(c)(6)(A)(iii) A transient, noncommunity water system shall sample annually at each surface water entry point to the distribution system.

§290.106(c)(6)(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.

§290.106(c)(6)(B)(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.

§290.106(c)(6)(B)(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.

§290.106(c)(6)(B)(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.

§290.106(c)(6)(C) Increased nitrate monitoring frequency. The executive director may increase the nitrate monitoring frequency for community or nontransient, noncommunity water systems using groundwater sources.

§290.106(c)(6)(C)(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.

§290.106(c)(6)(C)(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.

§290.106(c)(7) Nitrite monitoring frequency. All public water systems shall monitor for nitrite at the following frequency.

§290.106(c)(7)(A) All public water systems shall routinely take one nitrite sample during each nine-year compliance cycle. All public water systems 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.

§290.106(c)(7)(B) The executive director may reduce the monitoring frequency for nitrite by granting a waiver to the routine monitoring frequency.

§290.106(c)(7)(B)(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.

§290.106(c)(7)(B)(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.

§290.106(c)(7)(B)(iii) A system that receives a waiver to the routine nitrite monitoring frequency must sample at a frequency specified by the executive director.

§290.106(c)(7)(C) The executive director may increase the monitoring frequency for nitrite.

§290.106(c)(7)(C)(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.

§290.106(c)(7)(C)(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.

§290.106(c)(8) Confirmation sampling for all IOCs. The executive director may require a public water system to confirm the results of any individual sample.

§290.106(c)(8)(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:

§290.106(c)(8)(A)(i) Confirmation samples must be collected at the same entry point to the distribution system as the sample that exceeded the MCL;

§290.106(c)(8)(A)(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

§290.106(c)(8)(A)(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.

§290.106(c)(8)(B) The executive director may require a confirmation sample for any sample with questionable results.

§290.106(c)(9) More frequent monitoring. The executive director may require more frequent monitoring than specified in paragraphs (4) – (7) of this subsection.

§290.106(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.

§290.106(e) Reporting requirements for IOCs. The owner or operator of a public water system shall ensure that the executive director is provided 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. 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.

§290.106(f) Compliance determination for IOCs. Compliance with this section shall be determined using the following criteria.

§290.106(f)(1) Compliance with the MCL for each IOC shall be based on the analytical results obtained at each individual sampling point.

§290.106(f)(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.

§290.106(f)(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.

§290.106(f)(3)(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.

§290.106(f)(3)(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.

§290.106(f)(3)(C) For systems that are sampling more frequently than annually, compliance is based on the running annual average for each sampling point.

§290.106(f)(3)(D) If a single quarterly sample would cause the running annual average to be exceeded, then the system is immediately out of compliance.

§290.106(f)(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.

§290.106(f)(5) The executive director may exclude the results of obvious sampling errors from the compliance calculations.

§290.106(f)(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.

§290.106(f)(7) For purposes of determining compliance, arsenic results must be reported to the nearest 0.001 milligram per liter.

§290.106(f)(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.

§290.106(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.

§290.106(g)(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).

§290.106(g)(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.

§290.106(g)(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.

§290.106(g)(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.

§290.106(g)(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.

§290.106(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.

§290.106(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.

§290.106(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.

Source Note: *The provisions of this §290.106 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective February 19, 2004, 29 TexReg 1373; amended to be effective December 23, 2004, 29 TexReg 11729; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.107. Organic Contaminants

§290.107(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.

§290.107(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.

§290.107(b)(1) The following are MCLs for synthetic organic chemical (SOC) contaminants.

Table 6: §290.107(b)(1) MCLs for Synthetic Organic Contaminants

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

Contaminant	MCL (mg/L)
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

§290.107(b)(2) The following are MCLs for volatile organic chemical (VOC) contaminants.

Table 7: §290.107(b)(2) MCLs for Volatile Organic Contaminants

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

§290.107(b)(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.

§290.107(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.

§290.107(c)(1) SOC monitoring requirements. Monitoring of the SOC contaminants shall be conducted at the frequency and locations given in this paragraph.

§290.107(c)(1)(A) SOC monitoring locations. Monitoring of the SOC contaminants shall be conducted at the following locations.

§290.107(c)(1)(A)(i) Systems shall routinely sample at sample sites representative of each entry point to the distribution system.

§290.107(c)(1)(A)(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.

§290.107(c)(1)(A)(iii) The executive director must approve any change in sampling location.

§290.107(c)(1)(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.

§290.107(c)(1)(C) Routine SOC monitoring frequency. Monitoring of the SOC contaminants shall be conducted at the following frequency.

§290.107(c)(1)(C)(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.

§290.107(c)(1)(C)(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.

§290.107(c)(1)(C)(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.

§290.107(c)(1)(C)(iv) Each public water system shall monitor at the time designated by the executive director within each compliance period.

§290.107(c)(1)(D) Increased SOC monitoring. The executive director may change the monitoring frequency for SOCs.

§290.107(c)(1)(D)(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.

§290.107(c)(1)(D)(ii) The executive director may change the monitoring frequency if an organic SOC contaminant is detected in any sample.

§290.107(c)(1)(D)(ii)(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.

§290.107(c)(1)(D)(ii)(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.

§290.107(c)(1)(D)(ii)(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.

§290.107(c)(1)(D)(ii)(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.

§290.107(c)(1)(D)(ii)(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.

§290.107(c)(1)(D)(ii)(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.

§290.107(c)(1)(D)(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.).

§290.107(c)(1)(D)(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.

§290.107(c)(1)(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:

§290.107(c)(1)(E)(i) previous analytical results;

§290.107(c)(1)(E)(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;

§290.107(c)(1)(E)(iii) the environmental persistence and transport of the pesticide herbicide or contaminant;

§290.107(c)(1)(E)(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;

§290.107(c)(1)(E)(v) elevated nitrate levels at the water supply source; and

§290.107(c)(1)(E)(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.).

§290.107(c)(1)(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.

§290.107(c)(1)(F)(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.

§290.107(c)(1)(F)(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.

§290.107(c)(1)(F)(iii) Compositing may only be permitted at entry points to the distribution system within a single system.

§290.107(c)(2) VOC monitoring requirements. Monitoring of the VOC contaminants shall be conducted at the frequency and locations given in this paragraph.

§290.107(c)(2)(A) VOC monitoring locations. Monitoring of the VOC contaminants shall be conducted at the following locations.

§290.107(c)(2)(A)(i) Systems shall routinely sample at sample sites representative of each entry point to the distribution system.

§290.107(c)(2)(A)(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.

§290.107(c)(2)(A)(iii) The executive director must approve any change in sampling location.

§290.107(c)(2)(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.

§290.107(c)(2)(C) Routine VOC monitoring frequency. Monitoring of the VOC contaminants shall be conducted at the following frequency.

§290.107(c)(2)(C)(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.

§290.107(c)(2)(C)(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.

§290.107(c)(2)(C)(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.

§290.107(c)(2)(C)(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).

§290.107(c)(2)(C)(v) Each public water system shall monitor at the time designated by the executive director within each compliance period.

§290.107(c)(2)(D) Increased VOC monitoring. The executive director may change the monitoring frequency for VOCs.

§290.107(c)(2)(D)(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.

§290.107(c)(2)(D)(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.

§290.107(c)(2)(D)(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:

§290.107(c)(2)(D)(iii)(I) the system must monitor quarterly at each entry point to the distribution system that resulted in a detection;

§290.107(c)(2)(D)(iii)(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;

§290.107(c)(2)(D)(iii)(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;

§290.107(c)(2)(D)(iii)(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

§290.107(c)(2)(D)(iii)(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.

§290.107(c)(2)(D)(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.).

§290.107(c)(2)(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:

§290.107(c)(2)(E)(i) previous analytical results;

§290.107(c)(2)(E)(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;

§290.107(c)(2)(E)(iii) the environmental persistence and transport of the contaminants;

§290.107(c)(2)(E)(iv) the number of persons served by the public water system and the proximity of a smaller system to a larger system;

§290.107(c)(2)(E)(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;

§290.107(c)(2)(E)(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

§290.107(c)(2)(E)(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).

§290.107(c)(2)(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.

§290.107(c)(2)(F)(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.

§290.107(c)(2)(F)(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.

§290.107(c)(2)(F)(iii) Compositing may only be permitted by the executive director at entry points to the distribution system within a single system.

§290.107(c)(2)(F)(iv) Procedures for compositing VOC samples are as stated in 40 Code of Federal Regulations (CFR) §141.24(f)(14)(iv).

§290.107(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.

§290.107(e) Reporting requirements for organic contaminants. The owner or operator of a public water system shall ensure the executive director is provided 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. 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.

§290.107(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.

§290.107(f)(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.

§290.107(f)(1)(A) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

§290.107(f)(1)(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.

§290.107(f)(1)(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.

§290.107(f)(1)(D) If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

§290.107(f)(1)(E) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

§290.107(f)(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.

§290.107(f)(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.

§290.107(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.

§290.107(g)(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).

§290.107(g)(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.

§290.107(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.

Source Note: *The provisions of this §290.107 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective February 19, 2004, 29 TexReg 1373; amended to be effective December 23, 2004, 29 TexReg 11729; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.108. Radionuclides Other than Radon

§290.108(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.

§290.108(b) Maximum contaminant levels (MCL). The concentration of radionuclide contaminants in the water entering the distribution system shall not exceed the following MCLs.

§290.108(b)(1) MCLs for naturally occurring radionuclides are as follows:

§290.108(b)(1)(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;

§290.108(b)(1)(B) 15 pCi/L for gross alpha particle activity (including radium-226 but excluding radon and uranium); and

§290.108(b)(1)(C) 30 micrograms per liter for uranium.

§290.108(b)(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.

§290.108(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.

§290.108(c)(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.

§290.108(c)(1)(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.

§290.108(c)(1)(A)(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.

§290.108(c)(1)(A)(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.

§290.108(c)(1)(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.

§290.108(c)(1)(B)(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.

Table 8: §290.108(c)(1)(B)(i) 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

§290.108(c)(1)(B)(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.

§290.108(c)(1)(B)(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.

§290.108(c)(1)(B)(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.

§290.108(c)(1)(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.

§290.108(c)(1)(C)(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.

§290.108(c)(1)(C)(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.

§290.108(c)(1)(C)(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.

§290.108(c)(1)(C)(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.

§290.108(c)(1)(C)(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.

§290.108(c)(1)(C)(vi) Community public water systems shall conduct monitoring when required by the executive director.

§290.108(c)(1)(D) Historical data. A system may use historical data to comply with the initial monitoring requirement, if approved by the executive director.

§290.108(c)(1)(D)(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.

§290.108(c)(1)(D)(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.

§290.108(c)(1)(D)(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.

§290.108(c)(1)(E) Sample invalidation. The executive director may invalidate the results of obvious sampling or analytic errors.

§290.108(c)(1)(F) Confirmation samples. The executive director may require more frequent monitoring or may require confirmation samples at the executive director's discretion.

§290.108(c)(1)(G) Sampling scheduling. Systems shall monitor at the time designated by the executive director.

§290.108(c)(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.

§290.108(c)(3) Monitoring locations for radionuclide contaminants. Systems must monitor at sample sites described in the system's monitoring plan.

§290.108(c)(3)(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.

§290.108(c)(3)(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.

§290.108(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.

§290.108(e) Reporting requirements. The owner or operator of a public water system must ensure the executive director is provided 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. 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.

§290.108(f) Compliance determination. Compliance with the requirements of this section shall be determined as follows.

§290.108(f)(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.

§290.108(f)(1)(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).

§290.108(f)(1)(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.

§290.108(f)(1)(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.

§290.108(f)(1)(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.

§290.108(f)(1)(E) If a system fails to complete required increased monitoring, the executive director may base compliance on all available sample results.

§290.108(f)(1)(F) If the results at one sample site are in violation, the public water system is in violation.

§290.108(f)(1)(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.

§290.108(f)(1)(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.

§290.108(f)(2) If the average annual MCL for man-made radionuclide set forth in subsection (b) of this section is exceeded, the system has committed an MCL violation.

§290.108(f)(3) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation.

§290.108(f)(4) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

§290.108(f)(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.

§290.108(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.

§290.108(g)(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).

§290.108(g)(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.

§290.108(g)(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.

§290.108(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).

§290.108(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.

§290.108(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.

Source Note: *The provisions of this §290.108 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective December 23, 2004, 29 TexReg 11729; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.109. Microbial Contaminants

§290.109(a) Applicability. All public water systems must produce and distribute water that meets the provisions of this section regarding microbial contaminants.

§290.109(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.

§290.109(b)(1) A public water system is in compliance with the MCL for *Escherichia coli (E. coli)* unless any of the following conditions occur:

§290.109(b)(1)(A) The public water system has an *E. coli*-positive repeat sample following a total-coliform-positive routine sample;

§290.109(b)(1)(B) The public water system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample;

§290.109(b)(1)(C) The public water system fails to take all required repeat samples following an *E. coli*-positive routine sample; or

§290.109(b)(1)(D) The public water system fails to test for *E. coli* when any repeat sample tests positive for total coliform.

§290.109(b)(1)(E) The *E. coli* MCL is defined as when a condition described in subparagraphs (A) - (D) of this paragraph occurs.

§290.109(b)(2) For public water systems required to collect raw groundwater samples, the standard is no detection of fecal indicators in a raw groundwater sample.

§290.109(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.

§290.109(c)(1) Level 1 treatment technique triggers are:

§290.109(c)(1)(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.

§290.109(c)(1)(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.

§290.109(c)(1)(C) When a public water system fails to collect all required repeat samples after a total coliform-positive result.

§290.109(c)(2) Level 2 treatment technique triggers are:

§290.109(c)(2)(A) An *E. coli* MCL violation as specified in subsection (b)(1)(A) - (D) of this section occurs.

§290.109(c)(2)(B) A second Level 1 treatment technique trigger occurs as defined in paragraph (1) of this subsection, 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 and shall complete and submit the executive director-approved Level 1 assessment form.

§290.109(c)(3) Treatment technique assessment requirements are:

§290.109(c)(3)(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.

§290.109(c)(3)(A)(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 training as required in clause (iii) of this subparagraph and any additional 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.

§290.109(c)(3)(A)(ii) Other parties approved by the executive director include, but are not limited to:

§290.109(c)(3)(A)(ii)(I) backflow prevention assembly testers and customer service inspectors licensed under Chapter 30 of this title (relating to Occupational Licenses and Registrations);

§290.109(c)(3)(A)(ii)(II) plumbing inspectors and water supply protection specialists licensed by the Texas State Board of Plumbing Examiners;

§290.109(c)(3)(A)(ii)(III) licensed professional engineers licensed by the Texas Board of Professional Engineers;

§290.109(c)(3)(A)(ii)(IV) circuit riders or technical assistance providers under contract with the executive director or other government agency as approved by the executive director; or

§290.109(c)(3)(A)(ii)(V) utility supervisor or manager supported by various utility staff or other individuals that meet the assessment requirements as described in this paragraph.

§290.109(c)(3)(A)(iii) Assessors who have conducted Level 1 assessments which were determined by the executive director to be insufficient or inadequate may be required to complete additional training or obtain certifications as prescribed by the executive director.

§290.109(c)(3)(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:

§290.109(c)(3)(B)(i) review and identification of inadequacies in sample sites;

§290.109(c)(3)(B)(ii) sampling protocol;

§290.109(c)(3)(B)(iii) sample processing;

§290.109(c)(3)(B)(iv) atypical events that could affect distributed water quality or indicate that distributed water quality was impaired;

§290.109(c)(3)(B)(v) changes in distribution system maintenance and operation that could affect distributed water quality (including, but not limited to water storage);

§290.109(c)(3)(B)(vi) source and treatment considerations that bear on distributed water quality, where appropriate;

§290.109(c)(3)(B)(vii) existing water quality monitoring data; and

§290.109(c)(3)(B)(viii) the possible presence of sanitary defects.

§290.109(c)(3)(C) A public water system shall conduct a Level 1 assessment and complete the executive director-approved Level 1 assessment form when the public water system exceeds one of the treatment technique triggers in paragraph (1) of this subsection. The public water system must note no sanitary defects were identified or describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed in the Level 1 assessment form. At the discretion of the executive director, the public water system shall comply with any additional or expedited corrective actions when there is a potential for an acute health risk.

§290.109(c)(3)(C)(i) Both the Level 1 assessment and the executive director-approved Level 1 assessment form shall be completed and the form submitted to the executive director as soon as practical, but no later than 30 days after the public water system learns that it has exceeded a trigger, or 30 days after all routine and repeat monitoring was required to be completed for the calendar month in which the system exceeded the trigger, whichever is earlier.

§290.109(c)(3)(C)(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.

§290.109(c)(3)(C)(iii) The executive director will determine if the public water system has identified the likely cause(s) of the trigger and, if so, was the cause(s) corrected, or has an acceptable schedule to correct the problem been included. The assessments may also indicate that no sanitary defects were identified.

§290.109(c)(3)(D) A public water system shall ensure that a Level 2 assessment and the executive director-approved Level 2 assessment form are conducted and completed 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.

§290.109(c)(3)(D)(i) After any trigger in paragraph (2) of this subsection, the public water system shall ensure that both the Level 2 assessment and the executive director-approved Level 2 assessment form are 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 and the completed form submitted to the executive director as soon as practical but no later than 30 days after the public water system learns that it has exceeded a trigger in paragraph (2) of this subsection, or 30 days after all routine and repeat monitoring was required to be completed for the calendar month in which the system exceeded the trigger, whichever is earlier.

§290.109(c)(3)(D)(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 from the date of the consultation.

§290.109(c)(3)(D)(iii) After the Level 2 assessment is submitted, the executive director will determine if the public water system has identified the likely cause(s) of the trigger and corrected the cause(s), or has included an acceptable timetable for correcting the cause(s). The assessments may also indicate that no sanitary defects were identified.

§290.109(c)(3)(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.

§290.109(c)(3)(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.

§290.109(d) Monitoring requirements for microbial contaminants. Public water systems shall collect samples for total coliform, fecal coliform, *E. coli* (or other approved fecal indicator) at sampling sites and a sample collection schedule, as designated by the public water system, which are subject to review and revision 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.

§290.109(d)(1) Routine microbial sampling locations. Public water systems shall routinely monitor for microbial contaminants at the following locations.

§290.109(d)(1)(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.

§290.109(d)(1)(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.

§290.109(d)(2) Routine distribution coliform sampling frequency. All public water systems must sample for distribution coliform at the following frequency.

§290.109(d)(2)(A) Community and noncommunity public water systems must collect routine distribution coliform samples at a frequency based on the population served by the system.

§290.109(d)(2)(A)(i) 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.

§290.109(d)(2)(A)(ii) 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.

§290.109(d)(2)(A)(iii) The minimum sampling frequency for public water systems is shown in the following table.

Table 9: §290.109(d)(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

Population Served	Minimum Number of Samples Per Month
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

§290.109(d)(2)(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.

§290.109(d)(2)(C) A public water system which 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.

§290.109(d)(2)(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.

§290.109(d)(2)(E) A total coliform-positive sample invalidated under this subsection does not count towards meeting the minimum routine monitoring requirements of this subsection. Unless the executive director has invalidated the sample in accordance with subsection (e) of this section, all routine coliform sample

results must be used to determine compliance with subsection (b)(1) of this section and to determine treatment technique trigger and assessment requirements as described in subsection (c)(1) and (2) of this section.

§290.109(d)(2)(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.

§290.109(d)(2)(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.

§290.109(d)(3) Repeat distribution coliform sampling requirements. Public water systems shall conduct repeat monitoring if one or more of the routine samples is found to contain coliform organisms.

§290.109(d)(3)(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 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.

§290.109(d)(3)(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.

§290.109(d)(3)(C) Unless the public water system meets the provisions of clause (i) or (ii) of this subparagraph, the public water 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 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, one repeat sample must be collected at that point and the other two repeat samples must be collected within five connections upstream of that point.

§290.109(d)(3)(C)(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.

§290.109(d)(3)(C)(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.

§290.109(d)(3)(C)(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.

§290.109(d)(3)(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. In accordance with 40 Code of Federal Regulations (CFR) §141.858(a)(1) the executive director is prohibited from waiving the requirement for a public water system to collect repeat samples as specified in subparagraphs (A) - (D) of this paragraph. The public water system must repeat this process until either one of the following occurs:

§290.109(d)(3)(D)(i) total coliforms are not detected in one complete set of repeat samples;

§290.109(d)(3)(D)(ii) a coliform treatment technique trigger as described in subsection (c)(1) and (2) of this section has been exceeded; or

§290.109(d)(3)(D)(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.

§290.109(d)(3)(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.

§290.109(d)(3)(F) A total coliform-positive sample invalidated under this subsection does not count towards meeting the minimum repeat monitoring requirements of this subsection. Unless the executive director has invalidated the sample in accordance with subsection (e) of this section, all repeat coliform sample results must be used to determine compliance with subsection (b)(1) of this section and to determine treatment technique trigger and assessment requirements as described in subsection (c)(1) and (2) of this section.

§290.109(d)(4) General requirements for 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.

§290.109(d)(4)(A) Triggered source monitoring general requirements. A groundwater system must conduct triggered source water monitoring for *E. coli* (or other approved fecal indicator), if both of the following conditions exist.

§290.109(d)(4)(A)(i) The system does not provide at least 4-log treatment of viruses (as defined in §290.103(44) of this title (relating to Definitions)) before the first customer for each groundwater source; and

§290.109(d)(4)(A)(ii) The system is notified that a routine distribution coliform sample is positive and the sample is not invalidated under subsection (e)(1) of this section.

§290.109(d)(4)(B) Triggered source monitoring 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.

§290.109(d)(4)(B)(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. If the executive director extends the 24-hour time limit on a case-by-case basis, the public water system must collect the sample within 48 hours.

§290.109(d)(4)(B)(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 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.

§290.109(d)(4)(B)(iii) A groundwater system with one 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 when all of the following requirements are met:

§290.109(d)(4)(B)(iii)(I) the fecal indicator used is *E. coli;*

§290.109(d)(4)(B)(iii)(II) the executive director has provided written approval for the public water system to meet the monitoring requirements for both repeat monitoring under paragraph (3) of this subsection and triggered source monitoring under this paragraph and subparagraph (A) of this paragraph; and

§290.109(d)(4)(B)(iii)(III) the public water system's sample siting plan remains representative of water quality in the distribution system. 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.

§290.109(d)(4)(B)(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 this subparagraph 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.

§290.109(d)(4)(B)(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 clause (iv) of this subparagraph by the number of repeat samples taken at that location that were not *E. coli*-positive.

§290.109(d)(4)(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:

§290.109(d)(4)(C)(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).

§290.109(d)(4)(C)(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) of this section and shall meet the requirements of subparagraph (B)(iv) of this paragraph.

§290.109(d)(4)(C)(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 subparagraph (B)(iv) of this paragraph.

§290.109(d)(4)(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.

§290.109(d)(4)(D)(i) The executive director determines and documents in writing, that the distribution coliform-positive sample is caused by a distribution system deficiency; or

§290.109(d)(4)(D)(ii) The distribution coliform-positive sample is collected at a location that meets the distribution coliform sample invalidation criteria as specified in subsection (e)(1) of this section and the replacement sample is negative for coliforms.

§290.109(d)(4)(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 subparagraph (A) of this paragraph to meet the assessment source monitoring requirement. A groundwater system with a groundwater source sample collected under this subparagraph or under subparagraph (A) of this paragraph 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:

§290.109(d)(4)(E)(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.

§290.109(d)(4)(E)(ii) Collection of samples from each well unless the system has an approved triggered source monitoring plan under subparagraph (B)(ii) of this paragraph.

§290.109(d)(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.

§290.109(d)(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.

§290.109(d)(6)(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, any required SOP, and any sampling point locations necessary to meet the requirements of this subsection shall be reflected in the written Sample Siting Plan. For community and noncommunity public water systems serving 1,000 or fewer people using only groundwater, the executive director shall evaluate during every sanitary survey (on-site inspection) the water system factors (including but not limited to pertinent water quality, compliance history, distribution system, all the components of a sanitary survey and its findings) to ensure the timeframe during the month, locations, and number of microbial compliance monitoring sample sites are adequate for producing and distributing safe drinking water.

§290.109(d)(6)(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.

§290.109(d)(6)(C) The Sample Siting Plan shall include a distribution system map or series of maps 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.

§290.109(d)(6)(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.

§290.109(d)(6)(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.

§290.109(e) 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. The public water system must use a certified laboratory certified for each method and associated contaminant(s) for compliance analyses in accordance with §290.119 of this title.

§290.109(e)(1) Distribution coliform sample invalidation. The executive director may invalidate a distribution total coliform-positive sample if one of the following conditions is met.

§290.109(e)(1)(A) The executive director may invalidate a sample if the laboratory provides written notice that improper sample analysis caused the total coliform-positive result.

§290.109(e)(1)(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 request that the executive director invalidate the sample. The system must provide copies of the routine positive and all repeat samples. The executive director may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative or if the system has only one service connection.

§290.109(e)(1)(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 in subsection (g) of this section and whether a coliform treatment technique trigger has been exceeded as described in subsection (c) 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 system must obtain the written and signed approval from the executive director before the sample can be invalidated under this condition. The executive director may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

§290.109(e)(1)(D) The executive director may invalidate a sample if the laboratory provides written notice that the sample was unsuitable for analysis and the laboratory invalidated the sample based on the requirements of 40 CFR §141.853(c)(2). When the sample is invalidated under this condition, the system must collect another sample from the same location as the original sample within 24 hours of being

notified, 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 executive director may waive the 24-hour time limit on a case-by-case basis. Alternatively, the executive director may implement criteria for waiving the 24-hour sampling time limit to use in lieu of case-by-case extension.

§290.109(e)(1)(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.

§290.109(e)(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) of this section within 24 hours of being notified of the invalidation.

§290.109(e)(2)(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.

§290.109(e)(2)(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).

§290.109(e)(3) Culture analysis. If any distribution system coliform 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 raw groundwater source sample is used to meet the repeat requirements of subsection (d)(3)(C)(ii) and (4)(B)(iii) then it must be analyzed to determine if *E. coli* are present.

§290.109(f) Reporting requirements for microbial contaminants. The owner or operator of a public water system must ensure the executive director is provided 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. 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.

§290.109(g) 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.

§290.109(g)(1) A public water system commits an *E. coli* MCL violation if any of the following conditions occur:

§290.109(g)(1)(A) The public water system has an *E. coli*-positive repeat samples following a total coliform-positive routine sample;

§290.109(g)(1)(B) The public water system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample;

§290.109(g)(1)(C) The public water system fails to take all required repeat samples following an *E. coli*-positive routine sample; or

§290.109(g)(1)(D) The public water system fails to test for *E. coli* when any repeat sample tests positive for total coliform.

§290.109(g)(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)(iv) 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.

§290.109(g)(3) 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 and is required to provide public notification in accordance with §290.122(a) of this title if a source sample is confirmed positive for *E. coli* or other approved fecal indicator.

§290.109(g)(4) A public water system that fails to collect every required routine sample in a compliance period and/or to submit the analytical results to the executive director commits a monitoring violation.

§290.109(g)(5) A public water system that fails to analyze for *E. coli* following a total coliform-positive routine sample commits a monitoring violation.

§290.109(g)(6) A public water system that fails to monitor in accordance with the requirements of subsection (d)(4) of this section commits a monitoring violation and must provide public notification in accordance with §290.122 of this title.

§290.109(g)(7) A public water system that fails to report the results of the monitoring tests required by this section commits a reporting violation.

§290.109(g)(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.

§290.109(g)(9) The results of all routine and repeat distribution coliform samples or groundwater source 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.

§290.109(g)(10) The results of all routine and repeat distribution coliform samples or groundwater source 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.

§290.109(g)(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. Special purpose samples shall not be used to determine whether the coliform treatment technique trigger has been exceeded as described in subsection (c) of this section. Coliform samples taken in accordance with subsection (d)(3) of this section and that are not invalidated under subsection (e) of this section are not considered special purpose samples.

§290.109(g)(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. A seasonal system must certify, prior to serving water to the public, that it has complied with the executive director-approved start-up procedures. 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.

§290.109(g)(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.

§290.109(g)(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.

§290.109(g)(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.

§290.109(g)(16) A public water system that fails to notify the executive director before the end of the day in accordance with subsection (h)(3) of this section commits a reporting violation.

§290.109(h) 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.

§290.109(h)(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 and the public notice requirements of §290.122(a) of this title.

§290.109(h)(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.

§290.109(h)(3) A public water system that has *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.

§290.109(h)(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.

§290.109(h)(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 day, and notify the public in accordance with §290.122(a) of this title.

§290.109(h)(6) 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.

§290.109(h)(7) A public water system that has committed a treatment technique trigger and assessment requirement for coliforms in subsection (c)(1) and (2) of this section and commits a treatment technique violation as described in subsection (g)(15) of this section 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.

§290.109(h)(8) A public water system that commits a treatment technique violation for failure to complete and certify seasonal system start-up procedures as described in subsection (g)(10) and (11) of this section 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. In the notification in accordance with §290.122(b) of this title, if a seasonal system fails to monitor for total coliforms or *E. coli* prior to serving water to the public, it must include the following language: We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During {COMPLIANCE PERIOD}, we “did not monitor or test” or “did not complete all monitoring or testing” for {CONTAMINANT(S)}, and therefore cannot be sure of the quality of your drinking water during that time.

§290.109(i) The executive director, pursuant to 40 CFR §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 subsection (b)(1)(A) - (D) of this section as follows:

§290.109(i)(1) protection of wells from fecal contamination by appropriate placement and construction;

§290.109(i)(2) maintenance of a disinfectant residual throughout the distribution system;

§290.109(i)(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;

§290.109(i)(4) 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;

§290.109(i)(5) 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; or

§290.109(i)(6) 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 subsection (g)(1) of this section.

Source Note: *The provisions of this §290.109 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective November 8, 2012, 37 TexReg 8849; amended to be effective September 12, 2013, 38 TexReg 5880; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.110. Disinfectant Residuals

§290.110(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.

§290.110(b) Minimum and maximum acceptable disinfectant concentrations. All 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.

§290.110(b)(1) The disinfection process used by public water systems must ensure that water has been adequately disinfected before it enters the distribution system.

§290.110(b)(1)(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).

§290.110(b)(1)(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).

§290.110(b)(1)(C) The disinfection process at other types of treatment plants shall provide the level of disinfection required by the executive director.

§290.110(b)(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).

§290.110(b)(3) The chlorine dioxide residual of the water entering the distribution system shall not exceed an MRDL of 0.8 mg/L.

§290.110(b)(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).

§290.110(b)(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.

§290.110(c) Monitoring requirements. All 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.

§290.110(c)(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.

§290.110(c)(1)(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.

§290.110(c)(1)(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.

§290.110(c)(1)(B)(i) If a system uses grab samples, the samples must be collected on an ongoing basis at the frequency prescribed in the following table.

Table 10: §290.110(c)(1)(B)(i) 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

§290.110(c)(1)(B)(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.

§290.110(c)(1)(B)(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.

§290.110(c)(1)(C) Continuous monitors must record the disinfectant residual of the water every 30 minutes.

§290.110(c)(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.

§290.110(c)(2)(A) A public water system that uses free chlorine must measure free chlorine.

§290.110(c)(2)(B) A public water system that has a chloramine residual must measure total chlorine.

§290.110(c)(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.

§290.110(c)(3)(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.

§290.110(c)(3)(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.

§290.110(c)(4) Distribution system compliance monitoring. All public water systems shall monitor the disinfectant residual at various locations throughout the distribution system.

§290.110(c)(4)(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.

§290.110(c)(4)(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.

§290.110(c)(4)(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.

§290.110(c)(4)(D) All public water systems must monitor the residual disinfectant concentration at the same time and at the same sampling site 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.

§290.110(c)(4)(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.

§290.110(c)(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.

§290.110(c)(5)(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.

§290.110(c)(5)(B) Water entering distribution system. All public water systems that have chloramines present shall perform sampling to represent the water entering the distribution system.

§290.110(c)(5)(B)(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.

§290.110(c)(5)(B)(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).

§290.110(c)(5)(B)(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.

§290.110(c)(5)(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.

§290.110(c)(5)(C)(i) Sampling must be performed upstream of the chlorine or ammonia chemical injection point, whichever is furthest upstream.

§290.110(c)(5)(C)(ii) Sampling must be performed downstream of all the chlorine and ammonia chemical injection points.

§290.110(c)(5)(C)(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).

§290.110(c)(5)(C)(iv) The total chlorine, ammonia (as nitrogen), and monochloramine residuals must all be monitored if the treatment occurs before the entry point.

§290.110(c)(5)(C)(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.

§290.110(c)(5)(D) Distribution system. Public water systems that distribute water and have a chloramine residual must ensure the efficacy of disinfection within the distribution system.

§290.110(c)(5)(D)(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.

§290.110(c)(5)(D)(ii) Nitrite and nitrate (as nitrogen) must be monitored quarterly.

§290.110(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.

§290.110(d)(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.

§290.110(d)(2) 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.

§290.110(d)(3) The free ammonia level must be measured to a minimum accuracy of plus or minus 0.1 mg/L.

§290.110(d)(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.

§290.110(d)(5) The nitrate (as nitrogen) level must be measured to a minimum accuracy of plus or minus 0.1 mg/L.

§290.110(d)(6) The nitrite (as nitrogen) level must be measured to a minimum accuracy of plus or minus 0.01 mg/L.

§290.110(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.

§290.110(e)(1) Public water 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.

§290.110(e)(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.

§290.110(e)(3) Public water systems that use chlorine dioxide must submit a Chlorine Dioxide Monthly Operating Report (commission Form 0690) each month.

§290.110(e)(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.

§290.110(e)(4)(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.

§290.110(e)(4)(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.

§290.110(e)(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.

§290.110(e)(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.

§290.110(f) Compliance determinations. Compliance with the requirements of this section shall be determined using the following criteria.

§290.110(f)(1) All samples used for compliance must be obtained at sampling sites designated in the monitoring plan.

§290.110(f)(1)(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.

§290.110(f)(1)(B) Samples collected at sites in the distribution system not designated in the monitoring plan shall not be included in the compliance determination calculations.

§290.110(f)(2) A public water system that fails to conduct the monitoring tests required by this section commits a monitoring violation.

§290.110(f)(3) A public water system that fails to report the results of the monitoring tests required by this section commits a reporting violation.

§290.110(f)(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.

§290.110(f)(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.

§290.110(f)(5)(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.

§290.110(f)(5)(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.

§290.110(f)(5)(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.

§290.110(f)(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 1. 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).

§290.110(f)(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.

§290.110(f)(8) Public water systems 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.

§290.110(f)(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.

§290.110(f)(10) A public water system that fails to issue a required public notice or certify that it has issued that notice commits a violation.

§290.110(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.

§290.110(g)(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).

§290.110(g)(1)(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.

§290.110(g)(1)(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.

§290.110(g)(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.

§290.110(g)(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.

§290.110(g)(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.

§290.110(g)(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.

§290.110(g)(6) A public water system that uses chloramines shall notify their retail and wholesale customers of the use of chloramines.

§290.110(g)(6)(A) This notification must contain the exact wording included in Appendix H of §290.47 of this title (relating to Appendices).

§290.110(g)(6)(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.

§290.110(g)(6)(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.

§290.110(g)(6)(D) New customers must also be notified before they begin receiving water from the water system.

§290.110(g)(6)(E) Where appropriate, the notice must be multilingual.

Source Note: *The provisions of this §290.110 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective November 8, 2012, 37 TexReg 8849; amended to be effective July 30, 2015, 40 TexReg 4769; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.111. Surface Water Treatment

§290.111(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.

§290.111(a)(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.

§290.111(a)(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.

§290.111(a)(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.

§290.111(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*.

§290.111(b)(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.

§290.111(b)(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.

§290.111(b)(3) Sampling parameters and frequency. A system must collect raw water samples at a frequency approved by the executive director.

§290.111(b)(3)(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:

§290.111(b)(3)(A)(i) serves at least 10,000 people; or

§290.111(b)(3)(A)(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.

§290.111(b)(3)(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.

§290.111(b)(3)(B)(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.

§290.111(b)(3)(B)(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.

§290.111(b)(3)(B)(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.

§290.111(b)(3)(C) The executive director may approve an alternate sampling frequency for intakes and wells that operate only part of the year.

§290.111(b)(4) Sampling schedule and dates. A system must collect raw water samples in accordance with a schedule approved by the executive director.

§290.111(b)(4)(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.”

Table 11: §290.111(b)(4)(A) Raw Source Water Monitoring Schedule

Systems that are not part of a combined distribution system1 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.

§290.111(b)(4)(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:

§290.111(b)(4)(B)(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

§290.111(b)(4)(B)(ii) begin the second round of special raw surface water monitoring no later than six years after initial bin classification.

§290.111(b)(4)(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.

§290.111(b)(4)(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.

§290.111(b)(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.

§290.111(b)(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.

§290.111(b)(6)(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.

§290.111(b)(6)(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.

§290.111(b)(6)(B)(i) Systems must ensure that samples are maintained between 0 degrees Celsius and 10 degrees Celsius during storage and transportation to the laboratory.

§290.111(b)(6)(B)(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.

§290.111(b)(6)(B)(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.

§290.111(b)(6)(C) Turbidity samples must be analyzed using a method and at a laboratory approved by the executive director.

§290.111(b)(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.

§290.111(b)(7)(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).

§290.111(b)(7)(A)(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.

§290.111(b)(7)(A)(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.

§290.111(b)(7)(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.

§290.111(b)(7)(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.

§290.111(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.

§290.111(c)(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.

§290.111(c)(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*.

§290.111(c)(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.

§290.111(c)(3)(A) The average *Cryptosporidium* level and bin classification shall be determined in accordance with the requirements established by 40 CFR §141.710.

§290.111(c)(3)(A)(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.

§290.111(c)(3)(A)(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.

§290.111(c)(3)(A)(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.

§290.111(c)(3)(A)(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.

§290.111(c)(3)(A)(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.

§290.111(c)(3)(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.

Table 12: §290.111(c)(3)(B) 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.

§290.111(c)(3)(B)(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."

Table 13: §290.111(c)(3)(B)(i) 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

§290.111(c)(3)(B)(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.

§290.111(c)(3)(B)(iii) The executive director may allow a system making capital improvements an additional two years to comply with the treatment requirement of this paragraph.

§290.111(c)(3)(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).

§290.111(c)(3)(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*.

§290.111(c)(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*.

§290.111(c)(5) The executive director may require additional levels of treatment in cases of poor source water quality.

§290.111(c)(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.

§290.111(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.

§290.111(d)(1) Inactivation table. The disinfection process must achieve the minimum microbial inactivation levels shown in the following table.

Table 14: §290.111(d)(1) Microbial Inactivation Requirements

Pretreatment Provided	Filter Technology Used			
	Conventional Filters[1]		Membrane Filters and Cartridge Filters[2]	
	Giardia	Virus	Giardia[3]	Virus
No coagulation	NA[4]	NA[5]	0.0-log	4.0-log
Coagulation and flocculation	1.0-log	3.0-log	0.0-log	3.0-log
Coagulation, flocculation, andclarification	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.
[5] NA = Not Allowed. Conventional filtration with no coagulation is not allowed to receive Giardia or viral treatment credit.

§290.111(d)(1)(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.

§290.111(d)(1)(B) The executive director may require additional levels of treatment in cases of poor source water quality.

§290.111(d)(1)(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.

§290.111(d)(1)(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.

§290.111(d)(1)(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.

§290.111(d)(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.

§290.111(d)(2)(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.

§290.111(d)(2)(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.

§290.111(d)(2)(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.

§290.111(d)(3) Monitoring requirements for UV disinfection facilities. Public water systems must monitor the performance of the UV disinfection facilities.

§290.111(d)(3)(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.

§290.111(d)(3)(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.

§290.111(d)(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).

§290.111(d)(4)(A) The pH analysis must be conducted using a pH meter with a minimum accuracy of plus or minus 0.1 pH units.

§290.111(d)(4)(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.

§290.111(d)(4)(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.

§290.111(d)(4)(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.

§290.111(d)(4)(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.

§290.111(d)(4)(F) The UV dose must be measured by a calibrated sensor approved by the executive director.

§290.111(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.

§290.111(e)(1) Treatment technique requirements for combined filter effluent. Treatment plants using conventional media filtration must meet the following turbidity requirements.

§290.111(e)(1)(A) The turbidity level of the combined filter effluent must never exceed 1.0 nephelometric turbidity unit (NTU).

§290.111(e)(1)(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.

§290.111(e)(2) Performance criteria for individual filter effluent. The filtration techniques must ensure the public water system meets the following performance criteria.

§290.111(e)(2)(A) The turbidity from each individual filter effluent should never exceed 1.0 NTU.

§290.111(e)(2)(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.

§290.111(e)(3) Routine turbidity monitoring requirements. A system must monitor the performance of its filtration facilities.

§290.111(e)(3)(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.

§290.111(e)(3)(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.

§290.111(e)(3)(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.

§290.111(e)(3)(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:

§290.111(e)(3)(D)(i) continuously monitor the turbidity of the combined filter effluent and record the turbidity value every 15 minutes; and

§290.111(e)(3)(D)(ii) measure and record the turbidity level at the effluent of each filter at least once each day the plant is in operation.

§290.111(e)(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 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.

§290.111(e)(4)(A) A public water system that fails to meet the turbidity criteria specified in paragraph (2) of this subsection must conduct additional monitoring.

§290.111(e)(4)(A)(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.

§290.111(e)(4)(A)(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.

§290.111(e)(4)(A)(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.

§290.111(e)(4)(A)(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.

§290.111(e)(4)(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.

§290.111(e)(4)(B)(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.

§290.111(e)(4)(B)(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.

§290.111(e)(4)(B)(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.

§290.111(e)(4)(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.

§290.111(e)(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).

§290.111(e)(5)(A) Turbidity must be measured with turbidimeters that use a method that conforms with the requirements as described in §290.119 of this title.

§290.111(e)(5)(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.

§290.111(e)(5)(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.

§290.111(e)(5)(C)(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.

§290.111(e)(5)(C)(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.

§290.111(e)(5)(C)(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.

§290.111(e)(5)(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.

§290.111(e)(5)(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 in this subchapter. The turbidity equipment and all associated recording devices shall read and record levels:

§290.111(e)(5)(E)(i) at least 10% higher than the turbidity level needed to determine compliance with the highest applicable regulatory requirement as described in this subchapter;

§290.111(e)(5)(E)(ii) at the lowest method detection limit of the approved turbidimeter; and

§290.111(e)(5)(E)(iii) at the precision and accuracy necessary to determine compliance with the requirements as described in this subchapter.

§290.111(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.

§290.111(f)(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.

§290.111(f)(1)(A) The filtration facilities must meet combined filter effluent and individual filter effluent turbidity limits established by the executive director.

§290.111(f)(1)(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.

§290.111(f)(2) Monitoring requirements. A system must monitor the performance of its filtration facilities.

§290.111(f)(2)(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.

§290.111(f)(2)(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.

§290.111(f)(2)(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.

§290.111(f)(2)(D) A system using membranes must conduct direct integrity testing on each membrane unit using a procedure approved by the executive director.

§290.111(f)(2)(D)(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.

§290.111(f)(2)(D)(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.

§290.111(f)(2)(D)(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.

§290.111(f)(2)(D)(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.

§290.111(f)(2)(D)(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.

§290.111(f)(2)(D)(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.

§290.111(f)(2)(E) A system that uses cartridge filters must continuously monitor the performance of the filtration process in a manner approved by the executive director.

§290.111(f)(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.

§290.111(f)(3)(A) Turbidity of the combined effluent must be measured with turbidimeters that meet the requirements of subsection (e)(5)(A) of this section.

§290.111(f)(3)(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.

§290.111(f)(3)(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.

§290.111(f)(3)(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.

§290.111(f)(3)(D)(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.

§290.111(f)(3)(D)(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.

§290.111(f)(3)(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.

§290.111(f)(3)(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:

§290.111(f)(3)(F)(i) at least 10% higher than the turbidity level needed to determine compliance with the highest applicable regulatory requirement as described in this subchapter;

§290.111(f)(3)(F)(ii) at the lowest method detection limit of the approved turbidimeter; and

§290.111(f)(3)(F)(iii) at the precision and accuracy necessary to determine compliance with the requirements as described in this subchapter.

§290.111(f)(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.

§290.111(f)(4)(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.

§290.111(f)(4)(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.

§290.111(f)(4)(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.

§290.111(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.

§290.111(g)(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.

§290.111(g)(1)(A) The executive director will approve the additional credit for a plant if:

§290.111(g)(1)(A)(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;

§290.111(g)(1)(A)(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

§290.111(g)(1)(A)(iii) no individual filter produced water with turbidity level above 0.3 NTU in two consecutive 15-minute readings.

§290.111(g)(1)(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:

§290.111(g)(1)(B)(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

§290.111(g)(1)(B)(ii) the system has experienced no more than two such failures within the most recent 12 months.

§290.111(g)(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:

§290.111(g)(2)(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;

§290.111(g)(2)(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

§290.111(g)(2)(C) the plant does not receive additional treatment credit under paragraph (1) of this subsection.

§290.111(g)(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:

§290.111(g)(3)(A) the filters in both stages meet minimum design criteria approved by the executive director;

§290.111(g)(3)(B) all of the water produced by the plant passes through both stages of filtration;

§290.111(g)(3)(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

§290.111(g)(3)(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.

§290.111(g)(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.

§290.111(g)(4)(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.

§290.111(g)(4)(B) The alternative strategy must conform to any applicable requirement of 40 CFR §§141.715 - 141.720.

§290.111(g)(4)(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.

§290.111(g)(4)(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.

§290.111(h) Reporting requirements. Public water systems must properly complete and submit periodic reports to demonstrate compliance with this section.

§290.111(h)(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.

§290.111(h)(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.

§290.111(h)(2)(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.

§290.111(h)(2)(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).

§290.111(h)(2)(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.

§290.111(h)(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.

§290.111(h)(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.

§290.111(h)(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.

§290.111(h)(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.

§290.111(h)(7) A system must submit its *Cryptosporidium* bin classification.

§290.111(h)(8) A system must submit reports required by subsection (b)(7) of this section.

§290.111(h)(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.

§290.111(i) Compliance determination. Compliance with the requirements of this section must be determined using the criteria of this subsection.

§290.111(i)(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.

§290.111(i)(2) A public water system that fails to submit a report required by subsection (h) of this section commits a reporting violation.

§290.111(i)(3) 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).

§290.111(i)(3)(A) A public water system using conventional filters that has a turbidity level exceeding 5.0 NTU in the combined filter effluent.

§290.111(i)(3)(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.

§290.111(i)(3)(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.

§290.111(i)(3)(D) A public water system that fails to submit a report required by subsection (h) of this section for two consecutive months.

§290.111(i)(3)(E) A public water system using membrane or cartridge filters that has a turbidity level exceeding 1.0 NTU in the combined filter effluent.

§290.111(i)(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.

§290.111(i)(4)(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.

§290.111(i)(4)(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.

§290.111(i)(4)(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.

§290.111(i)(4)(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.

§290.111(i)(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.

§290.111(i)(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.

§290.111(i)(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.

§290.111(i)(8) A system that fails to properly issue a public notice required by subsection (j) of this section commits a violation.

§290.111(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.

§290.111(j)(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).

§290.111(j)(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.

§290.111(j)(2)(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.

§290.111(j)(2)(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.

§290.111(j)(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.

§290.111(j)(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.

Source Note: The provisions of this §290.111 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective February 19, 2004, 29 TexReg 1373; amended to be effective December 23, 2004, 29 TexReg 11729; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective May 15, 2011, 36 TexReg 2860; amended to be effective November 8, 2012, 37 TexReg 8849; amended to be effective July 30, 2015, 40 TexReg 4769; amended to be effective March 30, 2017, 42 TexReg 1466

§290.112. Total Organic Carbon (TOC)

§290.112(a) Applicability. A water treatment plant must meet the provisions of this section if the plant:

§290.112(a)(1) serves a community or nontransient, noncommunity public water system;

§290.112(a)(2) treats surface water or groundwater under the direct influence of surface water; and

§290.112(a)(3) uses a series of treatment processes that includes coagulation, flocculation, sedimentation or clarification, and filtration as part of the overall treatment protocol.

§290.112(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.

§290.112(b)(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.

Table 15: §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

§290.112(b)(2) Systems may determine their ability to meet one of the eight alternative compliance criteria listed in this paragraph.

§290.112(b)(2)(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.

§290.112(b)(2)(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.

§290.112(b)(2)(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.

§290.112(b)(2)(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.

§290.112(b)(2)(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.

§290.112(b)(2)(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.

§290.112(b)(2)(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.

§290.112(b)(2)(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.

§290.112(b)(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.

§290.112(b)(3)(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).

§290.112(b)(3)(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.

§290.112(b)(3)(C) The executive director may approve Step 2 alternative removal requirements.

§290.112(b)(3)(C)(i) If approved, the removal achieved at the PODR becomes the alternative full-scale TOC removal requirement for the plant.

§290.112(b)(3)(C)(ii) The alternate removal requirements may be applied to the quarter in which the jar test results are received and for the following quarter.

§290.112(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.

§290.112(c)(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.

§290.112(c)(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.

§290.112(c)(2)(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.

§290.112(c)(2)(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.

§290.112(c)(2)(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.

§290.112(c)(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.

§290.112(c)(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.

§290.112(c)(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.

§290.112(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).

§290.112(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.

§290.112(e)(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.

§290.112(e)(2) Public water systems must submit a Monthly Operational Report for Total Organic Carbon (commission Form 0879) each month.

§290.112(e)(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.

§290.112(e)(3)(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.

§290.112(e)(3)(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.

§290.112(e)(3)(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.

§290.112(e)(3)(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.

§290.112(e)(3)(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.

§290.112(e)(3)(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.

§290.112(f) Compliance determination. Compliance with the requirements of this section shall be based on the following criteria:

§290.112(f)(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.

§290.112(f)(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.

§290.112(f)(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:

§290.112(f)(3)(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)). The actual monthly percent removal is calculated as the average of all actual removals for all TOC sample sets collected in the month, expressed as a percent.

§290.112(f)(3)(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.

§290.112(f)(3)(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.

§290.112(f)(3)(C)(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.

§290.112(f)(3)(C)(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.

§290.112(f)(3)(C)(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.

§290.112(f)(3)(C)(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.

§290.112(f)(3)(D) The annual average removal ratio must be determined. The annual average removal ratio is the average of all monthly removal ratios over the most recent 12-month period. To determine the annual average removal ratio, determine the sum of all monthly removal ratios in the most recent 12-month period, and divide that sum by 12.

§290.112(f)(3)(E) If the annual average removal ratio is less than 1.00, the system commits a treatment technique violation.

§290.112(f)(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.

§290.112(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.

§290.112(g)(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).

§290.112(g)(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.

Source Note: *The provisions of this §290.112 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective May 15, 2011, 36 TexReg 2860; amended to be effective November 8, 2012, 37 TexReg 8849; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.113. Stage 1 Disinfection Byproducts (TTHM and HAA5)

§290.113(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.

§290.113(a)(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."

§290.113(a)(2) Until the date shown in the table in Figure: 30 TAC §290.113(a)(2) of this paragraph, systems must continue to monitor according to this section.

Table 16: §290.113(a)(2) 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

§290.113(b) Maximum contaminant level (MCL) for TTHM and HAA5. The running annual average concentration of TTHM and HAA5 shall not exceed the MCLs.

§290.113(b)(1) The MCL for TTHM is 0.080 milligrams/liter (mg/L).

§290.113(b)(2) The MCL for HAA5 is 0.060 mg/L.

§290.113(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.

§290.113(c)(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.

§290.113(c)(2) All samples taken within one sampling period shall be collected within a 24-hour period.

§290.113(c)(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."

Table 17: §290.113(c)(3) 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 serving at least 10,000 persons	four water samples per quarter per treatment plant	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 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.

Type of System	Minimum Monitoring Frequency	Sample Location in the Distribution System
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.

§290.113(c)(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."

Table 18: §290.113(c)(4) 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

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 from 500 to 9,999 people 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 year at distribution system location reflecting maximum residence time during month of warmest water temperature.
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))

§290.113(c)(4)(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.

§290.113(c)(4)(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.

§290.113(c)(4)(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.

§290.113(c)(4)(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.

§290.113(c)(5) The executive director may require a system to return to the routine monitoring frequency described in paragraph (3) of this subsection.

§290.113(c)(5)(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.

§290.113(c)(5)(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.

§290.113(c)(5)(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.

§290.113(c)(5)(D) The executive director may return a system on reduced monitoring to routine monitoring at any time.

§290.113(c)(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.

§290.113(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.

§290.113(e) Reporting requirements for TTHM and HAA5. The owner or operator of a public water system must ensure the executive director is provided 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. 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.

§290.113(f) Compliance determination for TTHM and HAA5. Compliance with the provisions of this section shall be determined as follows.

§290.113(f)(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.

§290.113(f)(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.

§290.113(f)(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.

§290.113(f)(3)(A) A public water system that samples for TTHM and HAA5 each quarter must calculate the running annual average of the quarterly averages.

§290.113(f)(3)(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.

§290.113(f)(3)(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.

§290.113(f)(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.

§290.113(f)(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.

§290.113(f)(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.

§290.113(f)(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.

§290.113(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.

§290.113(g)(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).

§290.113(g)(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.

§290.113(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).

Source Note: *The provisions of this §290.113 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective May 15, 2011, 36 TexReg 2860; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.114. Other Disinfection Byproducts (Chlorite and Bromate)

§290.114(a) Chlorite. All public water systems that use chlorine dioxide must comply with the requirements of this subsection.

§290.114(a)(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).

§290.114(a)(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.

§290.114(a)(2)(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.

§290.114(a)(2)(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."

§290.114(a)(2)(B)(i) Each system must collect at least one three-sample set each month.

§290.114(a)(2)(B)(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.

§290.114(a)(2)(B)(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.

§290.114(a)(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).

§290.114(a)(3)(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.

§290.114(a)(3)(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.

§290.114(a)(4) Reporting requirements for chlorite. Public water systems that are subject to the provisions of this subsection must ensure the executive director is provided with the results of any test, measurement, or analysis required by this section.

§290.114(a)(4)(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.

§290.114(a)(4)(B) Except where a shorter period is specified in this section, a public water system shall ensure the executive director is provided 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.

§290.114(a)(4)(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.

§290.114(a)(5) Compliance determination for chlorite. Compliance with the requirements of this subsection shall be based on the following criteria.

§290.114(a)(5)(A) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation.

§290.114(a)(5)(B) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

§290.114(a)(5)(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.

§290.114(a)(5)(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.

§290.114(a)(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.

§290.114(a)(6)(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).

§290.114(a)(6)(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.

§290.114(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.

§290.114(b)(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.

§290.114(b)(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.

§290.114(b)(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.

§290.114(b)(4) Reporting requirements for bromate. The owner or operator of a public water system must ensure the executive director is provided 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. 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.

§290.114(b)(5) Compliance determination for bromate. Compliance with the requirements of this subsection shall be determined using the following criteria.

§290.114(b)(5)(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.

§290.114(b)(5)(B) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

§290.114(b)(5)(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.

§290.114(b)(5)(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.

§290.114(b)(5)(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.

§290.114(b)(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.

§290.114(b)(6)(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.

§290.114(b)(6)(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.

Source Note: *The provisions of this §290.114 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective May 15, 2011, 36 TexReg 2860; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.115. Stage 2 Disinfection Byproducts (TTHM and HAA5)

§290.115(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.

§290.115(a)(1) Systems must comply with the initial monitoring requirements starting on the dates given in subsection (c) of this section.

§290.115(a)(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."

Table 19: §290.115(a)(2) 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).

§290.115(a)(2)(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."

§290.115(a)(2)(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.

§290.115(a)(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."

§290.115(b) Maximum contaminant levels (MCL) and operational evaluation levels (OELs) for TTHM and HAA5. Systems shall comply with MCLs and OELs.

§290.115(b)(1) The locational running annual average (LRAA) concentration of TTHM and HAA5 shall not exceed the MCLs. A public water system that exceeds a MCL shall determine compliance as described in subsection (f) of this section.

§290.115(b)(1)(A) The MCL for TTHM is 0.080 milligrams/liter (mg/L).

§290.115(b)(1)(B) The MCL for HAA5 is 0.060 mg/L.

§290.115(b)(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.

§290.115(b)(2)(A) The OEL for TTHM is 0.080 mg/L.

§290.115(b)(2)(B) The OEL for HAA5 is 0.060 mg/L.

§290.115(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.

§290.115(c)(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."

Table 20: §290.115(c)(1) 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

§290.115(c)(1)(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.

§290.115(c)(1)(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.

§290.115(c)(1)(B)(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.

§290.115(c)(1)(B)(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.

§290.115(c)(1)(B)(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.

§290.115(c)(1)(C) The protocol given in 40 Code of Federal Regulations (CFR) §141.605(c) - (e) for selecting Stage 2 sample sites is hereby adopted by reference.

§290.115(c)(1)(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.

§290.115(c)(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.

Table 21: §290.115(c)(2) Routine Stage 2 Monitoring Frequency and Number of Sites

Water Type	Retail Population	Routine Frequency [1]	Routine Number of Sites [2]
Surface Water (or Groundwater Under the Direct Influence of Surface Water) [3]	fewer than 500	annual	1 or 2 [4]
	500 to 3,300	quarterly	1 or 2 [4]
	3,301 to 9,999	quarterly [5]	2
	10,000 to 49,999	quarterly [5]	4
	50,000 to 249,999	quarterly [5]	8
	250,000 to 999,999	quarterly [5]	12
	1,000,000 to 4,999,999	quarterly [5]	16
	5,000,000 or more	quarterly [5]	20
	fewer than 500	annual	1 or 2 [4]
	500 to 9,999	annual	2
	10,000 to 99,999	quarterly [5]	4
	100,000 to 499,999	quarterly [5]	6
	500,000 or more	quarterly [5]	8

[1] All systems must monitor during month of highest disinfection byproduct concentrations.
[2] Monitoring locations must be approved by the executive director.
[3] 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.
[4] 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.
[5] Systems on quarterly monitoring must take dual sample sets every 90 days.

§290.115(c)(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."

Table 22: §290.115(c)(3) 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.

§290.115(c)(3)(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.

§290.115(c)(3)(B) In order to remain on reduced monitoring, a system must meet the applicable conditions of this subparagraph.

§290.115(c)(3)(B)(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.

§290.115(c)(3)(B)(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.

§290.115(c)(3)(B)(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)).

§290.115(c)(3)(C) Systems will be returned to routine monitoring:

§290.115(c)(3)(C)(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

§290.115(c)(3)(C)(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

§290.115(c)(3)(C)(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.

§290.115(c)(3)(D) The executive director may return a system on reduced monitoring to routine monitoring at any time.

§290.115(c)(3)(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.

§290.115(c)(3)(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:

§290.115(c)(3)(F)(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

§290.115(c)(3)(F)(ii) meets the reduced monitoring criteria in subparagraph (B) of this paragraph, and

§290.115(c)(3)(F)(iii) is approved to use the same monitoring locations under Stage 1 and Stage 2.

§290.115(c)(3)(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.

§290.115(c)(4) Increased monitoring for TTHM and HAA5. The executive director may increase monitoring in accordance with this paragraph.

§290.115(c)(4)(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.

§290.115(c)(4)(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.

§290.115(c)(4)(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.

§290.115(c)(5) 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.

§290.115(c)(5)(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.

§290.115(c)(5)(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 Waiver Initial Distribution System Evaluation (IDSE) Waiver."

Table 23: §290.115(c)(5)(B) 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.

§290.115(c)(5)(B)(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.

§290.115(c)(5)(B)(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.

§290.115(c)(5)(B)(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.

§290.115(c)(5)(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 System Evaluation (IDSE) Schedule."

Table 24: §290.115(c)(5)(C) 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.

§290.115(c)(5)(C)(i) The IDSE plan has required elements.

§290.115(c)(5)(C)(i)(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.

§290.115(c)(5)(C)(i)(II) The IDSE plan must include justification of IDSE monitoring location selection and a summary of data used to justify IDSE monitoring location selection.

§290.115(c)(5)(C)(i)(III) The IDSE plan must include the system type and population served by the system.

§290.115(c)(5)(C)(ii) Systems must do required IDSE sampling in accordance with this clause.

§290.115(c)(5)(C)(ii)(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) Sample Sites:"

Table 25: §290.115(c)(5)(C)(ii) 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

§290.115(c)(5)(C)(ii)(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.

§290.115(c)(5)(C)(ii)(III) IDSE sample locations must be different than the existing Stage 1 monitoring locations established under §290.113 of this title.

§290.115(c)(5)(C)(ii)(IV) IDSE sample locations must be distributed throughout the distribution system.

§290.115(c)(5)(C)(ii)(V) Systems must monitor at the frequency indicated in the following table titled "Frequency of Initial Distribution System Evaluation (IDSE) Monitoring":

Table 26: §290.115(c)(5)(C)(ii)(V) 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.

§290.115(c)(5)(C)(ii)(VI) The IDSE monitoring frequency and locations may not be reduced.

§290.115(c)(5)(C)(iii) The IDSE report must comply with the elements in this clause.

§290.115(c)(5)(C)(iii)(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 regulatory guidance number 384: "How to Develop a Monitoring Plan for a Public Water System."

§290.115(c)(5)(C)(iii)(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.

§290.115(c)(5)(C)(iii)(III) The IDSE report must include an explanation of any deviations from the approved IDSE plan.

§290.115(c)(5)(C)(iii)(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.

§290.115(c)(5)(C)(iii)(V) The IDSE report must include recommendations and justification for when Stage 2 samples should be collected.

§290.115(c)(5)(C)(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.

§290.115(c)(5)(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.

§290.115(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.

§290.115(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.

§290.115(e)(1) The owner or operator of a public water system must ensure the executive director is provided 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.

§290.115(e)(1)(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:

§290.115(e)(1)(A)(i) number of samples taken during the last quarter;

§290.115(e)(1)(A)(ii) date and results of each sample taken during the last quarter;

§290.115(e)(1)(A)(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;

§290.115(e)(1)(A)(iv) whether the MCL was violated at any monitoring location; and

§290.115(e)(1)(A)(v) any OELs that were exceeded during the quarter and, if so, the location and date, and the calculated TTHM and HAA5 levels.

§290.115(e)(1)(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.

§290.115(e)(1)(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).

§290.115(e)(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.

§290.115(e)(2)(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.

§290.115(e)(2)(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:

§290.115(e)(2)(B)(i) storage tank operations;

§290.115(e)(2)(B)(ii) excess storage capacity;

§290.115(e)(2)(B)(iii) distribution system flushing;

§290.115(e)(2)(B)(iv) changes in sources or source water quality;

§290.115(e)(2)(B)(v) treatment changes or problems; and

§290.115(e)(2)(B)(vi) what steps could be considered to minimize future exceedances.

§290.115(e)(2)(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.

§290.115(e)(2)(D) The operation evaluation report must be submitted and approved in writing.

§290.115(f) Compliance determination for TTHM and HAA5. Compliance with the provisions of this section shall be determined as follows.

§290.115(f)(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.

§290.115(f)(1)(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.

§290.115(f)(1)(B) Stage 2 MCL compliance determination with LRAAs will start after Stage 2 samples are collected.

§290.115(f)(1)(B)(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.

§290.115(f)(1)(B)(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.

§290.115(f)(1)(B)(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.

§290.115(f)(1)(B)(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.

§290.115(f)(1)(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.

§290.115(f)(1)(D) The executive director may choose to perform calculations and determine MCL exceedances in lieu of having the system report that information.

§290.115(f)(1)(E) IDSE results will not be used for the purpose of determining compliance with MCLs.

§290.115(f)(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.

§290.115(f)(3) A system that fails to perform a required operation evaluation under subsection (e)(2) of this section commits a monitoring violation.

§290.115(f)(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.

§290.115(f)(5) A system that fails to submit an operation evaluation report as required under subsection (e)(2) of this section commits a reporting violation.

§290.115(f)(6) A system that fails to perform a required public notification commits a public notification violation.

§290.115(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.

§290.115(g)(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).

§290.115(g)(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.

§290.115(g)(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.

§290.115(g)(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.

§290.115(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).

Source Note: *The provisions of this §290.115 adopted to be effective January 9, 2008, 33 TexReg 198; amended to be effective May 15, 2011, 36 TexReg 2860*

§290.116. Groundwater Corrective Actions and Treatment Techniques

§290.116(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), 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)(3)(C)(ii), (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 §290.109(d)(3)(C)(ii), (4)(B), (C), or (E) of this title except in cases where the executive director determines that the sample collected under §290.109(d)(1) and (2) of this title meets the executive director's criteria for invalidation as described in §290.109(e)(1) of this title. A public water system with a groundwater under the direct influence of surface water (GUI) or surface water/groundwater blended source(s), which provides disinfection and filtration, 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.

§290.116(a)(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) of this title 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) of 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) 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.

§290.116(a)(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) 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) 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) 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.

§290.116(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.

§290.116(b)(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) of this title or within 30 days of receiving written notification from the executive director of the identification of a significant deficiency.

§290.116(b)(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.

§290.116(b)(3) Any changes to the approved corrective action plan or schedule must be approved by the executive director.

§290.116(b)(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.

§290.116(b)(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. 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.

§290.116(b)(5)(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.

§290.116(b)(5)(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.

§290.116(b)(5)(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.

§290.116(b)(5)(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.

§290.116(b)(5)(E) Correct all significant deficiencies.

§290.116(b)(5)(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(c)(4)(E) of this title.

§290.116(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 raw groundwater source monitoring, shall meet minimum requirements demonstrating at least 4-log treatment of viruses before the water is distributed to the first connection of the specified groundwater source.

§290.116(c)(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).

§290.116(c)(1)(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.

§290.116(c)(1)(A)(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.

§290.116(c)(1)(A)(ii) The system must resume continuous residual disinfectant monitoring within 14 days.

§290.116(c)(1)(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.

§290.116(c)(1)(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.

§290.116(c)(1)(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.

§290.116(c)(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.

§290.116(c)(2)(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.

§290.116(c)(2)(B) Public water systems shall monitor and record membrane system performance in accordance with executive director specified requirements.

§290.116(c)(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).

§290.116(c)(3)(A) The pH analysis must be conducted using a pH meter with a minimum accuracy of plus or minus 0.1 pH units.

§290.116(c)(3)(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.

§290.116(c)(3)(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.

§290.116(c)(3)(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:

§290.116(c)(3)(D)(i) Amperometric titrator with platinum-platinum electrodes; or

§290.116(c)(3)(D)(ii) Lissamine Green B.

§290.116(c)(3)(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.

§290.116(c)(3)(F) Membrane system integrity monitoring shall be conducted in accordance with executive director specified requirements.

§290.116(c)(4) Recordkeeping requirements for microbial inactivation and removal treatment. Groundwater systems, including wholesale, and consecutive systems, regulated under this subsection must comply with §290.46 of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

§290.116(d) Reporting requirements. Groundwater systems conducting 4-log treatment instead of conducting raw groundwater source monitoring or required 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.

§290.116(d)(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.

§290.116(d)(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) 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.

§290.116(d)(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.

§290.116(d)(4) If a groundwater system is subject to the triggered source monitoring requirements of §290.109(d)(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) of this title within 30 days of the positive distribution coliform sample.

§290.116(d)(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.

§290.116(d)(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.

§290.116(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.

§290.116(e)(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.

§290.116(e)(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.

§290.116(e)(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.

§290.116(e)(4) A groundwater system that fails to conduct the disinfectant or membrane system integrity monitoring required under subsection (c) of this section commits a monitoring violation.

§290.116(e)(5) A groundwater system that fails to report the results of the disinfectant or membrane system integrity monitoring required under subsection (c) of this section commits a reporting violation.

§290.116(e)(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.

§290.116(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).

§290.116(f)(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 groundwater source sample that is not invalidated under §290.109(e)(2) of this title must inform the public served by the water system of the fecal 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.

§290.116(f)(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 groundwater source sample that is not invalidated under §290.109(e)(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:

§290.116(f)(2)(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

§290.116(f)(2)(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).

§290.116(f)(2)(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.

Source Note: The provisions of this §290.116 adopted to be effective January 9, 2008, 33 TexReg 198; amended to be effective November 8, 2012, 37 TexReg 8849; amended to be effective July 30, 2015, 40 TexReg 4769; amended to be effective March 30, 2017, 42 TexReg 1466

§290.117. Regulation of Lead and Copper

§290.117(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.

§290.117(b) Compliance levels and ranges. Community and nontransient, noncommunity systems must meet designated lead and copper levels and water quality parameter ranges.

§290.117(b)(1) Lead and copper action levels. Public water systems must meet action levels for lead and copper in drinking water.

§290.117(b)(1)(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.

§290.117(b)(1)(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.

§290.117(b)(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.

§290.117(b)(2)(A) The reduced monitoring level for lead is 0.005 mg/L.

§290.117(b)(2)(B) The reduced monitoring level for copper is 0.65 mg/L.

§290.117(b)(2)(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.

§290.117(b)(3) Lead and copper Practical Quantitation Levels (PQLs). The PQLs for lead and copper are defined by this paragraph.

§290.117(b)(3)(A) The PQL for lead is 0.005 mg/L.

§290.117(b)(3)(B) The PQL for copper is 0.050 mg/L.

§290.117(b)(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.

§290.117(b)(4)(A) OWQP ranges shall include all elements contained in this subparagraph.

§290.117(b)(4)(A)(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.

§290.117(b)(4)(A)(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.

§290.117(b)(4)(A)(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.

§290.117(b)(4)(A)(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.

§290.117(b)(4)(A)(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.

§290.117(b)(4)(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.

§290.117(b)(4)(C) The executive director shall review and designate OWQPs in writing within six months after receipt of the system's recommended OWQPs.

§290.117(b)(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.

§290.117(b)(5)(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.

§290.117(b)(5)(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.

§290.117(b)(5)(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.

§290.117(b)(5)(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.

§290.117(b)(5)(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.

§290.117(b)(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.

§290.117(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.

§290.117(c)(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).

§290.117(c)(1)(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:"

Table 27: 30 TAC §290.117(c)(1)(A) 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

§290.117(c)(1)(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.

§290.117(c)(1)(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.

§290.117(c)(1)(C)(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:

§290.117(c)(1)(C)(i)(I) 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;

§290.117(c)(1)(C)(i)(II) 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;

§290.117(c)(1)(C)(i)(III) 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

§290.117(c)(1)(C)(i)(IV) 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.

§290.117(c)(1)(C)(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.

§290.117(c)(1)(C)(ii)(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.

§290.117(c)(1)(C)(ii)(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.

§290.117(c)(1)(C)(ii)(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.

§290.117(c)(1)(C)(ii)(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.

§290.117(c)(1)(C)(ii)(V) Supplemental information with Site Selection Form. Systems shall submit supplemental explanatory information as part of the sample site selection documentation.

§290.117(c)(1)(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.

§290.117(c)(1)(D)(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:

§290.117(c)(1)(D)(i)(I) contain copper pipes with lead solder installed after 1982 or contain lead pipes; or

§290.117(c)(1)(D)(i)(II) 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.

§290.117(c)(1)(D)(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:

§290.117(c)(1)(D)(ii)(I) contain copper pipes with lead solder installed after 1982 or contain lead pipes; or

§290.117(c)(1)(D)(ii)(II) are served by a lead service line.

§290.117(c)(1)(D)(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.

§290.117(c)(1)(D)(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.

§290.117(c)(1)(D)(v) Definition of nontransient, noncommunity tier 1 sites. Tier 1 sampling sites selected for a nontransient, noncommunity water system shall consist of buildings that:

§290.117(c)(1)(D)(v)(I) contain copper pipes with lead solder installed after 1982 or contain lead pipes; or

§290.117(c)(1)(D)(v)(II) are served by a lead service line.

§290.117(c)(1)(D)(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.

§290.117(c)(1)(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.

§290.117(c)(1)(E)(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:

§290.117(c)(1)(E)(i)(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

§290.117(c)(1)(E)(i)(II) the system provides water as part of the cost of services provided and does not separately charge for water consumption.

§290.117(c)(1)(E)(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.

§290.117(c)(1)(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.

§290.117(c)(1)(G) Use of same taps each round. A water system must collect tap samples from the same sampling sites in each sampling round.

§290.117(c)(1)(G)(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.

§290.117(c)(1)(G)(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.

§290.117(c)(2) Lead and copper tap sampling frequency. Water systems shall collect at least one sample from the number of sites listed in the table in paragraph (1) of this subsection during each monitoring period. Systems shall sample on the schedule determined by the executive director.

§290.117(c)(2)(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.

§290.117(c)(2)(A)(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.

§290.117(c)(2)(A)(ii) Routine tap sampling. Systems on reduced monitoring may be required to return to routine sampling in two consecutive six-month periods.

§290.117(c)(2)(A)(ii)(I) Systems that exceed the lead action level during any 4-month monitoring period shall return to routine tap sample monitoring.

§290.117(c)(2)(A)(ii)(II) Systems required to perform biweekly water quality parameter (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.

§290.117(c)(2)(A)(ii)(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.

§290.117(c)(2)(A)(ii)(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.

§290.117(c)(2)(A)(ii)(V) Any system that installs corrosion control treatment shall return to routine tap sampling.

§290.117(c)(2)(A)(ii)(VI) Any system that installs source treatment shall return to routine tap sampling.

§290.117(c)(2)(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.

§290.117(c)(2)(B)(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.

§290.117(c)(2)(B)(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.

§290.117(c)(2)(B)(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.

§290.117(c)(2)(B)(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.

§290.117(c)(2)(B)(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.

§290.117(c)(2)(B)(vi) Systems with approved OWQP ranges that operate outside those ranges are not eligible for reduced annual monitoring.

§290.117(c)(2)(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 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.

§290.117(c)(2)(C)(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.

§290.117(c)(2)(C)(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.

§290.117(c)(2)(C)(iii) A system with approved OWQP ranges must operate within those ranges to remain eligible for reduced three-year monitoring.

§290.117(c)(2)(C)(iv) Samples collected once every three years shall be collected no later than every third calendar year.

§290.117(c)(2)(C)(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.

§290.117(c)(2)(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 as described in 40 Code of Federal Regulations §141.86, 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 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.

§290.117(c)(2)(D)(i) Initiation of reduced nine-year tap sampling. The first round of reduced nine-year tap sampling shall be completed no later than nine years after the last time the system monitored for lead and copper at the tap.

§290.117(c)(2)(D)(ii) Materials requirement for reduced nine-year tap sampling. In order to be eligible for reduced nine-year tap sampling, a system must provide the executive director with an updated materials survey certifying that the system meets the requirements of this clause.

§290.117(c)(2)(D)(ii)(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.

§290.117(c)(2)(D)(ii)(II) To qualify for reduced nine-year tap sampling, 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)).

§290.117(c)(2)(D)(ii)(III) To qualify for reduced nine-year tap sampling the water system must provide certification and supporting documentation to the executive director that the system contains no copper pipes or copper service lines.

§290.117(c)(2)(D)(ii)(IV) The executive director shall not issue any "partial waivers" for lead and copper monitoring.

§290.117(c)(2)(D)(iii) Lead and copper levels for reduced nine-year tap sampling eligibility. To qualify for reduced nine-year tap sampling, 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.

§290.117(c)(2)(D)(iv) Conditions for reduced nine-year tap sampling eligibility. As a condition of the reduced nine-year tap sampling schedule, 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, or other activities may be required.

§290.117(c)(2)(D)(v) Reduced nine-year tap sampling revocation. If a water system with a nine-year tap sampling schedule 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 modify the reduced nine-year tap sampling schedule to address changes.

§290.117(c)(2)(D)(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.

§290.117(c)(2)(D)(vii) 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.

§290.117(c)(2)(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.

§290.117(c)(2)(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.

§290.117(c)(2)(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 Tap Sample Sites" under paragraph (1) of this subsection.

§290.117(c)(2)(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.

§290.117(c)(2)(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.

§290.117(c)(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.

§290.117(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 §290.106 of this title (relating to Inorganic Contaminants).

§290.117(d)(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.

§290.117(d)(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.

§290.117(d)(2)(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.

§290.117(d)(2)(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.

§290.117(d)(2)(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.

§290.117(d)(2)(D) Entry point lead and copper sampling frequency after specification of MPLs. A system shall monitor at the frequency specified below.

§290.117(d)(2)(D)(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.

§290.117(d)(2)(D)(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.

§290.117(d)(2)(D)(iii) A water system using only groundwater may sample entry points every ninth year if the system meets one of the following criteria.

§290.117(d)(2)(D)(iii)(I) The entry point lead and copper levels are below the lead and copper MPLs during at least three consecutive compliance periods; or

§290.117(d)(2)(D)(iii)(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.

§290.117(d)(2)(D)(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:

§290.117(d)(2)(D)(iv)(I) The entry point lead and copper levels are below the MPLs for lead and copper for at least three consecutive years; or

§290.117(d)(2)(D)(iv)(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.

§290.117(d)(2)(D)(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.

§290.117(d)(2)(D)(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.

§290.117(d)(2)(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.

§290.117(e) WQP monitoring requirements. Systems shall monitor WQPs to determine the potential for corrosion. 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 subsection, 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.

§290.117(e)(1) WQP monitoring locations. Systems that are required to monitor WQPs shall take two samples at all entry points and distribution WQP sites, as specified in subparagraphs (A) and (B) of this paragraph, where applicable, and at the number of distribution sites shown in Figure: 30 TAC §290.117(e)(1). 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."

Table 28: 30 TAC §290.117(e)(1) 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

§290.117(e)(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.

§290.117(e)(1)(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.

§290.117(e)(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 subparagraphs (A) and (B) of this paragraph.

Table 29: 30 TAC §290.117(e)(2) Initial or Routine Entry Point and Distribution Water Quality Parameter (WQP) 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)WQP sites	Quarterly

[1] Orthophosphate (measured as phosphate-phosphorous (PO4-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.

§290.117(e)(2)(A) Locations for initial and routine WQP monitoring. Systems must conduct WQP monitoring at the locations specified in paragraph (1)(A) and (B) of this subsection, where applicable, and at the number of distribution sites specified in Figure: 30 TAC §290.117(e)(1).

§290.117(e)(2)(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.

§290.117(e)(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). 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.

Table 30: 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]	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]	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 must be measured if alkalinity is adjusted as part of corrosion control.
[3] Inhibitor dosage rates and inhibitor residual concentrations (orthophosphate or silica) must be measured if an inhibitor is used.

§290.117(e)(3)(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.

§290.117(e)(3)(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.

§290.117(e)(3)(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.

§290.117(e)(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).

Table 31: 30 TAC §290.117(e)(4) 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 ranges by the executive director	pH, alkalinity, orthophosphate or silica[1], and calcium[2]	Routine number of distribution sites	Quarterly
	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.

§290.117(e)(4)(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.

§290.117(e)(4)(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.

§290.117(e)(4)(C) The system shall complete follow-up sampling within 36 months after the executive director designates optimal corrosion control treatment.

§290.117(e)(4)(D) Systems shall measure WQPs at every entry point to the distribution system, except as allowed under paragraph (6) of this subsection.

§290.117(e)(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) Entry Point and Distribution Monitoring."

Table 32: 30 TAC §290.117(e)(5) 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[3], or every 3 years[4]
	pH, alkalinity dosage rate and concentration[5], inhibitor dosage rate and inhibitor residual[6]	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] 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.
[4] 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.
[5] Alkalinity must be measured if alkalinity is adjusted as part of corrosion control.
[6] Inhibitor dosage rates and inhibitor residual concentrations (orthophosphate or silica) must be measured if an inhibitor is used.

§290.117(e)(5)(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.

§290.117(e)(5)(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.

§290.117(e)(5)(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.

§290.117(e)(5)(C)(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.

§290.117(e)(5)(C)(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.

§290.117(e)(5)(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.

§290.117(e)(5)(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.

§290.117(e)(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 paragraph (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.

§290.117(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.

§290.117(f)(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.

§290.117(f)(1)(A) Corrosion control studies applicability. Systems that meet the conditions in this subparagraph are required to perform corrosion control studies.

§290.117(f)(1)(A)(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.

§290.117(f)(1)(A)(i)(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.

§290.117(f)(1)(A)(i)(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.

§290.117(f)(1)(A)(i)(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.

§290.117(f)(1)(A)(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.

§290.117(f)(1)(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.

§290.117(f)(1)(B)(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:

§290.117(f)(1)(B)(i)(I) alkalinity and pH adjustment;

§290.117(f)(1)(B)(i)(II) calcium hardness adjustment; and

§290.117(f)(1)(B)(i)(III) 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.

§290.117(f)(1)(B)(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:

§290.117(f)(1)(B)(ii)(I) 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

§290.117(f)(1)(B)(ii)(II) 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.

§290.117(f)(1)(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:

§290.117(f)(1)(C)(i) lead;

§290.117(f)(1)(C)(ii) copper;

§290.117(f)(1)(C)(iii) pH;

§290.117(f)(1)(C)(iv) alkalinity;

§290.117(f)(1)(C)(v) calcium;

§290.117(f)(1)(C)(vi) conductivity;

§290.117(f)(1)(C)(vii) orthophosphate (when an inhibitor containing a phosphate compound is used);

§290.117(f)(1)(C)(viii) silicate (when an inhibitor containing a silicate compound is used); and

§290.117(f)(1)(C)(ix) water temperature.

§290.117(f)(1)(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.

§290.117(f)(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.

§290.117(f)(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.

§290.117(f)(3)(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.

§290.117(f)(3)(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.

§290.117(f)(3)(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.

§290.117(f)(3)(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.

§290.117(f)(3)(D)(i) For systems serving more than 50,000 customers, optimal corrosion control treatment and OWQPs shall be designated within six months of submittal.

§290.117(f)(3)(D)(ii) For systems serving 3,300 to 50,000 customers, optimal corrosion control treatment and OWQPs shall be designated within 18 months of submittal.

§290.117(f)(3)(D)(iii) For systems serving fewer than 3,300, optimal corrosion control treatment and OWQPs shall be designated within 24 months of submittal.

§290.117(f)(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.

§290.117(f)(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.

§290.117(f)(5)(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.

§290.117(f)(5)(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.

§290.117(f)(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.

§290.117(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.

§290.117(g)(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.

§290.117(g)(1)(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.

§290.117(g)(1)(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.

§290.117(g)(1)(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.

§290.117(g)(1)(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.

§290.117(g)(1)(E) The executive director shall notify the system in writing of the determination and will provide the basis for the decision.

§290.117(g)(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.

§290.117(g)(2)(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.

§290.117(g)(2)(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.

§290.117(g)(2)(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.

§290.117(g)(2)(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.

§290.117(g)(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.

§290.117(g)(3)(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.

§290.117(g)(3)(B) The executive director may review the system's data and determine whether the system has properly installed and operated the source water treatment.

§290.117(g)(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.

§290.117(h) Analytical methods, sample collection, and sample invalidation. All methods used for analysis under this section shall be consistent with 40 CFR Part 141, Subpart I, concerning Lead and Copper.

§290.117(h)(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.

§290.117(h)(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 methods prescribed in 40 CFR §141.89.

§290.117(h)(2)(A) The PQLs and the 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.

§290.117(h)(2)(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.

§290.117(h)(2)(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.

§290.117(h)(2)(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.

§290.117(h)(2)(E) First-draw-tap samples must be received in the laboratory within 14 days after the collection date.

§290.117(h)(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:

§290.117(h)(3)(A) The laboratory establishes that improper sample analysis caused erroneous results.

§290.117(h)(3)(B) The executive director determines that the sample was taken from an inappropriate site.

§290.117(h)(3)(C) The sample was damaged in transit.

§290.117(h)(3)(D) The executive director determines that the sample was subject to tampering, as based on substantial documentation.

§290.117(h)(3)(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.

§290.117(h)(3)(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.

§290.117(h)(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.

§290.117(h)(4)(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).

§290.117(h)(4)(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 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 Chapter 25, Subchapter B of this title (relating to Environmental Testing Laboratory Accreditation and Certification).

§290.117(h)(4)(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.

§290.117(i) Reporting. Systems shall report any information required by this section and 40 CFR Part 141, Subpart I to the executive director.

§290.117(i)(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.

§290.117(i)(1)(A) A system shall provide documentation for each tap water lead or copper sample for which the water system requests invalidation.

§290.117(i)(1)(B) The system shall provide the following information to the executive director:

§290.117(i)(1)(B)(i) 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

§290.117(i)(1)(B)(ii) 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.

§290.117(i)(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.

§290.117(i)(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.

§290.117(i)(3)(A) Systems shall report the results of all distribution samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica.

§290.117(i)(3)(B) Systems shall report the results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters.

§290.117(i)(3)(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.

§290.117(i)(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.

§290.117(i)(4)(A) All systems shall submit Materials Survey and Site Selection Forms (TCEQ Form Number 20467) describing the entire system before performing tap sampling.

§290.117(i)(4)(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.

§290.117(i)(4)(B)(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.

§290.117(i)(4)(B)(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.

§290.117(i)(4)(B)(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 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.

§290.117(i)(4)(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.

§290.117(i)(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.

§290.117(i)(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.

§290.117(i)(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.

§290.117(i)(7)(A) Systems demonstrating that they have already optimized corrosion control, must provide all information required in subsection (f) of this section.

§290.117(i)(7)(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).

§290.117(i)(7)(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.

§290.117(i)(7)(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.

§290.117(i)(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.

§290.117(i)(9) Reporting system conditions and facility changes. Systems must report changes of system conditions and facilities that may impact corrosion to the executive director.

§290.117(i)(9)(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.

§290.117(i)(9)(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.

§290.117(i)(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.

§290.117(i)(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.

§290.117(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.

§290.117(j)(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.

§290.117(j)(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).

§290.117(j)(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.

§290.117(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.

§290.117(k)(1) Content of public education materials. Public 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.

§290.117(k)(1)(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."

§290.117(k)(1)(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."

§290.117(k)(1)(C) Sources of lead.

§290.117(k)(1)(C)(i) Explain what lead is.

§290.117(k)(1)(C)(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.

§290.117(k)(1)(C)(iii) Discuss other important sources of lead exposure in addition to drinking water such as lead-based paint or lead-contaminated soils.

§290.117(k)(1)(D) Discuss the steps the consumer can take to reduce their exposure to lead in drinking water.

§290.117(k)(1)(D)(i) Encourage running the water to flush out the lead.

§290.117(k)(1)(D)(ii) Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.

§290.117(k)(1)(D)(iii) Explain that boiling water does not reduce lead levels.

§290.117(k)(1)(D)(iv) Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.

§290.117(k)(1)(D)(v) Suggest that parents have their child's blood tested for lead.

§290.117(k)(1)(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.

§290.117(k)(1) (F) "For more information, call us at {INSERT YOUR SYSTEM's PHONE NUMBER} if applicable) or visit our website at {INSERT YOUR WEBSITE HERE}. For more information on reducing lead exposure around your home or building and the health effects of lead, visit EPA's website at *www.epa.gov/lead* or contact your health care provider."

§290.117(k)(1)(G) In addition to including the elements specified in subparagraphs (A) - (F) of this paragraph, community water systems must:

§290.117(k)(1)(G)(i) tell consumers how to get their water tested, and

§290.117(k)(1)(G)(ii) discuss lead in plumbing components and the difference between low lead and lead free.

§290.117(k)(1)(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.

§290.117(k)(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.

§290.117(k)(2)(A) A community system must directly deliver printed public education materials to all bill paying customers.

§290.117(k)(2)(A)(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.

§290.117(k)(2)(A)(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.

§290.117(k)(2)(A)(ii)(I) Public and private schools or school boards;

§290.117(k)(2)(A)(ii)(II) Women, Infants and Children (WIC) and Head Start programs;

§290.117(k)(2)(A)(ii)(III) Public and private hospitals and medical clinics;

§290.117(k)(2)(A)(ii)(IV) Pediatricians;

§290.117(k)(2)(A)(ii)(V) Family planning clinics; and

§290.117(k)(2)(A)(ii)(VI) Local welfare agencies.

§290.117(k)(2)(A)(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.

§290.117(k)(2)(A)(iii)(I) Licensed childcare centers;

§290.117(k)(2)(A)(iii)(II) Public and private preschools; and

§290.117(k)(2)(A)(iii)(III) Obstetricians-Gynecologists and Midwives.

§290.117(k)(2)(A)(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.

§290.117(k)(2)(A)(iv)(I) Public service announcements;

§290.117(k)(2)(A)(iv)(II) Paid advertisements;

§290.117(k)(2)(A)(iv)(III) Public area information displays;

§290.117(k)(2)(A)(iv)(IV) E-mails to customers;

§290.117(k)(2)(A)(iv)(V) Public meetings;

§290.117(k)(2)(A)(iv)(VI) Household deliveries;

§290.117(k)(2)(A)(iv)(VII) Targeted Individual Customer Contact;

§290.117(k)(2)(A)(iv)(VIII) Direct material distribution to all multi-family homes and institutions; or

§290.117(k)(2)(A)(iv)(IX) Other methods approved by the executive director.

§290.117(k)(2)(A)(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.

§290.117(k)(2)(A)(vi) A community system serving more than 100,000 people must post public education materials on the water system's website.

§290.117(k)(2)(A)(vii) The community system must submit a press release to newspaper, television and radio stations.

§290.117(k)(2)(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:

§290.117(k)(2)(B)(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.

§290.117(k)(2)(B)(ii) The public water system shall implement at least one of the requirements found in subparagraph (A)(iv) of this paragraph.

§290.117(k)(2)(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:

§290.117(k)(2)(C)(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

§290.117(k)(2)(C)(ii) The system provides water as part of the cost of services provided and does not separately charge for water consumption.

§290.117(k)(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.

§290.117(k)(3)(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.

§290.117(k)(3)(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.

§290.117(k)(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.

§290.117(k)(4)(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.

§290.117(k)(4)(A)(i) A community system shall repeat tasks contained in paragraph (2)(A)(v) of this subsection every billing cycle.

§290.117(k)(4)(A)(ii) A community system serving a population greater than 100,000 shall post and retain material on a publicly accessible website.

§290.117(k)(4)(A)(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.

§290.117(k)(4)(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.

§290.117(k)(4)(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.

§290.117(k)(4)(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.

§290.117(k)(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.

§290.117(k)(5)(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.

§290.117(k)(5)(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.

§290.117(k)(5)(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.

§290.117(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.

§290.117(l)(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.

§290.117(l)(1)(A) The 90th percentile lead and copper levels shall be computed as provided in this subparagraph:

§290.117(l)(1)(A)(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.

§290.117(l)(1)(A)(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.

§290.117(l)(1)(A)(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.

§290.117(l)(1)(A)(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.

§290.117(l)(1)(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.

§290.117(l)(1)(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.

§290.117(l)(1)(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.

§290.117(l)(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.

§290.117(l)(2)(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.

§290.117(l)(2)(A)(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.

§290.117(l)(2)(A)(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.

§290.117(l)(2)(A)(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.

§290.117(l)(2)(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.

§290.117(l)(2)(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.

§290.117(l)(2)(D) The executive director may delete results of obvious sampling errors from this calculation.

§290.117(l)(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.

§290.117(l)(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.

§290.117(l)(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.

§290.117(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).

§290.117(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.

Source Note: *The provisions of this §290.117 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective February 19, 2004, 29 TexReg 1373; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective May 15, 2011, 36 TexReg 2860; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.118. Secondary Constituent Levels

§290.118(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.

§290.118(b) Secondary constituent levels. The maximum secondary constituent levels are as follows.

Table 33: 30 TAC §290.118(b) Secondary Standards

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

§290.118(c) Monitoring frequency for secondary constituents. All public water systems shall monitor for secondary constituents at the following frequency.

§290.118(c)(1) Each groundwater source shall be sampled once every three years at the entry point to the distribution system.

§290.118(c)(2) Each surface water source shall be sampled annually at the entry point to the distribution system.

§290.118(c)(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.

§290.118(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.

§290.118(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.

§290.118(f) Compliance determination for secondary constituents. Compliance with the requirements of this subsection shall be based on the following criteria:

§290.118(f)(1) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation;

§290.118(f)(2) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation; and

§290.118(f)(3) A public water system that exceeds the secondary constituent levels in subsection (b) of this section commits a secondary constituents level violation.

§290.118(g) Public notification for secondary constituents. Public notification must be consistent with the requirements of §290.122 of this title (relating to Public Notification).

§290.118(g)(1) Community and nontransient, noncommunity water systems that exceed the secondary 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.

§290.118(g)(2) If a system exceeds the secondary constituent levels, notice must be given to new customers and in the annual Consumer Confidence Report.

Source Note: *The provisions of this §290.118 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.119. Analytical Procedures

§290.119(a) Acceptable laboratories. Samples collected to determine compliance with the requirements of this chapter shall be analyzed at accredited or approved laboratories.

§290.119(a)(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, Subchapter A and B of this title (relating to General Provisions; and Environmental Testing Laboratory Accreditation) using acceptable analytical methods as specified in subsection (b) of this section. These samples include:

§290.119(a)(1)(A) compliance samples for synthetic organic chemicals;

§290.119(a)(1)(B) compliance samples for volatile organic chemicals;

§290.119(a)(1)(C) compliance samples for inorganic contaminants;

§290.119(a)(1)(D) compliance samples for radiological contaminants;

§290.119(a)(1)(E) compliance samples for microbial contaminants;

§290.119(a)(1)(F) compliance samples for total trihalomethanes (TTHM);

§290.119(a)(1)(G) compliance samples for haloacetic acid-group of five (HAA5);

§290.119(a)(1)(H) compliance samples for chlorite;

§290.119(a)(1)(I) compliance samples for bromate; and

§290.119(a)(1)(J) compliance samples for lead and copper.

§290.119(a)(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:

§290.119(a)(2)(A) compliance samples for turbidity treatment technique requirements;

§290.119(a)(2)(B) compliance samples for the chlorine MRDL;

§290.119(a)(2)(C) compliance samples for the chlorine dioxide MRDL;

§290.119(a)(2)(D) compliance samples for the combined chlorine (chloramine) MRDL;

§290.119(a)(2)(E) compliance samples for the disinfection byproduct precursor treatment technique requirements, including alkalinity, total organic carbon, dissolved organic carbon analyses, and specific ultraviolet absorbance;

§290.119(a)(2)(F) samples used to monitor chlorite levels at the point of entry to the distribution system; and

§290.119(a)(2)(G) samples used to determine pH.

§290.119(a)(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.

§290.119(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:

§290.119(b)(1) 40 CFR §141.852(a) and (c) for microbiological analyses;

§290.119(b)(2) 40 CFR §141.74(a)(1) for turbidity analyses;

§290.119(b)(3) 40 CFR §141.23(k) for inorganic analyses;

§290.119(b)(4) 40 CFR §141.24(e) - (g) for organic analyses;

§290.119(b)(5) 40 CFR §141.25 for radionuclide analyses;

§290.119(b)(6) 40 CFR §141.131(a) and (b) for disinfection byproduct methods and analyses;

§290.119(b)(7) 40 CFR §141.131(c) for disinfectant analyses other than ozone, and 40 CFR §141.74(b) for ozone disinfectant;

§290.119(b)(8) 40 CFR §141.131(d) for alkalinity analyses, bromide and magnesium, total organic carbon analyses, dissolved organic carbon analyses, specific ultraviolet absorbance analyses, and pH analyses;

§290.119(b)(9) 40 CFR §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;

§290.119(b)(10) 40 CFR §141.402(c) for groundwater source microbiological analyses; and

§290.119(b)(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.

§290.119(c) The definition of detection contained in 40 CFR §141.151(d) is adopted by reference.

Source Note: The provisions of this §290.119 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective May 15, 2011, 36 TexReg 2860; amended to be effective November 8, 2012, 37 TexReg 8849; amended to be effective March 30, 2017, 42 TexReg 1466

§290.121. Monitoring Plans

§290.121(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.

§290.121(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.

§290.121(b)(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).

§290.121(b)(1)(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.

§290.121(b)(1)(B) Each entry point to the distribution system shall be identified in the monitoring plan as follows:

§290.121(b)(1)(B)(i) a written description of the physical location of each entry point to the distribution system shall be provided; or

§290.121(b)(1)(B)(ii) the location of each entry point shall be indicated clearly on a distribution system or treatment plant schematic.

§290.121(b)(1)(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:

§290.121(b)(1)(C)(i) the location of all pump stations in the distribution system;

§290.121(b)(1)(C)(ii) the location of all ground and elevated storage tanks in the distribution system; and

§290.121(b)(1)(C)(iii) the location of all chemical feed points in the distribution system.

§290.121(b)(1)(D) The system must revise its monitoring plan if changes to a plant or distribution system require changes to the sampling locations.

§290.121(b)(2) The monitoring plan must include a written description of sampling frequency and schedule.

§290.121(b)(2)(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.

§290.121(b)(2)(B) The system must maintain a current record of the sampling schedule.

§290.121(b)(3) The monitoring plan shall include the public water system's Sample Siting Plan as required by §290.109(d)(1) - (6) of this title. The public water system's Sample Siting Plan shall include a list of all microbial distribution compliance monitoring sites as required by §290.109(d) of this title, including all routine and repeat microbial sample sites. As required by §290.109(d)(2)(G) of this title, a public water system that collects more than the minimum number of required routine microbial samples shall include the additional routine sample sites in the public water system's Sample Siting Plan. In addition, a public water system that is required to collect any associated raw groundwater source(s) compliance samples, as required by §290.109(d)(4) of this title, shall include the microbial raw groundwater well compliance sites in the public water system's Sample Siting Plan. 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.

§290.121(b)(4) The monitoring plan must identify the analytical procedures that will be used to perform each of the required analyses.

§290.121(b)(5) The monitoring plan must identify all laboratory facilities that may be used to analyze samples required by this chapter.

§290.121(b)(6) 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.

§290.121(b)(7) The monitoring plan shall include any groundwater source water monitoring plan developed under §290.109(d)(4) of this title to specify well sampling for triggered coliform monitoring.

§290.121(b)(8) 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."

§290.121(b)(9) The monitoring plan shall include any raw surface water monitoring plan required under §290.111 of this title.

§290.121(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.

§290.121(c)(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.

§290.121(c)(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.

§290.121(c)(3) All water systems must provide the executive director with any revisions to the plan upon request.

§290.121(d) Compliance determination. Compliance with the requirements of this section shall be determined using the following criteria.

§290.121(d)(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.

§290.121(d)(2) A public water system that fails to maintain an up-to-date monitoring plan commits a monitoring violation.

§290.121(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 that is issued by the system.

Source Note: *The provisions of this §290.121 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective February 19, 2004, 29 TexReg 1373; amended to be effective December 23, 2004, 29 TexReg 11729; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective May 15, 2011, 36 TexReg 2860; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.122. Public Notification

§290.122(a) Tier 1 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 (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.

§290.122(a)(1) Situations that pose an acute threat to public health include:

§290.122(a)(1)(A) a violation of the *Escherichia coli (E. coli)* MCL as described in §290.109(g)(1)(A) - (D) of this title (relating to Microbial Contaminants);

§290.122(a)(1)(B) an acute turbidity issue at a treatment plant that is treating surface water or groundwater under the direct influence of surface water, specifically:

§290.122(a)(1)(B)(i) a combined filter effluent turbidity level above 5.0 nephelometric turbidity units (NTU);

§290.122(a)(1)(B)(ii) a combined filter effluent turbidity level above 1.0 NTU at a treatment plant using membrane filters;

§290.122(a)(1)(B)(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;

§290.122(a)(1)(B)(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;

§290.122(a)(1)(B)(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

§290.122(a)(1)(B)(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;

§290.122(a)(1)(C) a violation of the MCL for nitrate or nitrite as defined in §290.106(f)(2) of this title (relating to Inorganic Contaminants);

§290.122(a)(1)(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);

§290.122(a)(1)(E) occurrence of a waterborne disease outbreak;

§290.122(a)(1)(F) Detection of *E. coli* or other fecal indicators in source water samples as specified in §290.109(h)(2) of this title, which requires a public notice to be issued within 24 hours of notification of the positive sample;

§290.122(a)(1)(G) other that have the potential to have serious adverse effects as a result of short-term exposure; and

§290.122(a)(1)(H) at the discretion of the executive director, other situations may require a Tier 1 public notice based on a threat to public health.

§290.122(a)(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.

§290.122(a)(2)(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.

§290.122(a)(2)(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.

§290.122(a)(2)(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).

§290.122(a)(2)(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).

§290.122(a)(2)(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.

§290.122(a)(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.

§290.122(a)(3)(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.

§290.122(a)(3)(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.

§290.122(a)(3)(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.

§290.122(a)(4) Copies of all notifications required under this subsection must be submitted to the executive director within ten days of its distribution.

§290.122(b) Tier 2 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.

§290.122(b)(1) Violations that require notification under this subsection include:

§290.122(b)(1)(A) any violation of an MCL, MRDL, or treatment technique not listed under subsection (a) of this section;

§290.122(b)(1)(B) failure to comply with the requirements of any variance or exemption granted under §290.102(d) of this title (relating to General Applicability);

§290.122(b)(1)(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);

§290.122(b)(1)(D) failure to perform any three months of raw surface water monitoring as required by §290.111(b) of this title or request bin classification from the executive director under §290.111(c)(3)(A) of this title;

§290.122(b)(1)(E) other violations or situations deemed by the executive director to have 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; or

§290.122(b)(1)(F) failure of a public water system to conduct Level 1 assessment(s) or Level 2 assessment(s) or failure to complete corrective/expedited action(s) as required by §290.109 of this title or failure of a system to conduct seasonal start-up procedures as required by §290.109 of this title.

§290.122(b)(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.

§290.122(b)(2)(A) The owner or operator of a community water system shall issue the notice by:

§290.122(b)(2)(A)(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

§290.122(b)(2)(A)(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.

§290.122(b)(2)(B) The owner or operator of a noncommunity water system shall issue the notice by:

§290.122(b)(2)(B)(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

§290.122(b)(2)(B)(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).

§290.122(b)(2)(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.

§290.122(b)(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.

§290.122(b)(3)(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.

§290.122(b)(3)(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.

§290.122(c) Tier 3 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.

§290.122(c)(1) Violations or other situations that require notification as described in this section include:

§290.122(c)(1)(A) exceedance of the secondary constituent levels (SCL) for fluoride;

§290.122(c)(1)(B) failure to perform monitoring or reporting required by this subchapter;

§290.122(c)(1)(C) failure to comply with the analytical requirements or testing procedures required by this subchapter;

§290.122(c)(1)(D) operating under a variance or exemption granted under §290.102(b) of this title;

§290.122(c)(1)(E) failure to maintain records on recycle practices as required by §290.46(f)(3)(C)(iii) of this title;

§290.122(c)(1)(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;

§290.122(c)(1)(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;

§290.122(c)(1)(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 documentation of corrective actions required but not yet complete, or other available summary documentation of the sanitary defects and corrective actions taken under §290.109 of this title;

§290.122(c)(1)(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;

§290.122(c)(1)(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;

§290.122(c)(1)(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; and

§290.122(c)(1)(L) failure to maintain records for seasonal start-up procedures and seasonal start-up procedures certification form(s) as required by §290.109 of this title.

§290.122(c)(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. The initial public notice shall be issued in the following manner.

§290.122(c)(2)(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).

§290.122(c)(2)(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).

§290.122(c)(2)(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.

§290.122(c)(2)(C)(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.

§290.122(c)(2)(C)(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).

§290.122(c)(2)(C)(iii) The CCR is distributed following the delivery requirements under §290.274 of this title (relating to Report Delivery and Recordkeeping).

§290.122(c)(2)(D) 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.

§290.122(c)(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.

§290.122(c)(3)(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.

§290.122(c)(3)(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.

§290.122(d) Each public notice must conform to the following general requirements.

§290.122(d)(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.

§290.122(d)(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.

§290.122(d)(3) For notices required under subsections (a), (b), or (c)(1)(A) of this section, the notice must describe potential adverse health effects.

§290.122(d)(3)(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, Subpart Q, Appendix B, in addition to any language required by the executive director. For violations of the condition of a variance or exemption, the notice must contain the health effects information and include the items and schedule milestones of the variance or exemption.

§290.122(d)(3)(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.

§290.122(d)(3)(C) For failure to perform any three 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.

§290.122(d)(3)(D) The notice must describe the population at risk, especially subpopulations particularly vulnerable if exposed to the given contaminant.

§290.122(d)(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.

§290.122(d)(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.

§290.122(d)(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.

§290.122(d)(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.

§290.122(d)(8) The notice shall include a statement to encourage the notice recipient to distribute the public notice to the other persons served. Public water systems must include in their notice the following language: Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

§290.122(d)(9) Systems with variances or exemptions must notify in accordance with 40 CFR §141.205(b).

§290.122(d)(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.

§290.122(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.

§290.122(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 or other method of submission as specified by the executive director. Each proof of public notification must be accompanied with a signed Certificate of Delivery.

§290.122(g) Notice to consecutive systems. 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.

§290.122(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.

§290.122(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.

Source Note: The provisions of this §290.122 adopted to be effective September 13, 2000, 25 TexReg 8880; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective May 16, 2002, 27 TexReg 4127; amended to be effective February 19, 2004, 29 TexReg 1373; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective May 15, 2011, 36 TexReg 2860; amended to be effective November 8, 2012, 37 TexReg 8849; amended to be effective March 30, 2017, 42 TexReg 1466

Subchapter H: Consumer Confidence Reports

§290.271. Purpose and Applicability

§290.271(a) The purpose of the sections in this subchapter is to establish the minimum requirements for the content of annual reports that community water systems must deliver to their customers. These reports must contain information on the quality of the water delivered by the systems and characterize any risk from exposure to contaminants detected in the drinking water in an accurate and understandable manner. This subchapter applies only to community water systems.

§**290.271(b)** Each community water system must provide to its customers an annual report that contains the information specified in this subchapter.

§290.271(c) For the purposes of this section, the term "detected" shall mean the detection of a chemical at any level equal to or greater than the minimum detection level.

Source Note: *The provisions of this §290.271 adopted to be effective August 21, 2000, 25 TexReg 8730; amended to be effective May 15, 2011, 36 TexReg 2860*

§290.272. Content of the Report

§290.272(a) Information on the source of the water delivered must be included in the report.

§290.272(a)(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.

§290.272(a)(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.

§290.272(a)(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.

§290.272(b) The following explanations must be included in the annual report.

§290.272(b)(1) Each report must contain the following definitions.

§290.272(b)(1)(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.

§290.272(b)(1)(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.

§290.272(b)(1)(C) 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.

§290.272(b)(1)(D) 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.

§290.272(b)(1)(E) 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.

§290.272(b)(1)(F) 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.

§290.272(b)(2) The following terms and their descriptions must be included when they appear in the report:

§290.272(b)(2)(A) MFL--million fibers per liter (a measure of asbestos);

§290.272(b)(2)(B) mrem/year--millirems per year (a measure of radiation absorbed by the body);

§290.272(b)(2)(C) NTU--nephelometric turbidity units (a measure of turbidity);

§290.272(b)(2)(D) pCi/L--picocuries per liter (a measure of radioactivity);

§290.272(b)(2)(E) ppb--parts per billion, or micrograms per liter (µg/L);

§290.272(b)(2)(F) ppm--parts per million, or milligrams per liter (mg/L);

§290.272(b)(2)(G) ppq--parts per quadrillion, or picograms per liter (pg/L); and

§290.272(b)(2)(H) ppt--parts per trillion, or nanograms per liter (ng/L).

§290.272(b)(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).

§290.272(b)(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.

§290.272(b)(4)(A) AL--The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

§290.272(b)(4)(B) TT--A required process intended to reduce the level of a contaminant in drinking water.

§290.272(c) Information on detected contaminants.

§290.272(c)(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:

§290.272(c)(1)(A) regulated contaminants subject to an MCL, MRDL, AL, or TT; and

§290.272(c)(1)(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).

§290.272(c)(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.

§290.272(c)(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.

§290.272(c)(4) For detected regulated contaminants listed under §290.275 of this title, the table(s) must contain:

§290.272(c)(4)(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);

§290.272(c)(4)(B) the MCLGs for those contaminants expressed in the same units as the MCLs (as provided for under §290.275 of this title);

§290.272(c)(4)(C) if there is no MCL for a detected contaminant, the TT or specific AL applicable to that contaminant; and

§290.272(c)(4)(D) for contaminants subject to an MCL, except turbidity, total coliform, fecal coliform, and *E. coli* the highest contaminant level used to determine compliance with *National Primary Drinking Water Regulations* (NPDWR) and the range of detected levels.

§290.272(c)(4)(D)(i) For contaminants subject to MCLs, except turbidity, total coliform, fecal coliform, and *E. coli*, 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.

§290.272(c)(4)(D)(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.

§290.272(c)(4)(D)(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.

§290.272(c)(4)(D)(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.

§290.272(c)(4)(D)(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.

§290.272(c)(4)(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.

§290.272(c)(4)(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.

§290.272(c)(4)(G) When *E. coli* is reported, the table(s) shall contain the total number of *E. coli*-positive samples.

§290.272(c)(4)(H) 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.

§290.272(c)(4)(H)(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.

§290.272(c)(4)(H)(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.

§290.272(c)(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."

§290.272(d) Information on *Cryptosporidium*, radon, and other contaminants.

§290.272(d)(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.

§290.272(d)(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.

§290.272(d)(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.

§290.272(d)(4) Community 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).

§290.272(e) Compliance with NPDWR. In addition to the requirements in subsection (c)(4)(H)(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.

§290.272(e)(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.

§290.272(e)(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."

§290.272(e)(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.

§290.272(e)(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.

§290.272(e)(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.

§290.272(e)(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.

§290.272(e)(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 for the calendar year that the IDSE samples were taken.

§290.272(e)(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.

§290.272(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:

§290.272(f)(1) an explanation of the variance or exemption;

§290.272(f)(2) the date on which the variance or exemption was issued and on which it expires;

§290.272(f)(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

§290.272(f)(4) a notice of any opportunity for public input as the review or renewal of the variance or exemption.

§290.272(g) Additional information.

§290.272(g)(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.

§290.272(g)(1)(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.

§290.272(g)(1)(B) Contaminants that may be present in source water include:

§290.272(g)(1)(B)(i) microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife;

§290.272(g)(1)(B)(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;

§290.272(g)(1)(B)(iii) pesticides and herbicides, which might have a variety of sources such as agriculture, urban storm water runoff, and residential uses;

§290.272(g)(1)(B)(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

§290.272(g)(1)(B)(v) radioactive contaminants, which can be naturally occurring or the result of oil and gas production and mining activities.

§290.272(g)(1)(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.

§290.272(g)(1)(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.

§290.272(g)(1)(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.

§290.272(g)(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.

§290.272(g)(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.

§290.272(g)(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.

§290.272(g)(5) The systems may include such additional information for public education consistent with, and not detracting from, the purposes of the report.

§290.272(g)(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.

§290.272(g)(7) Beginning December 1, 2009, any groundwater system that receives notice from a laboratory of a fecal indicator positive groundwater source sample that is not invalidated by the executive director under §290.109(e) of this title (relating to Microbial Contaminants) must inform its customers of any fecal 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:

§290.272(g)(7)(A) the source of the fecal contamination (if the source is known) and the dates of the fecal indicator positive groundwater source samples;

§290.272(g)(7)(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;

§290.272(g)(7)(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

§290.272(g)(7)(D) for a fecal indicator positive groundwater source sample that is not invalidated by the executive director under §290.109(e) of this title, the potential health effects using the health effects language of §290.275(3) of this title.

§290.272(g)(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:

§290.272(g)(8)(A) the nature of the particular significant deficiency and the date the significant deficiency was identified by the executive director;

§290.272(g)(8)(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

§290.272(g)(8)(C) if corrected before the next report, the nature of the significant deficiency, how the deficiency was corrected, and the date of the corrections.

§290.272(g)(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 report the information in subparagraph (A) of this paragraph. In addition to the elements in subparagraph (A) of this paragraph, the public water system shall include the elements in subparagraph (B) of this paragraph when it has a Level 1 treatment technique trigger as specified under §290.109(c)(1) of this title and shall include the elements in subparagraph (C) of this paragraph in the report when it has a Level 2 treatment technique trigger as specified under §290.109(c)(2)(B) of this title. Furthermore, any public water system that failed to complete all the required assessments shall also include the statement in subparagraph (D)(i) of this paragraph. Any public water system that failed to correct all identified sanitary defects shall also include the statement in subparagraph (D)(ii) of this paragraph.

§290.272(g)(9)(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.

§290.272(g)(9)(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.

§290.272(g)(9)(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.

§290.272(g)(9)(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:

§290.272(g)(9)(D)(i) During the past year we failed to conduct all of the required assessment(s).

§290.272(g)(9)(D)(ii) During the past year we failed to correct all identified defects that were found during the assessment.

§290.272(g)(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 report the information in subparagraph (A) of this paragraph. In addition to the elements in subparagraph (A) of this paragraph, the public water system shall include the elements in subparagraph (B) of this paragraph when it has a Level 2 treatment technique trigger as specified under §290.109(c)(2) of this title and shall include the following elements in subparagraph (C) in the report when it has a Level 2 treatment technique trigger as specified under §290.109(c)(2)(A). Furthermore, any public water system that failed to complete all the required assessments shall also include the statement in subparagraph (C)(i) of this paragraph. Any public water system that failed to correct all identified sanitary defects shall also include the statement in subparagraph (C)(ii) of this paragraph.

§290.272(g)(10)(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.

§290.272(g)(10)(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.

§290.272(g)(10)(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:

§290.272(g)(10)(C)(i) We failed to conduct the required assessment.

§290.272(g)(10)(C)(ii) We failed to correct all sanitary defects that were identified during the assessment that we conducted.

§290.272(g)(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:

§290.272(g)(11)(A) We had an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

§290.272(g)(11)(B) We had a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

§290.272(g)(11)(C) We failed to take all required repeat samples following an *E. coli*-positive routine sample.

§290.272(g)(11)(D) We failed to test for *E. coli* when any repeat sample tests positive for total coliform.

§290.272(g)(12) Every report must include the following lead-specific information - a short informational statement about lead in drinking water and its effect on children.

§290.272(g)(12)(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.*"

§290.272(g)(12)(B) A public water system may write its own educational statement, but only in consultation with the executive director.

§290.272(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.

§290.272(i) 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).

Source Note: *The provisions of this §290.272 adopted to be effective August 21, 2000, 25 TexReg 8730; amended to be effective January 6, 2005, 29 TexReg 12212; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective May 15, 2011, 36 TexReg 2860; amended to be effective November 13, 2014, 39 TexReg 8720; amended to be effective March 30, 2017, 42 TexReg 1466*

§290.273. Required Additional Health Information

§290.273(a) All reports must prominently display the following language on the first page of the consumer confidence report or in bold print on the second page of the report: "You may be more vulnerable than the general population to certain microbial contaminants, such as *Cryptosporidium*, in drinking water. Infants, some elderly, or immunocompromised persons such as those undergoing chemotherapy for cancer; those who have undergone organ transplants; those who are undergoing treatment with steroids; and people with HIV/AIDS or other immune system disorders can be particularly at risk from infections. You should seek advice about drinking water from your physician or health care provider. Additional guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* are available from the Safe Drinking Water Hotline at (800) 426-4791."

§290.273(b) A system that detects arsenic levels above 5 micrograms per liter but below the maximum contaminant level (MCL) shall include in its report a short informational statement about arsenic using the following language: "While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems."

§290.273(c) A system that detects nitrate at levels above 5 mg/L, but below the MCL shall include a short informational statement about the impacts of nitrate on children using the following language: "Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask advice from your health care provider."

§290.273(d) Systems collecting 20 or more samples that detect lead above the action level in greater than 5.0% of homes sampled shall include a short informational statement about the special impact of lead on children using the following language: "Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at the homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to two minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline at (800) 426-4791."

§290.273(e) Any water system subject to any or all of subsections (b) - (d) of this section may seek approval from the executive director to write its own alternative educational informational statement.

§290.273(f) Public water systems that detect total trihalomethanes above 0.080 mg/L as a running annual average shall include health effects language provided in §290.275(3) of this title (relating to Appendices A - D), Appendix C, paragraph (81).

Source Note: *The provisions of this §290.273 adopted to be effective August 21, 2000, 25 TexReg 8730; amended to be effective January 6, 2005, 29 TexReg 12212; amended to be effective January 9, 2008, 33 TexReg 198*

§290.274. Report Delivery and Recordkeeping

§290.274(a) Except as provided in subsection (i) of this section, each community water system shall mail or otherwise directly deliver one copy of the report to each bill paying customer by July 1 of each year. Each new community water system shall deliver its first report by July 1 of the year after its first full calendar year in operation and annually thereafter. In addition, each community water system shall provide a copy of the report to each new customer upon request.

§290.274(b) In addition to delivering a report to each customer, the system shall make a good-faith effort to reach consumers who do not get water bills, using means recommended by the executive director. An adequate good-faith effort should be tailored to the consumers who are served by the system but are not bill-paying customers, such as renters or workers. A good-faith effort to reach such consumers should include a mix of methods appropriate to the particular system such as: posting the reports on the Internet; mailing to postal patrons in metropolitan areas; advertising the availability of the report in the news media; publication in a local newspaper; posting in public places such as cafeterias or lunchrooms of public buildings; delivery of multiple copies for distribution for single-billed customers such as apartment buildings or large private employers; and delivery to community organizations.

§290.274(c) Each community water system shall certify to the executive director that the report has been distributed and that the information in the report is correct and consistent with the compliance monitoring data previously submitted to the executive director. This certification and a copy of the report must be mailed to the executive director by July 1 of each year.

§290.274(d) Each community water system shall deliver the report to any other agency or clearinghouse identified by the executive director no later than the date the system is required to distribute the report to its customers.

§290.274(e) Each community water system shall make its report available to the public upon request.

§290.274(f) Each community water system serving 100,000 or more people shall post its current year's report to a publicly accessible site on the Internet.

§290.274(g) Any system providing water to a community water system shall deliver the applicable information required by §290.272 of this title (relating to the Content of the Report) to the receiving systems by April 1 and shall certify to the executive director that the required information has been delivered. This certification must be delivered to the executive director by May 1 of each year.

§290.274(h) Any system subject to this subchapter shall retain copies of its consumer confidence reports for no less than five years.

§290.274(i) The executive director may waive the mailing requirement of subsection (a) of this section for a community water system serving 500 or fewer persons provided that the system

provides notice at least once per year by July 1 to its customers by mail, door-to-door delivery, or by posting in an appropriate location that the report is available upon request.

Source Note: *The provisions of this §290.274 adopted to be effective August 21, 2000, 25 TexReg 8730; amended to be effective January 6, 2005, 29 TexReg 12212*

§290.275. Appendices A–D

The following appendices are integral components of the subchapter.

§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

Table 34: §290.275(1) Appendix A—Converting Maximum Contaminant Level Compliance Values for CCR

Contaminant	MCL in compliance units (mg/L)	multiply by...	MCL in CCR units	MCLG in CCR units
Microbiological Contaminants				
1. Total Coliform Bacteria			TT	0
2. ***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
3. Fecal indicators (enterococci or coliphage)			TT. An uncorrected fecal indicator positive sample at the raw groundwater source is a TT for the Ground Water Rule (GWR).	n/a

Contaminant	MCL in compliance units (mg/L)	multiply by...	MCL in CCR units	MCLG in CCR units
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

Contaminant	MCL in compliance units (mg/L)	multiply by...	MCL in CCR units	MCLG in CCR units
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

Contaminant	MCL in compliance units (mg/L)	multiply by...	MCL in CCR units	MCLG in CCR units
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)	.080	1000	80 ppb	n/a
83. Toluene	1		1 ppm	1
84. Vinyl Chloride	.002	1000	2 ppb	0
85. Xylenes	10		10 ppm	10

§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

Table 35. §290.275(2) Appendix B--Sources of Regulated Contaminants

Contaminant (units)	MCLG	MCL	Major sources in drinking water
Microbiological Contaminants			
1. Total Coliform Bacteria	0	TT	Naturally present in the environment.
2. ***E. coli***	0	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***.	Human and animal fecal waste.
3. Fecal indicators (enterococci or coliphage)	n/a	TT. An uncorrected fecal indicator positive sample at the raw groundwater source is a TT for the Groundwater Rule (GWR).	Human and animal fecal waste.
4. Total organic carbon (ppm)	n/a	TT	Naturally present in the environment.

Contaminant (units)	MCLG	MCL	Major sources in drinking water
5. Turbidity (***Cryptosporidium***)* (***Legionella***)* *Federal and state surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water so that these contaminants are controlled.	n/a (0) (0)	TT (TT) (TT)	Soil runoff. (human and animal fecal waste.) (Found naturally in water; multiplies in heating systems.)
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.

Contaminant (units)	MCLG	MCL	Major sources in drinking water
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.

Contaminant (units)	MCLG	MCL	Major sources in drinking water
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.

Contaminant (units)	MCLG	MCL	Major sources in drinking water
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.

Contaminant (units)	MCLG	MCL	Major sources in drinking water
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.

§290.275(3) Appendix C—Health Effects Language.

Microbiological Contaminants

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(4) Total organic carbon. Total organic carbon (TOC) has no health effects. 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.

§290.275(3)(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

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(14) Beryllium. Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.

§290.275(3)(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.

§290.275(3)(16) Cadmium. Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.

§290.275(3)(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 MRDL could experience stomach discomfort or anemia.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(21) Chromium. Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(26) Mercury (inorganic). Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(39) Dalapon. Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(43) Dinoseb. Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.

§290.275(3)(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.

§290.275(3)(45) Diquat. Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.

§290.275(3)(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.

§290.275(3)(47) Endrin. Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(56) Methoxychlor. Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.

§290.275(3)(57) Oxamyl. Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(60) Picloram. Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.

§290.275(3)(61) Simazine. Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.

§290.275(3)(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

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(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.

§290.275(3)(85) Xylenes. Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

§290.275(4) Appendix D—Unregulated Contaminants.

§290.275(4)(1) Chloroform

§290.275(4)(2) Bromodichloromethane

§290.275(4)(3) Chlorodibromomethane

§290.275(4)(4) Bromoform

§290.275(4)(5) Dibromomethane

§290.275(4)(6) m-Dichlorobenzene

§290.275(4)(7) [Reserved]

§290.275(4)(8) 1,1-Dichloropropene

§290.275(4)(9) 1,1-Dichloroethane

§290.275(4)(10) 1,1,2,2-Tetrachloroethane

§290.275(4)(11) 1,3-Dichloropropane

§290.275(4)(12) Chloromethane

§290.275(4)(13) Bromomethane

§290.275(4)(14) 1,2,3-Trichloropropane

§290.275(4)(15) 1,1,1,2-Tetrachloroethane

§290.275(4)(16) Chloroethane

§290.275(4)(17) 2,2-Dichloropropane

§290.275(4)(18) o-Chlorotoluene

§290.275(4)(19) p-Chlorotoluene

§290.275(4)(20) Bromobenzene

§290.275(4)(21) 1,3-Dichloropropene

Source Note: *The provisions of this §290.275 adopted to be effective August 21, 2000, 25 TexReg 8730; amended to be effective January 6, 2005, 29 TexReg 12212; amended to be effective January 9, 2008, 33 TexReg 198; amended to be effective November 8, 2012, 37 TexReg 8849; amended to be effective March 30, 2017, 42 TexReg 1466*