How to Develop a Monitoring Plan for a Public Water System

Prepared by
Water Supply Division

RG-384
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Submitting a Drinking Water Lab Approval Form

Mailing Address

Electronic Mail

Fax Number

Record Retention

Appendix A. Monitoring Plan Template Instructions

Follow these instructions when filling out the monitoring plan template.

1. Read the introduction and general instructions in the monitoring plan template.

2. Gather the attachments you must submit with the template:

3. Perform necessary research and complete the monitoring plan template. Review your current information through the Drinking Water Watch (DWW) database.

4. If needed, reach out to the TCEQ about additional guidance for completion.

5. Submit the monitoring plan template and necessary attachments.

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Glossary

Terms

Note: More definitions are contained in the Texas regulations (30 TAC 290.38 and 290.103). Read the preface of this guide to learn how to obtain copies of regulations.

Accredited laboratory A laboratory that is NELAC accredited by the TCEQ. For answers to your questions about lab certification, contact the TCEQ Quality Assurance Section at 512-239-5420.

Approved laboratory A laboratory that is approved by the TCEQ. To be approved, the laboratory must submit, and have approved, the Lab Approval Form included in Appendix D of this guide. For answers to your questions about laboratory approval, contact the TCEQ Public Drinking Water Section, at 512-239-4691.

Certified laboratory A laboratory that was certified by the commission to analyze water samples to determine their compliance with maximum allowable constituent levels. For answers to your questions about lab certification, contact the TCEQ Quality Assurance Section at 512-239-5420. Starting June 30, 2008, only labs that are NELAC accredited can be used for analyzing public water system coliform and chemical samples.

Community water system A public water system that has a potential to serve at least 15 residential service connections on a year-round basis, or that serves at least 25 residents on a year-round basis.

Compliance sample A sample that a public water system is required to collect and report to the TCEQ in order to determine compliance with the Drinking Water Standards (30 TAC, Subchapter F: Drinking Water Standards Governing Drinking Water Quality and Reporting Requirement for Public Water Systems).

Demand water source A well, surface source, or purchased-water source that is used on a regular basis, usually annually, to meet peak demand. Demand water sources are included in source water capacity compliance calculations.

Drinking water All water distributed by any agency or individual, public or private, for the purpose of human consumption, or which may be used in the preparation of foods or beverages or for the cleaning of any utensil or article used in the course of preparation or consumption of food or beverages for human beings. The term “drinking water” also includes all water supplied for human consumption or used by any institution catering to the public. In this document, the terms “drinking water,” “potable water,” and “finished water” are used to mean the same thing: water that has been treated in accordance with TCEQ standards and which is delivered to customers for human consumption by public water systems.
Effective contact time (T10)  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).

Emergency source  A well or purchased-water source that is not used on an annual basis, but that is only maintained for use under emergency conditions, such as fire. Emergency water sources are not included in source water capacity compliance calculations.

Entry point  Any point where treated water enters the distribution system. Entry points to the distribution system may include points where chlorinated well water, treated surface water, or water purchased from another supplier enters the distribution system.

Groundwater under the direct influence of surface water (GUI)  Any water beneath the surface of the ground that is subject to surface water intrusion. This may be shown by the presence of insects, macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia* or *Cryptosporidium* [30 TAC 290.38(27)(A)]; by significant and relatively rapid shifts in water characteristics, such as turbidity, temperature, conductivity, or pH, which closely correlate to climatological or surface water conditions [30 TAC 290.38(27)(B)]; or by geological circumstances.

Maximum contaminant level (MCL)  A primary MCL is some health-based level below which the EPA considers water safe to drink. Compliance with MCLs is often not based on the result of a single sample, but instead is calculated. For instance, compliance could be based on whether the average of all samples collected in a year is over the MCL. See “Running annual average.”

Nonregulatory sample  A sample that a water system collects in order to make operational decisions, but that does not have to be reported to the TCEQ.

Non-transient non-community (NTNC) system  A public water system that is not a community water system and regularly serves at least 25 of the same persons at least six months out of the year.

Public water system (PWS)  A system that provides to the public water for human consumption through pipes or other constructed conveyances, which includes all uses described under the definition for drinking water. Such a system must have at least 15 service connections, or serve at least 25 individuals at least 60 days out of the year. This term includes any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control that are used primarily in connection with such system. When two or more systems owned by the same entity are combined to serve more than 25 people at least 60 days out of the year, the combined operation will be considered a public water system. An individual is considered served by a water system if they live, work, or have employees in a place where drinking water is supplied by the system.
**Purchased-water system**  A public water system that purchases (or otherwise receives) at least some portion of its potable water from a different public water system. A purchased-water system that operates as a “distribution-only” system retains responsibility for managing drinking water quality and compliance with Texas rules within the distribution system. When a seller (or provider) takes responsibility for the Texas rules within the purchaser’s distribution system, the TCEQ may merge the two systems under the provider’s PWS ID.

**Running annual average (RAA)**  The average of all sample results collected in the most recent twelve months, four quarters, or one year.

**Sampling site**  The site at which a sample is collected.

**Transient non-community (TNC) system**  A public water system that is not a community water system and serves at least 25 persons at least 60 days out of the year, yet by its characteristics, does not meet the definition of a non-transient non-community (NTNC) water system.

**Wholesaler**  Any public water system that sells or otherwise provides water to another public water system. Two types of wholesalers exist: treated water wholesalers and raw water wholesalers. Both are subject to the Texas regulations.
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 Inspection. 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.texas.gov/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 become 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.

NELAC  National Environmental Laboratory Accreditation

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

**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. Before Sept. 1, 2002, the TCEQ was the Texas Natural Resource Conservation Commission.

**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. The former name of the Texas Commission on Environmental Quality (TCEQ) until 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
Preface

This publication provides guidance on how to comply with Title 30 of the Texas Administrative Code (30 TAC), Chapter 290, Subchapter F: “Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems,” Section 290.121: “Monitoring Plans.”

Monitoring requirements for each constituent are described in this guide, but more detailed information is available in the rules. If there appears to be a discrepancy between this guidance and the rules, follow the rules.

In this guide, the word “you” refers to operators of public water systems. The word “we” refers to the Texas Commission on Environmental Quality (TCEQ), and also to its public drinking water program.

The rules governing this guide were published in the Texas Register on Jan. 4, 2008. We have links to the Secretary of State’s official version of the rules on our website, at <www.tceq.texas.gov/goto/rules>.

What rules apply to public water systems in Texas?

The State of Texas has primacy over the regulation of public drinking water. This means that the Texas Commission on Environmental Quality (TCEQ) implements a Public Water System Supervision (PWSS) program for public water systems in Texas. The TCEQ writes, adopts, and enforces Texas rules that are at least as stringent as the rules promulgated by the United States Environmental Protection Agency (EPA). The Texas rules may be more specific than or worded differently from the EPA rules, so Texas public water systems and their consultants should become familiar with the specific Texas rules.

Public water systems should also be aware of 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 location within the regulations are given below:

**30 TAC, Chapter 290, Subchapter E.** Requirements regarding the Public Health Service (PHS) fees for public water systems. If you have questions about Subchapter E, contact the TCEQ Public Drinking Water Section at 512-239-4691.

**30 TAC, Chapter 290, Subchapter F.** Requirements regarding harmful or potentially harmful constituents for water systems that supply potable water to the citizens of Texas. If you have questions about Subchapter F, contact the TCEQ Public Drinking Water Section at 512-239-4691.

**30 TAC, Chapter 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 TCEQ Public Drinking Water Section at 512-239-4691.
**30 TAC, Chapter 290, Subchapter H.** Rules and regulations for community public water systems related to Consumer Confidence Reports. If you have questions about Subchapter H, contact the TCEQ Public Drinking Water Section at 512-239-4691.

**30 TAC, Chapter 291.** Rules and regulations for water utilities related to requirements for rates, capacity development, and Certificates of Convenience and Necessity. If you have questions about these requirements, contact the Water Utilities Rates and Districts Section at 512-239-4691.

**30 TAC, Chapter 293.** Requirements for water districts. If you have questions about these requirements, contact the Water Utilities Rates and Districts Section at 512-239-4691.

**30 TAC, Chapter 325.** Requirements for licensing of water works operators. The TCEQ's Operator Licensing Division can answer questions about these requirements at 512-239-6133.

**30 TAC, Chapter 30.** Requirements for laboratories used by public water systems. If you have questions about lab certification or accreditation, contact the TCEQ Quality Assurance Section at 512-239-5420.

**Title 2, Texas Water Code, Water Administration, Subtitle D, Chapters 32 and 33.** Requirements for water well drillers. If you have questions about these regulations, call 1-800-803-9202 or 512-463-8876.

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

**Who can answer questions about these rules?**

If you have questions about the rules described in this guidance manual, contact the TCEQ Drinking Water Special Functions Section at 512-239-4691.

**What useful features are in this publication?**

We have included several features to help you use this document:

- A glossary of commonly used abbreviations and acronyms will help you understand which term in these rules corresponds to terms you encounter in related publications.
- Chapter 7 provides examples of monitoring plans for community, non-transient non-community, and transient non-community systems.
- Appendix A provides a brief, one-page generic outline of a monitoring plan.
- Appendices B through F provide outlines that specific types of systems can follow in developing their monitoring plan.

New sections added to the current version of this guide include:

- Section 2.3, which offers recommendations for developing a Source Monitoring Plan for the Ground Water Rule (GWR).
- Section 5.4, which provides guidance for selecting new sampling sites for the Stage 2 Disinfectants and Disinfection Byproducts Rule (DBP2), including guidance for Initial Distribution System Evaluation (IDSE).
How can I get copies of TCEQ 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 the following address: <puborder@tceq.texas.gov>. Be sure to provide your name, address, and the title and number of the publication you are requesting.
- On the Internet, go to the TCEQ home page, at the following address: <www.tceq.texas.gov>; under the Site Navigation bar, follow the links to “Rules,” “Forms,” or “Publications.”

If the item you want is not listed on the website, the TCEQ Publications Unit will help you find it; contact them as shown in the bulleted items above. 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.
Chapter 1. Introduction

Who Must Have a Monitoring Plan?

All public water systems are required to have a monitoring plan. This requirement was expanded in October 2000 in response to the Stage 1 Disinfectants and Disinfection Byproducts Rule (DBP1). Previously, systems were required to keep track of their sample sites and frequency, but were not required to put their sampling documentation together in one document. This guide in its current version is updated to help guide systems through the monitoring plan template and include any necessary attachments where the document in its entirety can be deemed as administratively complete.

If your system treats surface water (SW) or groundwater under the direct influence of surface water (GUI), you must send your monitoring plan to the TCEQ for review and approval. You must revise it and send it in again every time your sample sites or monitoring frequency change. However, if the TCEQ has a full monitoring plan sent within the past three years only the revised section(s) may be sent in.

If your system treats groundwater (GW) or purchases treated water, you must develop a monitoring plan, but you do not have to send it to the TCEQ unless we ask you to. The TCEQ investigator will look at it as part of the comprehensive compliance investigation (CCI, or sanitary survey), and the TCEQ sampling contractor will look at it when they come to collect chemical samples.

If your system purchases water, you need to coordinate with your wholesaler. You must make your monitoring plan available to other systems that provide or receive water from you, as needed. If you employ an operating company, you must give them a copy of your monitoring plan and be sure that they are following it.

When required, you should send your monitoring plan to:

Attn: Monitoring Plan Coordinator
Drinking Water Special Functions Section, Mail Code 155
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087
# Table 1.1. When to Prepare and Send Your Monitoring Plan

<table>
<thead>
<tr>
<th>If your system . . .</th>
<th>You should send your Monitoring Plan to the TCEQ .</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treats surface water (or groundwater under its direct influence)</td>
<td>You should send it to the TCEQ whenever it is revised.</td>
</tr>
<tr>
<td>Treats and/or distributes only groundwater or purchased water</td>
<td>You should send it to the TCEQ if we ask you to.</td>
</tr>
</tbody>
</table>
What Is a Monitoring Plan?

The monitoring plan is a tool to help water system operators coordinate all the monitoring requirements for different chemicals in the plant and distribution system.

It is like an operations and maintenance manual for sampling. The information that must be included in the monitoring plan is information your system should currently have on hand. The first step in developing your system's monitoring plan is gathering the existing documentation you have for sample sites, such as address lists for lead and copper or coliform sampling, maps of your system, etc.

By having an up-to-date monitoring plan, your system can easily refer to sampling requirements and pass this information on to new employees. In addition, the monitoring plan will help your system communicate with the TCEQ and the sampling contractor.

What Does This Guide Cover and What Has Changed?

This guide will help you develop the monitoring plan that every public water system must develop. The first half has general instructions for completing the monitoring plan template and a summary of rule requirements. The second half has appendices with specific outlines and examples for you to follow.

The current version of this guide has been revised based on new regulations. Some of the required tables are formatted differently now. If you followed the 2011 instructions for your monitoring plan, we strongly recommend that you use the new template and update your monitoring plan to follow rules revised since then. As long as your plan includes all of the required information, the TCEQ may approve monitoring plans that follow the old format as being in compliance.

The instructions in this guide are organized in the same order that the monitoring plan template is organized, as follows:

- Chapter 2 includes information in regards to the points of contacts required to be listed in the monitoring plan template.
- Chapter 3 describes all information to include in regards to the physical details that make up the overall system following the flow of water from raw sources to the distribution system.
- Chapter 4 covers all sampling under the Surface Water Treatment Rule (SWTR). Groundwater and purchased-water systems may exclude this section altogether.
- Chapter 5 describes the sampling requirements for the Groundwater Rule (GWR). Surface water and GUI systems may exclude this section.
- Chapter 6 describes sampling requirements for the Revised Total Coliform Rule (RTCR) and disinfectant monitoring to be filled out in the system’s Sample Siting Plan and attached to the monitoring plan.
- Chapter 7 describes inorganic, organic and radionuclide sampling that a TCEQ contractor takes on behalf of the system for compliance purposes. This chapter includes all possible analytes and analyte groups a system may be sampled for dependent upon system type and unique sampling history.
- Chapter 8 describes sampling requirements for the Stage 2 Disinfection Byproducts Rule along with other byproducts formed through the disinfection process. Transient systems may exclude information from this chapter in their monitoring plan as the sampling described does not count toward transient systems’ overall compliance.
- Chapter 9 discusses sampling requirements under the Lead and Copper Rule (LCR). Transient and wholesale systems with no residential connections may exclude information from this chapter in their monitoring plan as the sampling described does not count toward their overall compliance.
- Chapter 10 covers the Lab Approval Form and details information necessary to receive approval from TCEQ. This is required for all systems to submit regardless of source water type, unless the system does not provide any treatment (i.e., a system purchasing water that does not provide additional treatment).

Both the guidance and the monitoring plan cover the full spectrum of water age—from the raw water through the treatment processes to the distribution system.

Follow the guidance provided in the monitoring plan template to determine all rules that apply to your system, as well as those that do not apply to your system. There is a table on page 3 of the template to assist systems in determining which rules may apply to their system based on source water and service type.

The rule requirements summarized in this guidance document and in the template are from 30 TAC, Chapter 290, Subchapter F.

If you have questions about the monitoring plan, the rules that apply to public water systems, or sampling, please call the TCEQ’s Public Drinking Water Section at 512-239-4691 or e-mail <PDWS@tceq.texas.gov>.

**Sources, Plants, Entry Points, and Distribution Systems**

The monitoring plan follows the water through the system, and uses these four items or concepts to track where it is going:

- **Sources.** Sources can be owned or purchased, wells or surface water, potable or raw.
- **Plants.** Anywhere the water quality is changed may be identified as a plant. Every source has to have a plant associated with it, as all raw water must be treated at some point to make it potable.
• **Entry Points.** An entry point is any point at which water from a plant flows to a distribution system. Every entry point must be connected to one or more plants.

• **Distribution System.** A distribution system is where consumers get potable water, and may be broken into pressure planes. Sometimes, a single system will operate separate, disconnected distribution systems.

Figure 1.1 shows some simple, typical arrangements of sources, plants, and entry points. For many systems, these relationships are much more complicated. Therefore, in addition to the lists of sample sites that are still required, we have modified the format of the entry point requirements to better describe how water flows through a system. The table used for this data is called the Entry Point, Plant, and Source Table, and it is described in Chapter 4.
Figure 1.1. Some Typical Combinations of Sources, Plants and Entry Points
You can see the data that the TCEQ has for your system’s sources, plants, and entry points on our website through Drinking Water Watch (DWW) at <dww2.tceq.texas.gov/DWW/>. You can also view any information in regards to points of contact, sampling schedules, sample results, and violations.

A public water system does not always have all four concepts: a source, plant, entry point, and distribution system. In Texas, there are about 1,000 “distribution only” public water systems that purchase and redistribute potable water from a different public water system that does all of the water treatment. There are about 50 treated-water wholesalers that have a source of surface water and a large surface water treatment plant, but do not provide water directly to any retail connections. There are a few raw water wholesalers that only operate wells or surface water intakes. There are systems that operate as “water-haulers,” buying purchased water from one system and transporting it downstream for sale to another system, without providing water directly to any houses or other retail connections. All of these types of systems are regulated by the TCEQ, because a failure in any one area could create a risk to public health, and because that is how the federal rules are structured. They all need some kind of monitoring plan; the complexity of the monitoring plan depends on the complexity of the system.

**Wholesalers and Consecutive Systems (Providers and Receivers)**

Many public water systems buy or sell potable water. Others have interconnections but no sales agreement. The TCEQ rules require that a monitoring plan represent the entire system, including both wholesalers and purchasers.

Therefore, people who have a relationship like this must share monitoring plans as needed.

- **Wholesalers.** The EPA defines wholesalers as public water systems that send any water downstream for redistribution. Some wholesalers do not have their own retail connections, but many do. Wholesalers must provide their receivers with data for CCRs, any required public notices, corrosion control studies, and their monitoring plan, as needed.

- **Consecutive systems.** The EPA defines a consecutive system as a public water system that receives some or all of its finished water from other systems. Thus, any entity that meets the definition of a public water system and is not part of their provider’s monitoring plan is a consecutive system. The other term frequently used for a consecutive system is “purchased-water system.” Consecutive systems must provide their wholesaler(s) with a copy of their monitoring plan, as needed.

**Choosing Sampling Sites**

As you develop your monitoring plan, you may find that certain rules, such as the Revised Total Coliform Rule or the Lead and Copper Rule, contain the possibility of sample locations changing on a regular basis. If changes need to be made, we encourage you to send in the correct forms indicating these changes as soon as
possible and before any future sampling event within that respective program takes place.

Many public water systems are growing. As your system grows, you will need to update your sampling sites to take into account new connections and new sources. When you do this, you may want to check with the TCEQ to make sure you understand the site location requirements. In most cases you are required to notify us when you change sample sites. There are special rules about where sample sites must be located. This guide covers those rules briefly in each chapter. The Public Drinking Water Section can help you figure out where to locate your sampling sites: call us at 512-239-4691, or e-mail us at <PDWS@tceq.texas.gov>.

Should there be a discrepancy between this guidance and the rule, the rule will be used, and not this guidance.
Chapter 2. Public Water System Points of Contact

Fundamental to every public water system is having several key positions to generate organization and stimulate the overall effectiveness of a system. These positions are discussed in the paragraphs below, and the number of unique contacts typically scales in relation to the population served by a particular system. For instance, a large city may have each position filled and even several people helping to fill one role while a small transient system may have one person who runs the entire system. Be sure to notify TCEQ anytime your points of contact change since the agency relies on accurate information when mailing letters, contacting the system with questions, etc. You can see the latest contacts listed for your system through the Drinking Water Watch at <dww2.tceq.texas.gov/DWW/>. Updates to a system’s contact list featuring but not limited to the below contact types can always be sent to the Drinking Water Inventory and Protection Team at <PWSINVEN@tceq.texas.gov>.

Administrative Contact

The most important point of contact to keep up-to-date is the administrative contact. This contact should always be the highest ranking official associated with the public water system, such as a mayor, president or director. All correspondence letters sent by the TCEQ typically go to the administrative contact which is why it is imperative to ensure TCEQ is notified upon any updates in regards to this contact. Though not preferred it is acceptable for one individual to have multiple roles assigned to them, as discussed in the above paragraph, as long as the highest ranking official is the administrative contact the other contact roles can be filled by the person of best fit.

Owner/Legal Contact

Similar to how every system will have an administrative contact, all systems shall also have an individual or entity that legally owns it. The discrepancy will be that the two may not be the same since the owner can be a corporation or association rather than one person. A good example is a city or a business. The legal owner of the city’s water system is simply the city itself while the company, even though only the president may be the administrative contact, is the legal entity responsible for the water system.

Public Water System Contact

The public water system contact, or simply referred to most often as the PWS contact, should be a licensed operator for all community and non-transient non-community systems. Since a transient system does not have to have a licensed operator take samples or operate the system, their PWS contact can simply be someone who TCEQ may contact at any given time. This contact needs to be familiar with all rules and regulations in the event they are contacted with questions about their system.
Chapter 3. Public Water System Details

The specifics detailing water flow in a system, starting with its source of origin (raw water/interconnect) up to the first connection, should be listed in any monitoring plan to assist a system with their sampling locations. Though not all systems add treatment to water flowing within their pipes, they will all have a source of water and at least one entry point that feeds their respective distribution system. More information can be found down below for each respective piece of information requested in the monitoring plan template. Use this brief guidance to assist you in listing accurate information pertinent to the spaces provided in the template. You can view all water system facilities listed for your system through the Drinking Water Watch at <dww2.tceq.texas.gov/DWW/>. Any updates that differ from our database can always be sent to the Drinking Water Inventory and Protection Team at <PWSINVEN@tceq.texas.gov>.

Sources

The three possible source types (wells, surface water intakes and interconnects) are associated with an assigned TCEQ ID once they are activated as an in-use source or have been given approval to use the source by the TCEQ. A source ID is paired with a particular source for an infinite amount of time, meaning the two remain paired even if the source is to become inactive. Any future source of the same type brought online is then given a sequential ID number indefinitely. Examples of listing your sources can be seen in Appendix A located at the end of this guidance. Inactive sources do not have to be listed in your monitoring plan, but if they are be sure to label them as inactive so there is no confusion to whether or not the source is actively contributing to your water system. If you receive water from another water system in any capacity, list the name of the selling system and give details about the meter’s location, type of water, and if the water has been treated beforehand.

Water Treatment

Before it reaches any customers, raw water must be treated with effective disinfectants to protect public health. Not every system will add disinfectant themselves but every system’s water will be treated at some point in the overall life of the water. Wholesaling systems might only sell raw water to customers, leaving the receiving systems to treat the water before it reaches their respective customers. In an opposite scenario, a system may receive treated water and not add any disinfectant if the contract agrees to those terms and the residual proves to hold up throughout their system. All systems need to identify their particular treatment plants, or chlorination facilities, and to which source(s) each plant applies. You can add a treatment plant block if you have more than one plant or treatment injection points. Systems that adhere to the requirements of the Surface Water Treatment Rule (SWTR) should complete this subsection identical to their approved CT study. Though
groundwater and purchased-water systems do not have CT studies the disinfection process should still be listed in sequential order.

**Entry Points**

An entry point of a system can be any location occurring after treatment yet before the first connection within the distribution system. Your entry point(s) are the same location(s) samples are taken from when the TCEQ contractor collects compliance samples for organics, inorganics and radionuclides. Commonly they are on the outside tap of a ground storage tank, at clearwells or the lab sink of a treatment facility. If a system is strictly for wholesale purposes, the entry point is then defined as the take point of the receiving system. Keep in mind that it is very possible for a system to have multiple sources with only one entry point, or one source with multiple entry points. A new entry point needs to be established whenever treated water enters the distribution system at a location not previously used to reach customers.

**Water Storage Facilities**

Systems may utilize storage facilities before and/or throughout the distribution system to aide in water capacity. These facilities can vary in the following medias: ground storage tanks, elevated storage tanks, clearwells, elevated ground storage tanks, standpipes and pressure tanks. Associate each storage facility to its respective contributing source(s) as best you can in the monitoring plan template.

**Distribution System Details**

**Pressure Planes**

Not every system operates more than one pressure plane. The smaller the system, the more likely that there is only one pressure plane.

However, another major factor that plays a part in this determination is change in elevation throughout your distribution system. Pressure planes are hydraulically separate areas of a public water system. Separate areas may exist for various reasons:

- because of geography—like hills or rivers that split the system;
- because separate communities are combined into one system, with one PWS ID; and
- because of major roads or other infrastructure that divides the system; etc.

You can select “No” in the monitoring plan template if you only have one pressure plane. If you have more than one pressure plane, list details about how each plane relates to each entry point and other pressure planes.
**Booster Disinfection**

One common problem larger systems have is the life of their disinfectant residual from an entry point to the ends of their system. Booster disinfection is vital in these systems securing a proper residual in order to protect any connections farther away from an original treatment injection point. List whether the boosting performed contains chloramines or gas chlorine. The order of processes for boosting already treated water should be adding ammonia followed by chlorine – the opposite order when treating raw water.

**Wholesaling**

In the same context as receiving water from another public water system, any system that receives water from your system should be listed in the appropriate section with all pertinent information. All systems fitting this description shall be listed even if it is only for emergency purposes. If this does not apply to your system you can select the appropriate option in the monitoring plan template.
Chapter 4. Surface Water Treatment Rule (SWTR)

Every system is required to have a raw water sampling location for a surface water source, and a sample tap on each well if applicable. These sources and sampling locations must be listed in your monitoring plan.

The Long Term 2 Enhanced Surface Water Treatment Rule (LT2) requires systems that treat surface water (or groundwater under the direct influence of surface water) to complete Cryptosporidium or E. coli monitoring at all raw water intakes. The type of sampling depends on the size of the system.

All water systems that treat surface water are required to collect total organic carbon (TOC) samples from their raw water. The discussion of TOC samples is included later in this Chapter. The raw water TOC sample is collected as part of the TOC sample set that includes a treated water sample.

For surface water (SW) treatment plants and plants treating groundwater under the direct influence of surface water (GUI), the entry point schematic attached to the monitoring plan template must include a description and diagram showing where chemicals are injected and where chemicals or water quality parameters are monitored.

Operational Samples

Most SW or GUI water treatment plants realistically require more samples in the treatment plant than is required by the rules. Keep in mind that the rules are minimum requirements. Most operators recognize the need for additional sampling to determine how well the plant is working. You will need to take additional samples for non-regulatory purposes. You use these sample results to make operational decisions about how to run the treatment process.

You are not required to describe the plant operational sampling in your monitoring plan. That information is included in your operations and maintenance manual. You may choose to include non-regulatory sampling in your monitoring plan, but if you do, you should clearly indicate that it is not for compliance sampling.

Disinfection Zones (30 TAC 290.111)

One of the most important parts of the monitoring plan for surface water treatment plants is the description of the disinfection zones. A disinfection zone is a segment of the treatment process that begins at a disinfectant application point and ends at the next downstream disinfectant application or residual sampling point. Each disinfectant application point, regardless of the frequency of use, represents the beginning of a separate disinfection zone.

The plant’s disinfection zones are described in its concentration-time (CT) study. Every surface water treatment plant is required to have a current, accurate, approved
CT study. If you have questions about CT studies, contact the TCEQ’s Technical Review and Oversight Team at 512-239-4691.

Any system subject to the SWTR is required to perform sampling within each disinfection zone to ensure appropriate disinfectant levels are being maintained. Within each disinfection zone the system must measure the disinfectant residual, pH, temperature, and flow rate of the water at least once a day when peak hourly raw water flow rates occur.

Examples of chemicals a plant may use for treatment include:

- disinfectants (chlorine, chloramine, chlorine dioxide)
- taste and odor control (powdered activated carbon, potassium permanganate)
- coagulants (alum, polymer, ferric)
- pH adjustment (caustic, lime, various acids)
- softening (lime)
- corrosion control (orthophosphates, silicates)
- fluoride

Examples of things that may need to be monitored at the plant include:

- disinfectant residual (for each disinfection zone)
- pH (for each disinfection zone)
- turbidity (combined filter effluent turbidity and individual filter turbidity)
- fluoride residual
- disinfection byproduct precursors (total organic carbon)
- free ammonia (for systems that use chloramines)

**Examples of Treatment Tables for a Plant**

A system that treats water should include a table of treatments in their monitoring plan. A table should be included for each separate treatment plant. Table 4.1 shows the information that must be captured in the treatment table. If the system treats surface water (or GUI), you can expect this table to be long, because it needs to show all chemical addition points and disinfection zones. Table 4.2 gives an example for an average surface water treatment plant.
### Table 4.1. Treatment Table Field Definitions

<table>
<thead>
<tr>
<th>Treatment Sequence</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number the treatments in order of how they are applied to the water. In other words, list the chemicals applied to raw water before those applied to finished water</td>
<td>List the chemical that is added or the physical unit process that is used. You don’t have to list pumps, since those don’t change the drinking water quality. You only need to list storage if it is used for disinfectant contact time (CT).</td>
</tr>
</tbody>
</table>
Table 4.2. Example of a Treatment Table Used at a Surface Water (or GUI) Treatment Plant

<table>
<thead>
<tr>
<th>Disinfection Zone</th>
<th>Treatment Sequence</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Gaseous chlorination (pre)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Activated carbon (powdered)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Alum (coagulant)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Polymer (coagulant aid)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Sedimentation</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Media filtration</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>Gaseous chlorination (post)</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Ammonia injection</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Ground storage tank</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Fluoridation</td>
</tr>
</tbody>
</table>
Plant Schematic

Figure 4.1 is an example of a schematic of the in-plant sampling for a surface water treatment plant. Figure 4.2 shows what a plant schematic may look like if the system utilizes chloramines in the treatment process. Additionally, the monitoring plan should include a schematic that shows how water flows in and out of the system as a whole—not necessarily an actual map, and not necessarily drawn to scale. Figures 4.3 and 4.4 show some acceptable entry point schematics for two different public water system setups: one where water blends together before reaching customers and one where it remains separate entering the distribution system. It is possible to include both formats within one map so long as it includes all information required for the plant schematic. The minimum requirements for what a plant schematic needs to include can be found on page 4 of the monitoring plan template. Figure 4.1. Example of a Plant Schematic for a Surface Water Treatment Plant (SWTP) Showing Pumps, Flow Meters, Injection Points, Sampling Points, and Disinfection Zones.

Figure 4.1. Example of a Plant Schematic for a Surface Water Treatment Plant (SWTP) Showing Pumps, Flow Meters, Injection Points, Sampling Points, and Disinfection Zones
Chemical injection: Chlorine is continuously injected to rapid mix. PAC is injected to rapid mix as needed.

Chemical injection: Chlorine is continuously injected to settled water transfer pipe. Anionic polymer is added as filter aid as needed.

Chemical injection: In summer, chlorine is continuously injected to filtered water.

Raw Sample Site: Raw Tap in Lab: Turbidity, alkalinity, and pH: once every four hours while pumping raw water TOC monthly

D1: Settled Water Sample Site: Weir of Settling Basin: Turbidity and pH: once every four hours while treating water Continuous-line chlorine analyzer: SCADA display in control room

Backwash Lagoon: Decant recycles to head of plant

4 Filters

D2: Filtered Water Sample Sites: Individual turbidimeters on four filters Combined filter effluent: Filtered water tap in lab Continuous on-line chlorine analyzer: Display in control room pH analyzed every 4 hours

Clearwell

D3: Finished Water Sample Site: EP001 Sample Tap in Lab: Turbidity, alkalinity, and pH grab samples every four hours Continuous on-line chlorine analyzer: Display in control room TOC monthly (at same time as source TOC)

Ground Storage

Distribution

D1: Disinfection Zone 1
D2: Disinfection Zone 2
D3: Disinfection Zone 3
Figure 4.2. Example of a Treatment Sequence for Chloramination
Figure 4.3. Distribution Schematic for a PWS with Multiple Sources and One Entry Point to the Distribution System
Figure 4.4. Distribution Schematic for a System with Multiple Sources and More than One Entry Point
Chapter 4 Surface Water Treatment Rule

Combined Filter Effluent Turbidity for SWTPs (30 TAC 290.111)

Every SW and GUI plant (SWTP) must demonstrate that the treatment process removes the required amount of turbidity, which is a surrogate measure for pathogens.

Additional information about surface water monitoring and reporting can be found in Monthly Testing and Reporting at Surface Water Treatment Plants: Using the New Automated Forms (TCEQ publication RG-211). If you have questions about where to locate sampling points, contact the Surface Water Treatment Rule Team at 512-236-4691.

**Location**

Combined filter effluent samples must be taken downstream of the point at which the water from all of the plant’s filters is combined. At most plants, the combined filter effluent sampling site is located where the water enters the clearwell, but it may be downstream of plant storage if it is not possible to monitor before storage. A location after the high-service pumps (but before any customer’s tap) is acceptable if no better sampling location is available. If a plant monitors the combined filter effluent after storage the plant management must notify TCEQ of the CFE monitoring location.

**Frequency**

If your public water system serves fewer than 500 people, you must monitor the turbidity of the combined filter effluent (CFE) at least once each day that the system serves water to the public.

If your water system serves 500 people or more, you must monitor the turbidity of the combined filter effluent at the combined filter effluent sampling points at least every four hours that the system treats water. The four hourly times when CFE readings are to be taken when the plant is online must be specified in the monitoring plan.

Individual Filter Effluent Turbidity for SWTPs (30 TAC 290.111)

Every SW and GUI treatment plant is required to demonstrate that each filter is operating properly. The performance of an individual filter is evaluated based on the turbidity level of that specific filter.

**Location**

SW plants must monitor the turbidity in the water produced by each individual filter.

**Frequency**

The following requirements apply to all individual filters within a plant:

- Systems that use 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 results at least once every five minutes.
• Systems must continuously monitor the filtered water turbidity at the individual filter effluent (IFE) of each filter and record the turbidity value at least every 15 minutes.
• Systems must measure and record the turbidity at the individual filter effluent (IFE) at least once each day the plant is in operation while continuously monitoring the turbidity of the combined filter effluent (CFE) and recording the turbidity value at least every 15 minutes.*

* It is possible for some smaller surface water treatment plants to be allowed to operate without a turbidimeter on each filter - monitoring combined filter effluent in lieu of the individual filter effluent turbidity. The system must meet all five of the provisions set forth in 290.42(d)(11)(E)(ii) which are highlighted below:

1. The public water system operating the plant must serve fewer than 10,000 people including those served through wholesale connections.
2. The plant must have no more than two filters.
3. The filters must have been constructed prior to October 2000.
4. The filters must not have (and may never have had) Individual Filter Effluent (IFE) turbidimeters.
5. The plant must have a combined filter effluent (CFE) turbidimeters installed prior to the clearwell.

**Entry Point Disinfectant Residual (30 TAC 290.110 and 111)**

An entry point is any point where a treated source of water first enters the distribution system. You must have a sample site for every entry point.

The sampling site for the entry point does not have to be at exactly the same location as the entry point itself. What is necessary is that the water collected at the entry point sampling site be representative of the water at the actual entry point. This water should represent what folks are drinking—in terms of materials such as iron or arsenic that don’t decay over time.

There can be some confusion because the sampling site where the entry point sample is collected can vary, depending on the system. For example, the site may be at a wellhead, or it may be at the end of a long transfer pipe, but before the first customer. Entry point samples might be taken at a plant, at a well pump station, at a storage tank, or at clearwells. The sampling site should always be after treatment (and preferably after storage), but before the first connection.

Your existing entry points should already have numbers assigned to them by the TCEQ, and you should already have sampling sites. Entry point numbers are assigned to treated water from a single plant, a well, a well field, a spring, or a purchased-water source that enters at a specific place in distribution.

If you add a new potable water source that feeds into your distribution system separate from any existing location(s), you need a new entry point number assigned by the TCEQ.

Once an entry point number has been assigned, it will apply to that source of water, no matter what happens to the source. If a source of water is abandoned, the entry point number is also deleted.
For example, if you have an old Well 1, called EP001, and you abandon it, the number EP001 will be abandoned also. It is like retiring a football player’s number. If you drill a new well with its own chlorinator, feeding the distribution system at a new point, the new well would be numbered EP002.

Only entry points from operational wells, demand wells, or treatment facilities are required to be monitored. If a well or treatment facility is not used to produce potable water—such as, for example, an irrigation well—you don’t need to sample the water that it produces. You are responsible for ensuring that the TCEQ’s data reflects the correct status of water sources and entry points associated with the public water system under your control.

**Example of Multiple Sources or Plants with One Entry Point**

Sometimes water from multiple wells or water treatment plants blends together before reaching the distribution system. In this case, even though there are multiple sources of water, there is still only one entry point and therefore only one sampling site.

**Example of Entry Point Numbering**

Now, let’s say you have a well and a surface water treatment plant that both feed an entry point that is numbered EP001. If you abandon the well, but not the treatment plant, you should still label that entry point EP001. Even if you then drill a new well, if this new well also feeds entry point EP001, there is still no need to change the monitoring plan.

However, if you connect this new well into the system at a new entry point, the TCEQ will assign the next entry point number—in this case, EP002. You will be communicating with the TCEQ when you add the new well; make sure you get the new entry point number from the TCEQ and update your monitoring plan accordingly.

In any case, you should keep a record of the unused well so that future operators can understand the chain of events.

**Example of Multiple Sources with Multiple Entry Points**

If there are multiple wells or water treatment plants that send water to the distribution system at different places, these are multiple entry points (see Figure 4.3). In this case, a sampling site must be designated for each entry point, and the monitoring plan must include a clear description of the location of each sampling site and which water source it represents. It is important that all sources of water, including purchased water, be identified.

**Frequency**

A SW or GUI system must measure the disinfectant residual at the entry point continuously if it meets either of the two following criteria:

- serves more than 3,300 people
- provides water wholesale (to any number of customers)
A system that serves fewer than 3,300 people (and does not sell water wholesale) must also measure the disinfectant residual, but can do it either continuously or by grab sample. If you are using grab samples, refer to Table 4.3 for the number of grab samples that must be collected as a function of system size.

The samples should be taken at intervals during the time the plant is in operation, not all at the same time. If the residual is low in one sample, you must test at four-hour or shorter intervals until the residual has been restored.
<table>
<thead>
<tr>
<th>If your system serves this many people . . .</th>
<th>Then you must collect this many grab samples per day:</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 or fewer</td>
<td>1</td>
</tr>
<tr>
<td>501 to 1,000</td>
<td>2</td>
</tr>
<tr>
<td>1,001 to 2,500</td>
<td>3</td>
</tr>
<tr>
<td>2,501 to 3,300</td>
<td>4</td>
</tr>
</tbody>
</table>
Sampling for Systems that use Monochloramine

Some systems due to a number of factors utilize monochloramine as a disinfectant, in addition to or as a replacement for free chlorine. If your system uses monochloramine, you should include your Nitrification Action Plan (NAP) as an attachment to your monitoring plan indicating how you ensure that the correct ratio of chlorine to ammonia is applied.

Total Organic Carbon for SWTPs (30 TAC 290.112)

Every SW or GUI plant must comply with the total organic carbon (TOC) monitoring requirements. Only systems that use coagulation, flocculation, and sedimentation followed by conventional media filtration must meet the removal requirements.

If you are required to comply with the TOC rules, you should obtain a copy of the TCEQ publication Total Organic Carbon (TOC) Guidance Manual (RG-379) and use any of the methods described in the preface (page vii) of that publication.

Location

The raw water sampling point should be before any chemical addition. The finished water sampling location may be any point after sedimentation but before the first customer.

Frequency

Your system must take one TOC sample set every month. The monthly TOC sample set consists of raw water alkalinity, raw water TOC, and treated water TOC. The samples should be taken during normal operating conditions and normal influent water quality. The raw water alkalinity and TOC must be taken at the same time (within 5 minutes). The finished water TOC sample must be taken between 1 and 8 hours after the raw water samples were taken. You should only take your TOC sample set when the plant is operating at a steady state. Do not take a TOC sample set directly after changing chemical dosage or water flow rates. Instead, wait at least an hour, until the plant has had a chance to even out.

Actual Contact Time: Your system has the option of sampling finished water at a delay time equal to the actual hydraulic detention time by requesting this option in writing, and explaining the method or equipment you will use to calculate the sampling delay. First, however, you should get approval from the Surface Water Treatment Rule Team, 512-239-4691.

You also have the option of taking additional TOC sample sets in a month. Possible reasons for taking multiple sets include a change in raw water conditions because of rain, or use of a different raw water blend.

Even if you are meeting one of the alternate compliance criteria (ACC), you still have to take a TOC sample set, and maybe some other samples, and report them every month. Table 4.5 gives summaries of the ACCs and their reporting requirements.

If your plant has a running annual average of treated water TOC of less than 2.0 mg/L for two consecutive years, you may reduce monitoring to one TOC sample set per plant per quarter. However, if the running annual average treated water TOC in a
given quarter is greater than or equal to 2.0 mg/L, your system must go back to routine monitoring in the month following that quarter.

For more information on TOC, see the Total Organic Carbon (TOC) Guidance Manual (TCEQ publication RG-379).
### Table 4.5. Alternate Compliance Criteria (ACC) Summaries and Reporting Requirements for Total Organic Carbon

<table>
<thead>
<tr>
<th>ACC</th>
<th>Requirement</th>
<th>Monthly Sampling and Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Raw water TOC &lt; 2.0 mg/L</td>
<td>TOC sample set</td>
</tr>
<tr>
<td>2</td>
<td>Treated water TOC &lt; 2.0 mg/L</td>
<td>TOC sample set</td>
</tr>
<tr>
<td>3</td>
<td>Raw water TOC &lt; 4.0 mg/L</td>
<td>TOC sample set and quarterly TTHM</td>
</tr>
<tr>
<td>4</td>
<td>TTHM &lt; 40 µg/L and HAA5 &lt; 30 µg/L</td>
<td>TOC sample set and use chlorine only</td>
</tr>
<tr>
<td>5</td>
<td>Raw water SUVA &lt; 2.0 mg/L</td>
<td>TOC sample set plus raw water SUVA</td>
</tr>
<tr>
<td>6</td>
<td>Treated water SUVA &lt; 2.0 mg/L</td>
<td>TOC sample set plus treated water SUVA jar test results.</td>
</tr>
<tr>
<td>7</td>
<td>Alkalinity removal &gt; 60 mg/L</td>
<td>TOC sample set and treated water alkalinity.</td>
</tr>
<tr>
<td>8</td>
<td>Magnesium hardness removal &gt; 10 mg/L</td>
<td>TOC sample set and raw and treated magnesium.</td>
</tr>
</tbody>
</table>
Long Term 2 Enhanced Surface Water Treatment Rule (LT2) Requirements (30 TAC 290.111)

The EPA published the LT2 rule in the Federal Register on Jan. 5, 2006. The TCEQ adopted the LT2 rule on Jan. 4, 2008. The LT2 rule applies to all public water systems (PWSs) that treat surface water (SW) or groundwater under the direct influence of surface water (GUI). These systems are required to monitor all raw water intakes for Cryptosporidium parvum or E. coli. The results of the sampling will determine if the source water has an elevated risk of Cryptosporidium. If elevated Cryptosporidium levels are found, a system is required to install additional treatment to reduce the risk of sickness from Cryptosporidium.

A system that treats SW or GUI must conduct at least two rounds of raw surface water monitoring at each SW intake and at each GUI well. The purpose of the monitoring is to establish minimum treatment technique requirements for Cryptosporidium and other pathogens. The TCEQ 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.

Determining Raw Surface Water System Schedules for Existing Sources

Systems will undertake two rounds of sampling. Scheduling for the LT2 requirements is based on the size of the system or the combined distribution system (CDS). A CDS is an interconnected group of systems. (Groups are based on the population of the largest single system in the CDS, not on the sum of the populations of the interconnected systems.)

Table 4.1 is the raw source water monitoring schedule for SW and GUI systems. This table contains the start dates for both rounds of sampling, which are based on the number of people served within a single system or CDS, if applicable (designated by the Schedule Number).
Table 4.6. Raw Source Water Monitoring Schedule for SW and GUI Systems

<table>
<thead>
<tr>
<th>Schedule Number</th>
<th>Systems that are not part of a combined distribution system(^1) and serve . . .</th>
<th>. . . must begin the 1st round of source water monitoring no later than the month beginning . . .</th>
<th>. . . and must begin the 2nd round of source water monitoring no later than the month beginning . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>at least 100,000 people</td>
<td>October 1, 2006</td>
<td>April 1, 2015</td>
</tr>
<tr>
<td>2</td>
<td>from 50,000 to 99,999 people</td>
<td>April 1, 2007</td>
<td>October 1, 2015</td>
</tr>
<tr>
<td>3</td>
<td>from 10,000 to 49,999 people</td>
<td>April 1, 2008</td>
<td>October 1, 2016</td>
</tr>
<tr>
<td>4</td>
<td>fewer than 10,000 people and monitor for <em>E. coli</em></td>
<td>October 1, 2008</td>
<td>October 1, 2017</td>
</tr>
<tr>
<td></td>
<td>fewer than 10,000 people and monitor for <em>Cryptosporidium</em></td>
<td>April 1, 2010</td>
<td>April 1, 2019</td>
</tr>
</tbody>
</table>

1. Systems that provide treated surface water to another system and are part of a combined distribution system (CDS) must begin monitoring at the same time as the system in the CDS with the earliest compliance date.
**Determining Raw SW System Schedules for New Sources**

If a system installs a new well or intake after the date that the first round of raw source water monitoring begins, the system must submit a proposed monitoring schedule. This schedule for the first round of raw surface water monitoring must be submitted no later than three months after the new source is placed in operation.

**Raw Surface Water Sampling Plan**

A system must submit a proposed raw surface water monitoring plan when requested by the TCEQ. Each system receives a package of information from the TCEQ that must be completed and returned before the due date for the sampling plan. The sampling plan must do all of the following:

- 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
- state the frequency and dates that samples will be collected
- specify the laboratories that will perform the analyses

Surface water 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. You should submit the drawing from the system’s monitoring plan.

**Raw Surface Water Sampling Frequency**

You must also submit a detailed schedule of when the samples will be taken. The frequency and length of sampling depends on the size of the system.

Systems in Schedules 1 to 3 must monitor turbidity, E. coli levels, and Cryptosporidium levels in the raw water at least once a month for a period of not less than 24 consecutive months. Schedule 4 systems that choose to not monitor for E. coli will be required to monitor for Cryptosporidium. Schedule 4 systems that choose to monitor for E. coli must take samples at least once every two weeks for a period of not less than 12 consecutive months (26 samples total). If E. coli levels do not exceed triggers, these Schedule 4 systems will not be required to monitor for Cryptosporidium.

If E. coli levels exceed triggers, these Schedule 4 systems can choose to monitor for Cryptosporidium either twice a month for one year or once a month for two years.

The method of coliform monitoring for Total Coliform Rule compliance is different from this method.
Chapter 5. Groundwater Rule (GWR)

Every system is required to have a raw water sample tap on each well per §290.41(c)(3)(M). Each source and sampling location must be listed in your monitoring plan even if used for only emergency or seasonal purposes.

Some water systems are required to take monthly coliform samples of their raw water. The Groundwater Rule (GWR) requires all public water systems (PWS) to perform raw water sampling following any positive routine distribution system coliform sample. If a system develops a Triggered Source Monitoring Plan (TSMP) describing the sources that feed each distribution sample site, and gets it approved by the TCEQ, then the follow-up monitoring can be limited to the well(s) feeding that distribution site. The TSMP can also identify representative wells if the system contains multiple wells in close proximity and constructed in a similar manner (i.e. well depth, annular cementing, screen location, etc.).

Groundwater Rule Requirements

The Groundwater Rule applies to all public water systems, including transient non-community (TNC) water systems as well as community and non-transient non-community (NTNCS) systems that provide groundwater.

Under the rule, when a PWS collects a total coliform positive result in any routine distribution system sample, you must sample every well feeding that distribution system within 24 hours and have them analyzed for total coliform and E. coli bacteria. Triggered Source Monitoring (TSM) is a one-to-one relationship between routine distribution positive samples and required raw well TSM samples. All wells that were in use at the time of the distribution system positive sample must be sampled for each routine distribution positive. If a well was not in use at the time of the routine distribution positive sample then you do not have to sample that well but you must provide documentation to TCEQ, such as a well production log, so that well will not be scheduled for the required TSM. This includes purchased-water sources. Your monitoring plan must include contact information for any systems that supply you with potable water for redistribution to ensure this information is readily available.

However, sampling can be limited to fewer wells if you have a TCEQ-approved TSMP [290.109(c)(4)(B)(ii)]. For more information on submitting a TSMP, contact the Groundwater Rule Team at 512-239-4691 or go to the GWR information posted at <www.tceq.texas.gov/goto/gwrule>.

Wells Not Continuously Used

Sometimes, a system that has several wells will not use all the wells all the time. For example, in Figure 5.1, the well that feeds EP 002 is not always connected to the distribution system. The monitoring and sampling requirements for this well depend on whether it is an emergency well or a demand well. (See the glossary at the beginning of this guide, for definitions of demand water source, emergency water
source, and other terms.) You may choose to not monitor emergency water sources; however, demand sources must be included in your routine monitoring plan.
Figure 5.1. Distribution Schematic for a System with Wells that Are Not Continuously Used

Source Activity: Wells and other sources can be called Operational, Demand, Emergency, or Test depending on how frequently they are used. Check the definitions to make sure your sources are defined correctly.
New Wells

Before a new well can be approved to provide water to the public, coliform and chemical samples must be collected to make sure the well provides water that meets the drinking water standards. Call the TCEQ’s Plans Review Team at 512-239-4691 to learn about design or construction requirements for new drinking water wells. Call the TCEQ’s Drinking Water Quality Team at 512-239-4691 or e-mail <PDWS@tceq.texas.gov> to learn about sampling requirements for new wells.

Triggered Source Monitoring

Under some circumstances, the TCEQ may require a system to have a Triggered Source Monitoring Plan. If approved by the TCEQ, systems with more than one groundwater source may conduct triggered source monitoring at a representative groundwater source or sources. This can save time and money for the system in the long term.

Before using a Triggered Source Monitoring Plan, you must submit it to the TCEQ for approval. You should use this guidance to ensure we have all the required information. When you receive written approval for your Triggered Source Monitoring Plan, keep it on file with your system’s monitoring plan.

There are two categories of representative source water monitoring for the GWR:

1. Wells representing coliform monitoring locations in the distribution system.
2. Wells representing other wells within the same hydrogeologic setting.

How Distribution Sites Link to Wells

Table 5.1 shows the requirements for the Triggered Source Monitoring Plan table of distribution sites and sources. Table 5.2 shows an example of a list of sites and sources. Figure 5.2 shows an example of a distribution map.
### Table 5.1. Requirements for a Distribution Sites and Sources Link Table

<table>
<thead>
<tr>
<th>Routine Distribution Coliform Sample</th>
<th>Entry Points that Feed Each Site</th>
<th>Wells Feeding Each Entry Point</th>
<th>TCEQ Source ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>List all routine distribution coliform sites. This list should already be in your monitoring plan under the “Distribution” section. If the sites are numbered, include the numbers also.</td>
<td>List any entry points that feed each routine distribution coliform site. If that changes under different operating conditions, list all the entry points that feed that part of the system. If you know that a site gets water from a different entry point in the summer and winter, note that.</td>
<td>List all the wells feed each entry point Include emergency and demand wells.</td>
<td>List the TCEQ Source ID for each well</td>
</tr>
</tbody>
</table>
### Table 5.2. Example of Triggered Source Monitoring Plan Distribution Sites and Corresponding Well Sources Table

<table>
<thead>
<tr>
<th>Routine Distribution</th>
<th>Entry Point Feeding</th>
<th>Wells Feeding</th>
<th>TCEQ Source ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 City Hall</td>
<td>EP001</td>
<td>Well 1 (emergency),</td>
<td>G1019999A</td>
</tr>
<tr>
<td>2 Fire Department</td>
<td></td>
<td></td>
<td>G1019999B</td>
</tr>
<tr>
<td>3 123 Apple Street</td>
<td>EP002</td>
<td>Well 3</td>
<td>G1019999C</td>
</tr>
<tr>
<td>4 15401 Querca Street</td>
<td>EP002</td>
<td>Well 4</td>
<td>G1019999D</td>
</tr>
<tr>
<td>5 20 Industrial Park Road</td>
<td>EP003</td>
<td>Well 4</td>
<td>G1019999D</td>
</tr>
<tr>
<td>6 456 Fleet Street (Operator’s)</td>
<td>EP001</td>
<td>Well 1 (emergency),</td>
<td>G1019999 9A,</td>
</tr>
</tbody>
</table>
### Table 5.3. Example of Triggered Source Monitoring Plan
Distribution Sites and Corresponding Well Sources Table for
Figure 5.6, a Community PWS with Two Wells and Seven
Coliform Sites

<table>
<thead>
<tr>
<th>Routine Distribution Coliform Sample Site</th>
<th>Well / EP</th>
<th>Summer Well 1 (demand)</th>
<th>Winter Well 2 Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS-A Sample Station at 765 FM 4691</td>
<td>Well 1 / Entry Point 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS-B Hose bibb at NE corner of Court House</td>
<td>Well 2 / Entry Point 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS-C Sample Station at High School (Bldg 4)</td>
<td>Well 2 / Entry Point 2</td>
<td></td>
<td>Well 2 / Entry Point 2</td>
</tr>
<tr>
<td>SS-D Hose bibb at SW corner of Middle School</td>
<td>Well 1 / Entry Point 1 or Well 2 / Entry Point 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS-E Sample Station at 987 S East Avenue</td>
<td>Well 2 / Entry Point 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS-F (alt) Hose bibb at back of roadhouse</td>
<td>Well 1 / Entry Point 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS-G (alt) Hose bibb on side of church</td>
<td>Well 2 / Entry Point 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 5.2. Diagram of the Distribution Site and Source Relationship
Representative Wells

The Triggered Source Monitoring Plan describes any groups of wells that are hydrogeologically similar enough that a sample from one well can represent the whole group. You must provide justification and documentation showing hydrogeologic similarity if you wish to limit follow-up raw well sampling by identifying representative wells. It is only needed if you wish to limit sampling to one well out of a group of wells. If you only have a few wells, you may not need to include this section.

When wells are hydrogeologically similar, they are drawing water from parts of the aquifer that are interconnected and the water that they produce is expected to be comparable. It should be possible to get a sample from one well that reasonably represents water from all the wells if the wells are within close proximity. So, if one well is free of fecal contamination, you can deduce that all the wells are also free of fecal contamination.

Table 5.4 describes the requirements for a representative well group table.

Examples of representative well group tables are given below. Table 5.5 is an example of a representative well table for a single group of two wells, while Table 5.6 is an example of a table for two groups of four wells. Figure 5.3 is a diagram depicting the relationships described in Table 5.6.
### Table 5.4. Requirements for a Representative Well Group Table

<table>
<thead>
<tr>
<th>Well Proposed to Be Sampled as</th>
<th>Back up Well</th>
<th>Source IDs of Wells</th>
<th>Name s of Wells</th>
<th>Aquifer / Well Depth /</th>
<th>Entry Point(s) Associate</th>
</tr>
</thead>
<tbody>
<tr>
<td>The well that you propose to sample as representative of the group of wells</td>
<td>Well to be sampled if primary representative well is</td>
<td>TCEQ source IDs for wells are proposed to be by the well in the first column.</td>
<td>System’s name for</td>
<td>Aquifer that those wells draw water from / depth of well well output / gpm.</td>
<td>Usually a of wells will the same point, but not always</td>
</tr>
</tbody>
</table>
# Table 5.5. Example of a Representative Well Table (for One Group with Two Wells)

<table>
<thead>
<tr>
<th>Representative Well</th>
<th>Backup Rep Well</th>
<th>Source IDs of Wells</th>
<th>Names of Wells</th>
<th>Aquifer / Well Depth /</th>
<th>Entry Point(s) Associate</th>
</tr>
</thead>
<tbody>
<tr>
<td>G10199999A</td>
<td>G1019999B</td>
<td>G1019999A</td>
<td>Well 1</td>
<td>Chicot / 280’/ 45</td>
<td>EP001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G1019999B</td>
<td>Well 2</td>
<td>Chicot / 300’/ 50</td>
<td></td>
</tr>
<tr>
<td>Representative Well ID</td>
<td>Backup Rep Well ID</td>
<td>Source IDs of Wells</td>
<td>Name of Wells Represented</td>
<td>Aquifer / Well Depth / Well GPM</td>
<td>Entry Point(s) Associated with</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------</td>
<td>---------------------</td>
<td>---------------------------</td>
<td>---------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>G2550001A</td>
<td>G2550001B</td>
<td>G2550001A</td>
<td>Well 1</td>
<td>Glen Rose / 1233’ / 115</td>
<td>EP001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G2550001B</td>
<td>Well 2</td>
<td>Glen Rose / 1200’ / 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>G2550001C</td>
<td>Well 3</td>
<td>Glen Rose / 1188’ /</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>G2550001D</td>
<td>Well 4</td>
<td>Glen Rose / 1046’ /</td>
<td></td>
</tr>
<tr>
<td>G2550001D</td>
<td>G2550001E</td>
<td>G2550001E</td>
<td>Well 5</td>
<td>Trinity / 541’ / 76</td>
<td>EP002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G2550001F</td>
<td>Well 6</td>
<td>Trinity / 540’ / 80</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>G2550001G</td>
<td>Well 7</td>
<td>Trinity / 555’ / 45</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>G2550001H</td>
<td>Well 8</td>
<td>Trinity / 539’ / 50</td>
<td></td>
</tr>
</tbody>
</table>
Figure 5.3. Diagram of Representative Wells
Interconnections with Other Groundwater Systems

Part of the Triggered Source Monitoring Plan is a description of interconnections with other systems that have wells. This section of the plan should describe which purchased-water interconnections provide water to each part of your distribution.

The Triggered Source Monitoring Plan should include contact information and maps or geographically representative schematics showing which wells provide water, and which wells will be sampled depending on the location of a coliform positive sample in your distribution system.

Triggered Source Monitoring Plan Requirements

For assistance in submitting a Triggered Source Monitoring Plan, contact the Groundwater Rule Team at 512-239-4691 or go to the GWR monitoring provisions online at <www.tceq.texas.gov/goto/gwrule>. For information on what to include in a Triggered Source Monitoring Plan, download the appropriate checklist(s):

- Checklist D: Wells Representing Coliform Monitoring Locations in the Distribution System
- Checklist H: Wells Representative of Other Wells in the Same Hydrogeological Setting

Assessment Source Monitoring

Currently, systems with wells that have been identified in aquifers that are sensitive to surface water intrusion, or are vulnerable in some other way, may be required to collect monthly raw water samples and have them analyzed for E. coli and total coliform bacteria. If your system is required to conduct monthly raw water coliform monitoring, you should list all of these sources along with the associated rule exceptions in your monitoring plan. You should keep a copy of the letter that requires this sampling—for example, a sanitary control easement exception letter.

Plant Schematic

Figure 5.4 is an example of a schematic (or diagram) for a groundwater system that uses reverse osmosis to remove a chemical contaminant. Figure 5.5 is an example of a schematic including all sources of water even if one source may only be for emergency purposes. Figure 5.6 shows an example of a schematic for a groundwater system that contains multiple sources.

Groundwater and purchased-water systems are required to maintain a disinfectant residual, but are not required to monitor at the entry point. Therefore, while not for compliance purposes, it is still highly recommended to sample the disinfectant residual at any entry point.
Figure 5.4. Example of a Plant Schematic for a Groundwater System Using Reverse Osmosis (RO) to Remove Chemical Contaminants
Figure 5.5. Distribution Schematic for a System with Wells that Are Not Continuously Used

Figure 5.6. Simple Schematic for a System with Seven Wells

McCormick WSC 1234567
John County; CCN: 12345

IMA Operator 6/27/03
Chapter 6. Revised Total Coliform Rule (RTCR) and Disinfectant Residual

Bacteriological samples, usually called coliform samples, are the samples most people think of when they think of distribution system samples. Remember, you must measure the disinfectant residual (free chlorine or chloramines) every time you take a coliform sample. For more information about the Revised Total Coliform Rule (RTCR) monitoring requirements, please see the TCEQ’s publication Coliform Sampling for Public Water Systems (RG-421).

These TCR requirements apply to all public water systems, including transient non-community (TNC) systems.

Applicability

All public water systems that operate a distribution system have sampling requirements. If you have a distribution system, but you do not treat water, you still have to sample unless you only wholesale raw water. The majority of water systems must check the disinfectant residual and microbial quality in their system because of the risk of sanitary defects occurring within the water supply and possible health risks to those consuming the water.

Samples are collected in the distribution system for constituents that change as the water flows through the pipes. For instance, chlorine is used up as it disinfects (by killing microorganisms).

Frequency

The minimum sampling frequency for public water systems, depending on your population, is shown in Table 6.1, below. The population of non-community (NTNC or TNC) systems must be based on the maximum number of persons served on any given day during the month. The population of community systems will be based on the data reported during the most recent comprehensive compliance investigation (CCI) of the public water system.

The population should reflect the actual current number of meters and/or census of the system, modified to account for growth.

The samples must be physically taken in the month that is the reporting period. For example, samples taken in May cannot be used for June reporting or vice versa.
<table>
<thead>
<tr>
<th>If your system serves this many people</th>
<th>Then you must collect at least this</th>
<th>And your sampling events must occur at least this frequently:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 1,000</td>
<td>1</td>
<td>Once each month, rotating through up to 5 representative sampling</td>
</tr>
<tr>
<td>1,001 to 2,500</td>
<td>2</td>
<td>Once a month—or twice a month at regular intervals—rotating through 5</td>
</tr>
<tr>
<td>2,501 to 3,300</td>
<td>3</td>
<td>Twice a month at regular</td>
</tr>
<tr>
<td>3,301 to 4,100</td>
<td>4</td>
<td>3 times a month at regular</td>
</tr>
<tr>
<td>4,901 to 5,800</td>
<td>6</td>
<td>4 times a month at regular</td>
</tr>
<tr>
<td>5,801 to 6,700</td>
<td>7</td>
<td>Daily.</td>
</tr>
<tr>
<td>6,701 to 7,600</td>
<td>8</td>
<td>If you have any questions about the TCEQ's interpretation of &quot;daily sampling,&quot; call the Public Drinking Water Section at 512-239-4691 and ask for</td>
</tr>
<tr>
<td>7,601 to 8,500</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>8,501 to 12,900</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>12,901 to 17,200</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>17,201 to 21,500</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>21,501 to 25,000</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>25,001 to 33,000</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>33,001 to 41,000</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>41,001 to 50,000</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>50,001 to 58,000</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>58,001 to 70,000</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>70,001 to 83,000</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>83,001 to 96,000</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>130,001 to 220,000</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>220,001 to 320,000</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>320,001 to 450,000</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>450,001 to 600,000</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>600,001 to 780,000</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>780,001 to 970,000</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>970,001 to 1,230,000</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>1,230,001 to 1,520,000</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>1,520,001 to 1,850,000</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>1,850,001 to 2,270,000</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>2,270,001 to 3,020,000</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>3,020,001 to 3,960,000</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>3,960,001 or more</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>3,960,001 or more</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>3,960,001 or more</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>3,960,001 or more</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>3,960,001 or more</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>3,960,001 or more</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>3,960,001 or more</td>
<td>95</td>
<td></td>
</tr>
</tbody>
</table>
**Location**

Samples for microbial quality must be collected at active service connections or locations adjacent to active connections. The set of sampling locations must be representative of the whole distribution system, and you must sample each location regularly. If you take fewer than five samples at a time, don’t use the same location each time. Instead, rotate through your full set of sampling locations.

Every public water system should already have a list of coliform sampling sites that can be used as part of the monitoring plan. You should also identify locations upstream and downstream to be used to collect repeat samples if a routine sample result is positive or “coliform-found.”

<table>
<thead>
<tr>
<th>If your system serves this</th>
<th>Then you must collect at least this many coliform</th>
<th>And you must have at least this many routine distribution coliform</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–4,900</td>
<td>1–5</td>
<td>5 (sample each location regularly)</td>
</tr>
<tr>
<td>4,901–33,000</td>
<td>6–30</td>
<td>1 site per sample—for example, if you collect 6 samples, then you must have at least 6 sample sites</td>
</tr>
<tr>
<td>33,001–50,000</td>
<td>40–50</td>
<td>At least 30 sites</td>
</tr>
<tr>
<td>50,001 or more</td>
<td>60–480</td>
<td>Half the number of samples—for example, if you collect 210 samples, then you must have at least 105 sample sites</td>
</tr>
</tbody>
</table>

1. This is the minimum required number of sample sites; however, you may designate more if you want. The sample sites must represent the whole distribution system. And you must identify sites upstream and downstream of each routine sample site for collection of repeat samples.

The system must collect no fewer than three repeat samples for each total coliform-positive sample found. The three repeat samples are referred to as a “Repeat Sample Set”.

Systems must collect at least one repeat sample from the sampling tap where the original total coliform positive sample was collected, at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system, the system must still take all required repeat samples. A system may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a standard operating procedure (SOP) included with the sample.
siting plan. Every public water system must specify and sample three repeat locations, regardless of how many routine samples are taken. Systems may specify more than three locations if approved by the TCEQ. If a groundwater system serves a total of 1,000 people or less, an entry point sample can be used as the third repeat location. A triggered source monitoring (TSM) sample can double as the third repeat sample if the groundwater system only operates one well.

The TCEQ may require additional samples in the distribution system for raw source water to ensure the protection of public health.
### Table 6.3. Requirements for a Table of Coliform Sample Sites

<table>
<thead>
<tr>
<th>Site Code or Letter</th>
<th>Address of Routine</th>
<th>Sample Schedule</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use a number or letter that corresponds to the site on your distribution system map.</td>
<td>Provide a street address for the sample site. If it is a sample station, provide a description of its location.</td>
<td>List the days or weeks that sampling should occur for each site or group of sites.</td>
<td>Make any notes relating to sampling schedule or locations.</td>
</tr>
</tbody>
</table>
### Table 6.4. Example of a Coliform Sample Site Table

<table>
<thead>
<tr>
<th>Sit</th>
<th>Address</th>
<th>Upstream</th>
<th>Downstream</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2468 Kyle St.</td>
<td>2460 Kyle St. 2462 Kyle St. 2464 Kyle St. 2466 Kyle St.</td>
<td>2470 Kyle St. 2472 Kyle St. 2474 Kyle St. 2476 Kyle St.</td>
</tr>
<tr>
<td>B</td>
<td>357 Buda Rd.</td>
<td>349 Buda Rd. 351 Buda Rd. 353 Buda Rd. 355 Buda Rd.</td>
<td>359 Buda Rd. 361 Buda Rd. 363 Buda Rd. 365 Buda Rd.</td>
</tr>
<tr>
<td>D</td>
<td>731 Wood Creek</td>
<td>723 Wood Creek 725 Wood Creek 727 Wood Creek 729 Wood Creek</td>
<td>733 Wood Creek 735 Wood Creek 737 Wood Creek 739 Wood Creek</td>
</tr>
<tr>
<td>E</td>
<td>22222 Henly Heights</td>
<td>22214 Henly Heights 22216 Henly Heights 22218 Henly Heights 22220 Henly Heights</td>
<td>22224 Henly Heights 22226 Henly Heights 22228 Henly Heights 22230 Henly Heights</td>
</tr>
</tbody>
</table>
Disinfectant Residual: Free or Total Chlorine (30 TAC 290.110)

A system that uses free chlorine must measure the concentration of free chlorine in the distribution system. A system that uses chloramines must measure the concentration of total chlorine in the distribution system. For more information about disinfectant residual monitoring and reporting, please see the TCEQ’s publication Disinfectant Monitoring for Public Water Systems (RG-407).

Surface water systems currently must submit information about chlorine residual on the Surface Water Monthly Operating Report (SWMOR). Entry point disinfectant monitoring for systems that treat SW or GUI is discussed in Chapter 3 of this guidance.

**Location**

Disinfectant residuals must be measured at the same location where samples are collected for coliform testing. For convenience, you can pick additional disinfectant sites that are representative of the whole distribution system.

**Frequency**

Disinfectant residuals must be measured at the same time that samples are collected for coliform testing.

If a system uses SW or GUI, you must also measure disinfectant residual daily at representative locations within the distribution system.

If you use only groundwater or purchased water but serve at least 250 connections, or 750 people, you must still measure the disinfectant residual daily at representative locations within the distribution system.

If you use only groundwater or purchased water and serve fewer than 250 connections and 750 people, you must measure the disinfectant residual at representative locations within the distribution system at least once every seven days.
### Table 6.5. Requirements for a Disinfectant Residual Sample Site Table

<table>
<thead>
<tr>
<th>Site Code or Letter</th>
<th>Address of Routine Distribution Sample Site</th>
<th>Sample</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use a number or letter corresponds to the dot showing the site on distribution system</td>
<td>Provide a street address for sample site. If it is a sample station, provide a dummy or a description of its location.</td>
<td>List the days or weeks that should occur for site or group of sites.</td>
<td>Make any notes relating to the sampling or locations.</td>
</tr>
</tbody>
</table>
Table 6.6. Example of a Disinfectant Residual Sample Site Table for a Community System Required to Have Five Sites

<table>
<thead>
<tr>
<th>Site</th>
<th>Address</th>
<th>Schedule</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2468 Kyle St.</td>
<td>Monday, Saturday</td>
<td>Hose bibb on Mayor Kolache’s house</td>
</tr>
<tr>
<td>B</td>
<td>357 Buda Rd.</td>
<td>Tuesday, Sunday</td>
<td>Tap on pink house next to elevated</td>
</tr>
<tr>
<td>C</td>
<td>6432 Hays Way</td>
<td>Wednesday</td>
<td>Hose bibb</td>
</tr>
<tr>
<td>D</td>
<td>731 Wood Creek</td>
<td>Thursday</td>
<td>New sample station 2</td>
</tr>
<tr>
<td>E</td>
<td>22222 Henly Hts.</td>
<td>Friday</td>
<td>Sample station 1</td>
</tr>
</tbody>
</table>
### Table 6.7. Example of a Disinfectant Residual Sample Site Table for a Non-transient Non-community (NTNC) System Required to Have Five Sites and Sample Daily

<table>
<thead>
<tr>
<th>Site</th>
<th>Location</th>
<th>Schedule</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Lab tap</td>
<td>Monday</td>
<td>Licensed Lab tech collects on 1st shift. Standard Operating Procedure is in QC manual (SOP QC-007).</td>
</tr>
<tr>
<td>B</td>
<td>Men’s washroom by office</td>
<td>Tuesday</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Main break room sink</td>
<td>Wednesday</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Eye wash by process unit A</td>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Safety shower by machine 1</td>
<td>Friday</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Lab tap</td>
<td>Saturday</td>
<td>1st shift overtime lab crew supervisor collects.</td>
</tr>
<tr>
<td>B</td>
<td>Men’s washroom by office</td>
<td>Sunday</td>
<td>Sunday 3rd shift mfg. supv. collects sample.</td>
</tr>
</tbody>
</table>
Table 6.8. Example of a Disinfectant Residual Sample Site Table for a Transient Non-community (TNC) System Required to Have Five Sites and Sample Weekly

<table>
<thead>
<tr>
<th>Site</th>
<th>Location</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Coffee dispensing area sink</td>
<td>1st Monday of month</td>
</tr>
<tr>
<td>B</td>
<td>Spigot out by gas pumps</td>
<td>2nd Monday of month</td>
</tr>
<tr>
<td>C</td>
<td>Women’s bathroom sink</td>
<td>3rd Monday of month</td>
</tr>
<tr>
<td>D</td>
<td>Hose bibb in back of store</td>
<td>4th Monday of month</td>
</tr>
<tr>
<td>E</td>
<td>Water dispensing unit in parking lot</td>
<td>5th Monday (if there is one)</td>
</tr>
</tbody>
</table>
Sampling for Systems that Use Monochloramine

Some systems are allowed to use monochloramine as a disinfectant, in addition to or as a replacement for free chlorine. If your system uses monochloramine, you should include as an attachment a copy of your Nitrification Action Plan (NAP) indicating how you ensure that nitrification is not causing a loss of residual in the distribution system.

Sampling for Systems that Use Chlorine Dioxide (30 TAC 290.110)

All public water systems that use chlorine dioxide (ClO2) in their treatment process must routinely monitor for chlorine dioxide and its disinfection byproduct, chlorite, at the point of entry and within the distribution system. See Chapter 8. Disinfection Byproducts (DBPs) for more information on chlorite monitoring and reporting. The Chlorine Dioxide Monthly Operating Report (ClO2MOR) and chlorite results must be mailed to TCEQ by the tenth day of the month following the end of the reporting period. You can get the ClO2 MOR on the TCEQ website from the “Forms” link.

Although chlorine dioxide is very useful as a disinfectant, elevated chlorine dioxide residuals in the distribution system are undesirable because of the possibility of adverse effects on the development of children’s central nervous systems. Usually, this is not a problem because systems use chlorine dioxide to treat the raw water, and by the time the water leaves the plant, all the chlorine dioxide is removed.

To use chlorine dioxide in your system, you must have TCEQ approval. Call the TCEQ’s Technical Review and Oversight Team at 512-239-4691. All samples taken must be analyzed at a laboratory approved by TCEQ.

- Frequency: If your system uses chlorine dioxide, you must collect your own chlorine dioxide samples at the entry point to the distribution system. You must measure the chlorine dioxide residual at the entry point once every day for compliance. The chlorine dioxide concentration is reported on the ClO2MOR. If the concentration of chlorine dioxide at the entry point is over the maximum residual disinfection level (MRDL) of 0.8 mg/L*, the operator must do additional sampling in the distribution system.

- Location: Samples must be taken at each entry point that has water treated with chlorine dioxide. (Read section 4.1 for the definition of an entry point.)

*A water system that violates the MRDL for chlorine dioxide must notify the TCEQ within 24 hours of the discovery of a MRDL exceedance occurring at the point of entry.

Distribution System Chlorine Dioxide

A system that uses chlorine dioxide must measure chlorine dioxide in the distribution system if the entry point sample exceeds the MCL. The first sample must be collected within two hours of the discovery of the elevated chlorine dioxide levels. The two subsequent samples must be collected at six and eight hour intervals thereafter.
Frequency: If the chlorine dioxide residual sample taken daily at the entry point exceeds 0.8 mg/L, the system must take three additional chlorine dioxide samples within the distribution system.

Location: Systems must collect three additional samples from within the distribution system for chlorine dioxide sampling. If your system does not have rechlorination within the distribution system, a sample location must be designated at the first service connection nearest the plant where elevated levels of chlorine dioxide were found. If the system has rechlorination within the distribution system, sampling sites must be designated as follows: the first connection nearest the plant that contained elevated levels of chlorine dioxide, at the first service connection downstream of the booster station where rechlorination occurs, and a third sample taken from the far reaches of the distribution system. Additional samples taken within systems that have rechlorination facilities in the distribution system will be based on the flow rate of water as it moves through the distribution system.
Chapter 7. Inorganic, Organic and Radionuclide Rules

For all chemical compliance samples listed in this chapter, the Texas Commission on Environmental Quality (TCEQ) utilizes a third-party contractor to collect samples for all public water systems in the state. Samples are collected by trained, certified sample collectors that hold a valid water operator license. In addition, the TCEQ conducts annual audits of the sampling contractor to ensure that samples are collected according to the analysis method, consistently, and from the proper locations. If you have any questions about monitoring requirements, contact the Drinking Water Standards Section at (512)239-4691 or by e-mail at PDWS@tceq.texas.gov.

Inorganic Contaminants (30 TAC 290.106)

The requirements for routine sampling of inorganic contaminants apply to all community and non-transient, non-community (NTNC) systems. The requirements for nitrate, nitrite and secondary contaminant sampling also applies to transient non-community (TNC) systems.

Minerals and Metals (30 TAC 290.106)

Public water systems must sample for several inorganic contaminants (IOCs) that include metals and minerals. For these analyte groups, some chemical analytes have a maximum contaminant level (MCL) established to determine maximum allowable amount of a contaminant in drinking water to protect public health. Some contaminants do not pose a risk to public health, but affect the aesthetic nature of the water, such as taste, color, and odor; these contaminants have a secondary contaminant level (SCL).

Frequency

Community and NTNC groundwater entry points to the distribution system are routinely monitored for minerals and metals every three years and surface water entry points are monitored annually. TNC systems will routinely monitor for minerals and metals that are classified as secondary standard constituents once every three years. Secondary standard constituent levels are based on the aesthetic nature of the chemical in that it does not cause physical harm, but can discolor drinking water and may add taste and/or odor problems.

If the sample result from a sample site exceeds the MCL, the system must monitor quarterly at that sample site for the analyte in exceedance starting the next quarter after the exceedance occurs. For minerals and metals, systems may be required to monitor quarterly due to an exceedance for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium. After the initiation of quarterly monitoring, the sample site may return to routine monitoring frequency after the sample site is reliably and consistently below the MCL for a minimum of two quarters for a groundwater sample site and a minimum of four quarters for a surface water sample site.
**Location**

Samples must be collected at each entry point to the distribution system.

**Nitrate and Nitrite (30 TAC 290.106)**

Nitrate is an inorganic chemical that occurs naturally as part of the nitrogen cycle and finds its way into groundwater by contamination from fertilizers, feed lots and septic fields. Nitrite (NO₂) can also be converted into nitrate (NO₃) through a chemical reaction called oxidation, which can occur in distribution.

Nitrate at levels above the MCL pose an acute health risk, especially for children under six months of age. 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. If a child is under the age of six months, the child must be given an alternative water supply for any consumption. Boiling the affected water is not an effective treatment for nitrate removal.

**Frequency**

All public water systems are required to routinely monitor for nitrate at each entry point to the distribution system. All public water systems must monitor each groundwater entry point to the distribution system annually. A community or NTNC system must monitor each surface water entry point to the distribution system quarterly. A TNC system shall sample annually at each surface water entry point to the distribution system. High nitrate or nitrite levels may require an increased monitoring frequency.

If a community or NTNC water system has a result from a sample site that is equal to or greater than 50% of the nitrate MCL of 10.0 milligrams per liter (mg/L) or nitrite MCL of 1.0 mg/L, the PWS is then required to monitor for nitrate or nitrite quarterly at that sample location. The PWS may return to the routine monitoring frequency once the chemical result data is reliably and consistently below the MCL for a minimum of four consecutive quarters.

**Location**

Samples must be collected at each entry point to the distribution system.

**Fluoride**

Fluoride is a mineral that occurs naturally and is released from rocks into the soil, water and air. Almost all water contains some level of fluoride. Fluoride can also be added to drinking water supplies as a public health measure for reducing cavities.

All public water systems must monitor for fluoride as it is classified as both a primary and secondary standard. Systems that have fluoride over the SCL of 2.0 mg/L must notify their customers of those levels annually.

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. Fluoride in drinking water at half the MCL or more may cause mottling of children’s teeth, usually in children less than nine years of age. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in...
developing teeth before they erupt from the gums. An alternate source of water should be provided to the affected population, which consists of children less than nine years old.

### Frequency
Community and NTNC groundwater entry points to the distribution system are routinely monitored for fluoride every three years and surface water entry points are monitored annually. TNC systems will routinely monitor fluoride once every three years with the collection of the secondary standard analyte group.

If a community or NTNC water system has a result from a sample site that is equal to or greater than fluoride MCL of 4.0 mg/L, the PWS is then required to monitor for fluoride quarterly at that sample location. The PWS may return to the routine monitoring frequency once the chemical result data is reliably and consistently below the MCL for a minimum of two quarterly samples at a groundwater sampling site or four quarterly samples at a surface water sampling site.

### Location
Samples must be collected at each entry point to the distribution system.

### Secondary Standards
Secondary constituents do not pose a risk to public health, but affect the aesthetic nature of the water, such as taste, color and odor; these contaminants have an SCL. Fluoride is classified as both a primary and secondary drinking water standard. The requirements for secondary constituent monitoring applies to all public water systems. With the collection of the mineral and metal samples, community and NTNC groundwater and surface water entry points to the distribution system are routinely monitored for secondary constituents. TNC systems will routinely monitor for secondary constituents at each entry point to the distribution system.

Secondary constituent monitoring for TNC systems does not include the primary drinking water standards for minerals and metals, with the exception of fluoride.

### Frequency
Community and NTNC groundwater entry points to the distribution system are routinely monitored for secondary constituents every three years and surface water entry points are monitored annually with the collection of the mineral and metal samples. TNC systems are routinely monitored for secondary standards once every three years at each entry point to the distribution system.

### Location
Samples must be collected at each entry point to the distribution system.

### Asbestos
All community and NTNC systems, including systems that purchase water from other public water systems, must be evaluated for asbestos vulnerability. Systems must keep a record of the size, length, age and location of asbestos-cement pipe in the distribution system.
Frequency

Systems will monitor for asbestos once during the first three years of each nine-year compliance cycle. If a community of NTNC water system has a result from a sample site that is equal to or greater than the asbestos MCL of 7 million fibers/liter (MFL), the PWS is then required to monitor for asbestos quarterly. The PWS may return to the routine monitoring frequency once the chemical result data is reliably and consistently below the MCL for a minimum of two quarterly samples at a groundwater system or four quarterly samples at a surface water system.

Location

Asbestos will be monitored at locations where asbestos contamination is likely to occur. Additional sample locations may be required based on the size, length, age and location of asbestos-cement pipe in the distribution system.

Organic Contaminants (30 TAC 290.107)

Public water systems are monitored for both synthetic organic chemical (SOC) contaminants and volatile organic chemical (VOC) contaminants. All community and NTNC public water systems must routinely monitor for SOC and VOC contaminants at each entry point to the distribution system.

Synthetic Organic Chemicals (30 TAC 290.107)

Synthetic organic chemical (SOC) contaminants include pesticides, herbicides and other industrial chemicals that may be found to be present in drinking water.

SOC contaminants are separated by Environmental Protection Agency (EPA) analytical methods into four chemical analyte groups: (1) synthetic organics group 5 {SOC5}, (2) synthetic organic chemicals – EPA Method 504.1 {504}, (3) synthetic organic chemicals – EPA Method 515.4 {515} and (4) synthetic organic chemicals – EPA Method 531.1 {531}.

Frequency

Systems are required to routinely monitor for SOC contaminants once every three years at each entry point to the distribution system after the initial compliance period. For the initial compliance period, the system must monitor at each entry point for four consecutive quarters for each SOC analyte group.

If a sample result for any SOC contaminant is above the detection limit, the system must monitor quarterly at that sampling point for the SOC analyte group in which the detection occurred. A groundwater sample site must monitor for a minimum of two consecutive quarters and a surface water sample site must monitor for a minimum of four consecutive quarters. After the consecutive quarterly monitoring, the sampling point may monitor annually for that SOC analyte group.

If a sample result for any SOC contaminant exceeds the MCL, the sample site must be monitored quarterly for the SOC analyte group in which the exceedance occurred. After a minimum of four consecutive quarterly samples that show the system is in compliance and the system is reliably and consistently below the MCL, the system may monitor annually for that SOC analyte group during the quarter that previously yielded the highest analytical result.
**Location**

Samples must be collected at each entry point to the distribution system.

**Volatile Organic Chemicals (30 TAC 290.107)**

Volatile organic chemical (VOC) contaminants are analyzed using EPA method 524.2. VOC contaminants include common petroleum chemicals, such as benzene, ethylbenzene, toluene, xylenes and MTBE, as well as solvents such as tetrachloroethene, carbon tetrachloride and trichloroethene.

**Frequency**

Systems are required to routinely monitor for VOC contaminants annually at each entry point to the distribution system after the initial compliance period. For the initial compliance period, the system must monitor at each entry point to the distribution system for four consecutive quarters.

If a sample result for any VOC contaminant is above the detection limit, the system must monitor quarterly at that sampling point. A groundwater sample site must monitor for a minimum of two consecutive quarters and a surface water sample site must monitor for a minimum of four consecutive quarters. After the consecutive quarterly monitoring, the sampling point may monitor annually.

If a sample result for any VOC contaminant exceeds the MCL, the sample site must be monitored quarterly. After a minimum of four consecutive quarterly samples that show the system is in compliance and the results are reliably and consistently below the MCL, the system may monitor annually during the quarter that previously yielded the highest analytical result.

Systems that exceed or violate the MCL for asbestos must monitor quarterly. If the results of quarterly monitoring show that the water is reliably and consistently below the MCL, sampling will be reduced to annually.

**Location**

Samples must be collected at each entry point to the distribution system.

**Radionuclide Contaminants (30 TAC 290.108)**

All community public water systems must routinely monitor for naturally occurring and man-made radionuclide contaminants. Naturally occurring radionuclides include combined radium-226 and radium-228, gross alpha particle activity (including radium-226 but excluding radon and uranium) and uranium.
<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Detection Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross alpha particle activity</td>
<td>3 picoCuries per liter (pCi/L)</td>
</tr>
<tr>
<td>Radium-226</td>
<td>1 pCi/L</td>
</tr>
<tr>
<td>Radium-228</td>
<td>1 pCi/L</td>
</tr>
<tr>
<td>Uranium</td>
<td>1 microgram per liter (µg/L)</td>
</tr>
</tbody>
</table>
### Table 7-2: Maximum Contaminant Levels for Radionuclides

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Maximum Contaminant Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross alpha particle activity</td>
<td>15 picoCuries per liter (pCi/L)</td>
</tr>
<tr>
<td>Combined Radium</td>
<td>5 pCi/L</td>
</tr>
<tr>
<td>Uranium</td>
<td>30 micrograms per liter (µg/L)</td>
</tr>
</tbody>
</table>
**Frequency**

If the sample results for all contaminants (gross alpha particle activity, combined radium-226, radium-228 and uranium) at a sampling point are below the detection limits, the system must monitor at that sampling point at least once every nine years.

If a sample result for any radionuclide contaminant is at or above the detection limit but at or below half of the MCL, the system must monitor that sampling point at least once every six years.

If a sample result for any radionuclide contaminant is above half the MCL, the system must monitor that sampling point at least every three years.

If a sample result for any radionuclide contaminant is at or above the MCL, the system must monitor quarterly at that sampling point. If the average of four consecutive quarterly monitoring results average below the MCL, the sampling point may return to a routine frequency determined by the sample result.

**Location**

Samples must be collected at each entry point to the distribution system.
Chapter 8. Disinfection Byproducts Rule

The TCEQ’s sample contractor collects total trihalomethane (TTHM) and haloacetic acid (HAA5) samples in the distribution system. It is the system’s responsibility to identify sample sites and coordinate with sample collectors to ensure that the required samples are collected.

All community and non-transient, non-community systems are required to complete DBP sampling. Transient non-community systems (TNCs) are not required to sample for DBPs.

Designating DBP compliance monitoring sites requires TCEQ approval. Site names are kept as data, and data quality is very important. In order to change sample sites, you must get TCEQ approval. The best way to do this is to contact the TCEQ as soon as you are aware that a change must be made. You can contact the DBP rule coordinators at 512-239-4691, or by e-mail at <DBP@tceq.texas.gov>.

Stage 2 Disinfectants and Disinfection Byproducts Rule (DBP2) Requirements

All systems are now sampling under the DBP2 Rule. Sample frequency and number of sample sites is based on the system's population and type of source water. This is a more appropriate way to monitor for DBPs, since it does a better job of geographically representing distribution systems and risk.

Frequency

Table 8.1 lists information in regards to routine sampling frequencies for all public water systems based on source water type and population served. Any TTHM and HAA5 sample collected for compliance purposes must be collected during normal operating conditions. The most updated sampling schedule for your system can be found on Drinking Water Watch.
<table>
<thead>
<tr>
<th>Water Type</th>
<th>Retail Population</th>
<th>Routine Frequency 1</th>
<th>Routine Number of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water (or Groundwater Under the Direct Influence of Surface Water) 2</td>
<td>fewer than 500</td>
<td>annual</td>
<td>1 or 2 3</td>
</tr>
<tr>
<td></td>
<td>500 to 3,300</td>
<td>quarterly 4</td>
<td>1 or 2 3</td>
</tr>
<tr>
<td></td>
<td>3,301 to 9,999</td>
<td>quarterly 4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>10,000 to 49,999</td>
<td>quarterly 4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>50,000 to 249,999</td>
<td>quarterly 4</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>250,000 to 999,999</td>
<td>quarterly 4</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>1,000,000 to 4,999,999</td>
<td>quarterly 4</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>5,000,000 or more</td>
<td>quarterly 4</td>
<td>20</td>
</tr>
<tr>
<td>Groundwater</td>
<td>fewer than 500</td>
<td>annual</td>
<td>1 or 2 3</td>
</tr>
<tr>
<td></td>
<td>500 to 9,999</td>
<td>annual</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>10,000 to 99,999</td>
<td>quarterly 4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>100,000 to 499,999</td>
<td>quarterly 4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>500,000 or more</td>
<td>quarterly 4</td>
<td>8</td>
</tr>
</tbody>
</table>

1. All systems must monitor during month of highest disinfection byproduct concentrations.

2. A system that uses any treated surface water or groundwater under the direct influence of surface water shall be considered a surface water system for purposes of this section.

3. Systems serving fewer than 500 people and surface water systems serving 500 to 3,300 people must identify two sample sites in accordance with 40 Code of Federal Regulations §141.605(b) and may sample at a single site if the highest total trihalomethanes (TTHM) and haloacetic acids (group of five) (HAAS5) concentrations occur at the same time and location, one dual sample set must be collected at that location. If highest TTHM and HAAS concentrations occur at different locations, then
a single TTHM sample must be collected at the location with higher historical TTHM, and a single HAA5 sample must be collected at the location with higher historical HAA5.

4. Systems on quarterly monitoring must take dual sample sets every 90 days.

5. Monitoring locations must be approved by the TCEQ.

Systems may be placed on reduced monitoring when the locational running annual average (LRAA) at each site is less than or equal to 0.040 mg/L for TTHM and less than or equal to 0.030 mg/L for HAA5. Table 8.2 lists information in regards to reduced sampling frequencies for all public water systems based on source water type and population served.
<table>
<thead>
<tr>
<th>Source Water Type</th>
<th>Population Size Category</th>
<th>Monitoring Frequency</th>
<th>Distribution System Monitoring Location Total per Monitoring Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface or GUI</td>
<td>less than 500</td>
<td>Annual</td>
<td>Monitoring may not be reduced.</td>
</tr>
<tr>
<td></td>
<td>500 to 3,300</td>
<td>Annual</td>
<td>1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.</td>
</tr>
<tr>
<td></td>
<td>3,301 to 9,999</td>
<td>Annual</td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>10,000 to 49,999</td>
<td>Quarterly</td>
<td>2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs.</td>
</tr>
<tr>
<td></td>
<td>50,000 to 249,999</td>
<td>Quarterly</td>
<td>4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.</td>
</tr>
<tr>
<td></td>
<td>250,000 to 999,999</td>
<td>Quarterly</td>
<td>6 dual sample sets at the locations with the three highest TTHM and three highest HAA5 LRAAs.</td>
</tr>
<tr>
<td></td>
<td>1,000,000 to 4,999,999</td>
<td>Quarterly</td>
<td>8 dual sample sets at the locations with the four highest TTHM and four highest HAA5 LRAAs.</td>
</tr>
<tr>
<td></td>
<td>5,000,000 or more</td>
<td>Quarterly</td>
<td>10 dual sample sets at the locations with the five highest TTHM and five highest HAA5 LRAAs.</td>
</tr>
<tr>
<td>Ground-water</td>
<td>fewer than 500</td>
<td>Triennial</td>
<td>1 dual sample set every three years if the highest TTHM and HAA5 measurements occurred at the same location and quarter.</td>
</tr>
</tbody>
</table>

1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter. 2
<table>
<thead>
<tr>
<th>Source Water Type</th>
<th>Population Size Category</th>
<th>Monitoring Frequency</th>
<th>Distribution System Monitoring Location Total per Monitoring Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter. 2</td>
</tr>
<tr>
<td>500 to 9,999</td>
<td>Annual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10,000 to 99,999</td>
<td>Annual</td>
<td>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</td>
<td></td>
</tr>
<tr>
<td>100,000 to 499,999</td>
<td>Quarterly</td>
<td>2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs.</td>
<td></td>
</tr>
<tr>
<td>500,000 or more</td>
<td>Quarterly</td>
<td>4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.</td>
<td></td>
</tr>
</tbody>
</table>

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 the highest historical TTHM levels and the HAA5 sample must be collected during the quarter with the highest historical HAA5 level.

**Chlorite Monitoring (for Chlorine Dioxide Systems; 30 TAC 290.114)**

Chlorite is an inorganic byproduct regulated at all systems that use chlorine dioxide. Public water systems that use chlorine dioxide as a method for disinfection must perform chlorite monitoring. Laboratory results must be reported to TCEQ with the Chlorine Dioxide Monthly Operating Report (ClO2MOR).

**Frequency**

Daily samples must be collected from the point of entry and analyzed for chlorite at an approved laboratory on any day that chlorine dioxide is used. In addition, once a month a three-sample set must be collected in the distribution system and analyzed for chlorite at a NELAP accredited laboratory. This three-sample set must be collected on a day when chlorine dioxide is used and each sample in the set must be collected on the same day. A list of NELAP accredited laboratories can be
obtained from the TCEQ’s Quality Assurance Section at 512-239-5942. A PDF list is also available online. If a daily chlorite result collected at the entry point exceeds the maximum contaminant level (MCL) of 1.0 mg/L, one three-sample set must be collected in the distribution system within 24 hours. Sample collection location is outlined in the next subsection.

**Location**

Daily chlorite samples must be collected at each entry point serving chlorine dioxide treated water. The monthly chlorite three-sample set must be collected at the locations listed in the monitoring plan and labelled with the physical address. Designation of the near, middle and far distribution system sample locations should be representative of the entire distribution system. The first sample location must be at a location near the first customer nearest the treatment plant, the second sample location must be representative of the average water residence time, and the third sample location must reflect the maximum water residence time in the distribution system.

**Bromate Monitoring (for Systems Using Ozone; 30 TAC 290.114)**

Bromate is a disinfection byproduct regulated at any community or non-transient, non-community public water system that uses ozone. Bromate monitoring must be performed during any month that a public water system uses ozone for water treatment.

**Frequency**

Each plant that uses ozone must collect one sample at the entry point to the distribution every month. The sample must be collected when the ozone is in use. Samples must be analyzed by an accredited lab.

**Location**

Samples must be taken at each entry point.
Chapter 9. Lead and Copper Rule (LCR)

Lead and Copper Tap and Source Water (Entry Point) Sampling

Frequency

All community (C) and non-transient non-community (NTNC) systems must comply with lead and copper sampling requirements. Transient non-community (TNC) systems—such as parks or convenience stores—do not have to sample for lead and copper in the distribution system.

All new or reactivated community and non-transient non-community water systems must submit the Lead and Copper Sample Site Selection Pool and Materials Survey Checklist forms (TCEQ-Form 20467) before any sampling event takes place. Each system is responsible for using an accredited lab for lead and copper analysis as well as getting their own bottles. To confirm your schedule status or receive any additional assistance, call our Lead and Copper Rule coordinator at 512-239-4691. After an action level exceedance community and non-transient non-community water systems are required to conduct source water (entry point) lead and copper sampling.

Location

Lead and copper tap samples must be taken at customers’ taps, where it is most likely that lead or copper may be corroding out of the pipes and entering the water. The monitoring plan must contain a list of the addresses where samples must be taken for lead and copper.

When you change sites, you must submit a new Sample Site Selection Form (TCEQ-20467) to the TCEQ’s Lead and Copper Rule coordinator for approval. You can reach Drinking Water Rule coordinators at the main Drinking Water Quality Section phone number (512-239-4691) or by e-mail at <PDWS@tceq.texas.gov> (do not type the brackets).

Table 9.1 shows a brief example of how to list your lead and copper sites.
Lead and copper source water (entry point) samples must be collected at each entry point to the distribution system.

**New Water Systems**

If your system is new, make sure you contact the Lead and Copper Rule team to ensure you do the required initial monitoring for lead and copper.

**Water Quality Parameter sampling**

WQP samples are taken at outside, fully flushed, representative samples stations/taps in the distribution system and at each entry point to the distribution system. Entry points are defined as being located after treatment but before the water enters into the distribution system. Applicable distribution sample locations are usually the same locations where monthly bacteriological samples are taken. Update a sampling plan with all site addresses used for sampling WQP’s and keep the information in your LCR records for at least 12 years.

Submit the WQP sampling plan to the TCEQ’s Lead and Copper Rule coordinator for approval. After approval, update the system’s monitoring plan with the new addresses/sites.

### Table 9.1. Example of a Lead and Copper Sample Site Table for a Small Community System

<table>
<thead>
<tr>
<th>Site</th>
<th>Regular or Backup</th>
<th>Sample Site Address</th>
<th>Tier Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCR001</td>
<td>Regular</td>
<td>1001 Arbor Vitae Ln.</td>
<td>Tier 1</td>
</tr>
<tr>
<td>LCR002</td>
<td>Regular</td>
<td>2222 Bittersweet St.</td>
<td>Tier 1</td>
</tr>
<tr>
<td>LCR003</td>
<td>Regular</td>
<td>3456 Cedar Pl.</td>
<td>Tier 1</td>
</tr>
<tr>
<td>LCR004</td>
<td>Regular</td>
<td>4999 Elder Pl.</td>
<td>Tier 1</td>
</tr>
<tr>
<td>LCR005</td>
<td>Regular</td>
<td>5005 Forsythia Cir.</td>
<td>Tier 1</td>
</tr>
</tbody>
</table>
Table 9.2. Example of WQP Sample Sites Table for a Small Community System

<table>
<thead>
<tr>
<th>Site Location</th>
<th>Sample Site Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS01</td>
<td>1001 Main St. (outside tap)</td>
</tr>
<tr>
<td>DS01</td>
<td>2222 Bittersweet St. (outside hose bib)</td>
</tr>
<tr>
<td>DS01</td>
<td>3456 Cedar Pl. (outside sampling station)</td>
</tr>
<tr>
<td>EP001</td>
<td>Entry point 1 TPSW001</td>
</tr>
<tr>
<td>EP002</td>
<td>Entry point 2 TPSW002</td>
</tr>
</tbody>
</table>

WQPs consist of pH, temperature, alkalinity, calcium, chloride, conductivity, hardness, iron, manganese, sodium, sulfate, total dissolved solids and inhibitors if added to the system to control corrosive water. PWSs are required to be approved for sampling using correct methods or to use an accredited or approved laboratory. See 30 TAC §290.117(h)(4) and 30 TAC §290.119 for further instructions on approval and accreditation requirements.

If the field measurements (pH and temperature) are to be collected by the PWS, the system itself must be approved to collect those samples using approved methods. For more information about lab approval, please see the Drinking Water Laboratory Approval Form found on the TCEQ Monitoring Plan page at https://www.tceq.texas.gov/drinkingwater/monitoring_plans/monitoring_plans.html.

All sampling information, forms used in sampling, chain of custodies, laboratory information, classification tier information and action level exceedance information is found on the TCEQ Lead and Copper website.

**New Water Systems**

If your system is new, make sure you contact the LCR team to ensure you do the required initial monitoring for lead and copper and WQPs.
Chapter 10. Laboratory Approval Form and Instructions

This chapter includes information on drinking water laboratory approval and how to request this approval from the TCEQ.

Who Must Complete the Laboratory Approval Form?

All community and non-transient non-community public water systems must complete the Drinking Water Laboratory Approval Form and include it with their monitoring plan.

Water systems that treat surface water (SW) or groundwater under the influence of surface water (GUI) must submit a Drinking Water Lab Approval Form for each treatment plant with a monitoring plan submittal to the TCEQ.

Water systems that treat only groundwater (GW) or that purchase water (either GW or SW) must complete the form, include it with their monitoring plan and provide it to TCEQ upon request.

Laboratory Approval Procedure

Public water systems must fill out and submit a Drinking Water Laboratory Approval Form (TCEQ-10450) to indicate the approved-lab compliance samples for which they are responsible. The TCEQ will review this form upon receipt or during a CCI and notify the system if the form is incomplete or if the methods noted are not acceptable.

If the public water system sends any of the approved-lab analyses to an outside lab (in other words, a commercial lab), that lab must be listed on the form and maintain commercial approval from the TCEQ for the specified analyses.

For information on drinking water laboratory approval, contact the Drinking Water Lab Approval Coordinator at 512-239-4691.

Types of Analytes

There are two classifications of analytes: approved-lab analytes and accredited-lab analytes.

Public water systems may themselves perform analysis of approved-lab analytes, as long as they follow EPA and TCEQ approved methods. In some cases, public water system labs may be accredited for the approved-lab analytes.

If a lab is accredited as a Drinking Water Matrix for certain approved-lab analytes, an approval requirement for the analyte is not necessarily required.

For the accredited-lab analytes, public water system must contract with a TCEQ accredited lab for analysis.
Approved-Lab Analytes

Public water systems must analyze samples at a laboratory approved by the TCEQ’s Drinking Water Standards Section. Most systems will analyze these samples at their own lab. However, some systems will contract with a commercial laboratory for analysis. The Drinking Water Laboratory Approval Form is the TCEQ’s way of ensuring that systems use acceptable methods for the following approved-lab analytes:

- free and total chlorine disinfectant residual
- turbidity and total organic carbon (TOC)
- pH
- temperature
- alkalinity
- silica
- chlorine dioxide
- entry point chlorite
- calcium
- phosphate
- ultraviolet light absorbance at 254 nm (UV254)
- conductivity

Accredited-Lab Analytes

Public water systems must have the following analyses performed by a lab that is accredited by the TCEQ:

- bacteriological (total coliform and fecal coliform)
- bromate and bromide
- monthly chlorite distribution system three-sample set
- lead and copper
- inorganic chemicals (IOC)
- radiochemicals
- synthetic and volatile organic chemicals (SOC and VOC)
- total trihalomethanes (TTHM) and haloacetic acids (HAA5)

Except for the bacteriological samples, lead and copper, bromate, and monthly chlorite samples, all of the accredited-lab analyze samples used for compliance are collected by the TCEQ’s Drinking Water Compliance Sampling contractor. The contractor delivers the samples for analysis to the laboratories of either the Texas Department of State Health Services (DSHS) or the Lower Colorado River Authority. Only these two laboratories are permitted to analyze samples for compliance purposes, with the exception of asbestos compliance samples which are sent to Crisp Analytical.
For more information on lab accreditation, visit our “Laboratory Accreditation and Certification” web page, at <www.tceq.texas.gov/agency/qa/env_lab_accreditation.html>.

“Not Required” Analytes

Not all PWS labs are required to monitor for each approved-lab analyte. If your system is not required to conduct a specific approved-lab analyte, indicate this as “Not Required” on the Drinking Water Laboratory Approval Form.

Submitting a Drinking Water Lab Approval Form

This section describes how to submit the Drinking Water Laboratory Approval Form.

**Mailing Address**

Attn: Laboratory Approval Coordinator
Drinking Water Standards Section, Mail Code 155
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

**Electronic Mail**

PDWS@tceq.texas.gov

**Fax Number**

Attn: Laboratory Approval Coordinator
(512) 239-6050

**Record Retention**

The TCEQ has rules about record retention. These rules are in the Texas Administrative Code, specifically in 30 TAC 290.46(f). The calibration records for laboratory equipment must be retained for at least three years. The results of chemical analyses must be retained for at least 10 years.
Appendix A. Monitoring Plan Template Instructions

The instructions down below are designed to aide a public water system in the completion of the monitoring plan template. See the instructions within the template itself for more information.

Follow these instructions when filling out the monitoring plan template

1. Read the introduction and general instructions in the monitoring plan template.

If you are a new public water system, need to revise a section of your monitoring plan, or need to update your entire plan, follow these steps.

Note—the monitoring plan template is on the web at: https://www.tceq.texas.gov/drinkingwater/monitoring_plans/PWSMonitoringPlanTemplate.pdf

The TCEQ requires all systems to maintain an up-to-date monitoring plan locally and if applicable to submit the revised section(s) or entire plan to TCEQ’s central office.

2. Gather the attachments you must submit with the template:

The items that must be attached to the monitoring plan template are described throughout the template itself but are also summarized below.

- Plant Schematic

Every water plant contributing to a system’s provided water needs to be included on its own process schematic. A full description of required items can be found on page 4 of the monitoring plan template.

- Revised Total Coliform Rule (RTCR) Sample Siting Plan and Map

The stand-alone RTCR sample siting plan contains sample locations and data pertinent to the new revisions of the coliform rule. This plan also requires a detailed distribution system map. A blank copy can be found at the following link: https://www.tceq.texas.gov/drinkingwater/microbial/revised-total-coliform-rule/.

- Nitrification Action Plan (NAP) – if you use chloramines

Include a copy of your NAP providing in-depth analysis of how your system contains nitrification within your distribution system.

3. Perform necessary research and complete the monitoring plan template.
Review your current information through the Drinking Water Watch (DWW) database.

Information to assist you in completing the monitoring plan template, from water system facilities to sample schedules, can be found on DWW.

- **Mark** all sections in the table of contents applicable to your system and fill in all fields requesting information.
- **Do not complete the form as it is upon opening.** After reading through the instructions the table of contents page needs to be correctly checked so that the system only transcribes information applicable to their system.

4. **If needed, reach out to the TCEQ about additional guidance for completion.**

A system’s monitoring plan needs to be up-to-date and the TCEQ in receipt of updated plans sooner rather than later. If a system is still having trouble completing the template they may request help from the Drinking Water Special Functions Section at (512)239-4691.

The system may also submit a request for free, on-site assistance through the Financial, Managerial, and Technical (FMT) Assistance program. The FMT contractor is a very knowledgeable individual able to help on a wide variety of subjects dealing with your compliance. To schedule, call the TCEQ’s Water Supply Division (WSD) at (512)239-4691 and ask for the FMT Assistance program.

5. **Submit the monitoring plan template and necessary attachments.**

All systems must have an up-to-date monitoring plan and submit the plan if applicable or voluntarily upon any revisions.

Keep a local copy and maintain it also upon any revisions. You may submit the form and attachments to either of the following:

**Physical Copies**
Texas Commission on Environmental Quality
Attn: Monitoring Plan Coordinator
Drinking Water Special Functions Section, Mail Code 155
PO Box 13087
Austin, TX 78711-3087

**Electronic Copies**
PDWS@tceq.texas.gov
**Assistance**

You can view the TCEQ’s database for your system’s points of contact online through the Drinking Water Watch: [http://dww2.tceq.texas.gov/DWW/](http://dww2.tceq.texas.gov/DWW/)

If the information on Drinking Water Watch is incorrect or out-of-date, you can contact the TCEQ’s Drinking Water Inventory and Protection Team at (512)239-4691.
Section A: Points of Contact (POC)

Purpose of section

Distributing drinking water is a complex, important job, so it is imperative that systems have current contact information with the TCEQ for correspondence purposes. This includes individuals ranking from the highest official to the operators or persons performing day to day duties and maintenance. We recommend providing as much information for each contact as possible in the event TCEQ should need to contact the system with regards to the system’s compliance.

The monitoring plan template does not include every type of contact a public water system may have or need to update on behalf of their system. The two remaining contact types, financial and emergency, are both addressed through their own update protocol.

Administrative Contacts need to be listed with a legitimate mailing address to receive any letters discussing but not limited to any rule changes, information or data requests, and notices of violation. Updating this contact with the TCEQ as soon as possible could save the system valuable time and money.

A.1. POC Information

- Write the legal name of the system’s administrative contact in the ‘Administrative Contact Name’ field.
  - Provide contact information for the administrative contact in the form of a valid mailing address, city, state, and ZIP code.
  - Provide additional contact information for the administrative contact by listing a work phone (plus extension if applicable), fax number, and email address.
  - If more than one administrative contact is needed to be listed for the system, click the ‘Add additional Administrative Contact’ button just below the fields of interest.
  - If you do not actually need an additional administrative contact yet clicked the button either on accident or on purpose, simply click the ‘Remove’ button located just below the ‘Email’ field. A minimum of one block of information is built in to the form, so clicking this button will only remove extra fields until only one block of information is left.

- Write the legal name of the system’s owner/legal entity contact in the ‘Owner/Legal Entity Contact Name’ field.
  - Provide contact information for the owner/legal entity contact in the form of a valid mailing address, city, state, and ZIP code.
  - Provide additional contact information for the owner/legal entity contact by listing a work phone (plus extension if applicable), fax number, and email address.
  - If more than one owner/legal entity contact is needed to be listed for the system, click the ‘Add additional Owner/Legal Entity Contact’ button just below the fields of interest.
o If you do not actually need an additional owner/legal entity contact yet clicked the button either on accident or on purpose, simply click the ‘Remove’ button located just below the ‘Email’ field. A minimum of one block of information is built in to the form, so clicking this button will only remove extra fields until only one block of information is left.

- Write the legal name of the system’s public water system contact in the ‘Public Water System Contact Name’ field.
  o Provide contact information for the public water system contact in the form of a valid mailing address, city, state, and ZIP code.
  o Provide additional contact information for the public water system contact by listing a work phone (plus extension if applicable), fax number, and email address.
  o If more than one public water system contact is needed to be listed for the system, click the ‘Add additional PWS Contact’ button just below the fields of interest.
  o If you do not actually need an additional public water system contact yet clicked the button either on accident or on purpose, simply click the ‘Remove’ button located just below the ‘Email’ field. A minimum of one block of information is built in to the form, so clicking this button will only remove extra fields until only one block of information is left.

A.2. Signature Block

Be sure to read the agreement before signing in the respective field as it attests to the validity of the entire document. Fill in the other fields with accurate information including the day of the monitoring plan’s completion and accompanying signature. The signature does not have to come from the administrative contact, though recommended, as long as the person who does sign has the authority to do so on behalf of the public water system. It is also suggested to revisit this page after the entire template has been completed and checked for accuracy and proper completion. The signature block in this document may be sealed with a digital ID the user has created in the past, or it may be physically signed after printing out the document. If you wish to create a digital ID, follow the steps below:

1. Click on the signature block to prompt a pop-up window.
2. Select the option ‘A new digital ID I want to create now’ when asked how to sign the document.
3. The next step will require you to choose how you wish to store the digital ID either as a file on your computer or through the Windows Certificate Store. For ease of access, choose the first option ‘New PKCS#12 digital ID file’.
4. Enter the applicable information in the fields provided, leaving the last three fields untouched to their default values. You may only provide your legal name and email here if desired, as they are the only two fields mandatory to move on to the next step.
5. Choose where on your computer you want to store your digital ID and make note of the location. Enter a password to lock the signature then click Finish.

Section B: Source Details

Purpose of section

A public water system’s source(s) dictates their entire face of compliance: the certain rules they must comply with, the strictness of their disinfection process, and the schedules of many compliance samples ranging from the entry point contractor-collected samples to the disinfectant residual throughout the distribution system. This brief section will confirm not only the main source of water for a system but also any interconnect the system may have which may assist in feeding their distribution system.

B.1. Sources

Enter your first source’s assigned TCEQ Source ID in the applicable field in the format of “#PWSID#”. The first unique value will be based on the type of the source: ‘S’ for surface water intake, ‘G’ for groundwater wells, and ‘P’ for any type of purchased water. Any active source will have a Source ID approved by the TCEQ and displayed on Drinking Water Watch. The second unique value depends on the order of the source sorted by the type. For instance, if a system has two groundwater wells the Source ID’s would be ‘G1234567A’ and ‘G1234567B’. However, if the same system starts receiving water from a nearby system the Source ID for the purchased interconnect would be ‘P1234567A’.

The source name needs to reflect the body of water, well name, or name of the public water system selling water to your system. The location should be an address or relative physical description when applicable.

There are five options to list for a particular source’s availability: permanent (active), seasonal, interim, emergency, and other. The default value for any given row in this table is permanent (active), as these are the sources you should list first. Seasonal sources are only used during a particularly active time of the year, such as a well being in use during higher demand due to vacation season, summer school, or summer camp. An interim source will only be used for a finite time usually while a certain event occurs, such as during construction or an irregular high demand period. Emergency sources will be a permanently established connection but only provided to customers during absolutely necessary conditions. The most common example of emergency sources are interconnects from other systems that are used when the system’s normal source of water may not meet normal capacity. There is a fifth category of ‘Other’ for any activity of a source that does not fit the aforementioned descriptions. You do not need to list any inactive sources, for the omission from this table will indicate sources not currently used by the system.

Many systems will have more than one source of water. Click the button labeled ‘Click here to add additional source’ to add a new row with the same information to complete. To add multiple rows at once, click the button labeled ‘Click here to add five additional sources’. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.
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Does this water system purchase water from another water system?: If the system purchases any water from another public water system, indicate this by checking ‘Yes’ and proceed to complete the next table. If your system does not purchase any water, select ‘No’ and move down to the next section ‘Water Treatment Details’.

B.2. Purchase Water Sources

Fill out the table with further details about your purchased water interconnect. Along with the name of the providing system, give the location of the master meter, water type, whether the water is provided as raw or treated, and the availability based on the same five categories as the above subsection. The master meter location should be an address or description of physical location. The type of water will be one of three choices: GW for groundwater, SW for surface water, or GUI if the water is groundwater under the influence of surface water. Indicate if the water received has not been treated and has no residual (raw), or if the prior system has injected some sort of treatment before it reaches your system (treated).

Click the ‘Click here to add additional source’ button if you have more than one interconnect and need additional rows to list this information. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

Section C: Water Treatment Details

Purpose of section

The disinfection process within each public water system may be determined by the type of source water a system uses, but will also influence compliance figures and certain sampling a system must comply with. A system treating raw surface water will have more steps in their overall disinfection process than a system treating groundwater from a well. The entirety of a system’s water treatment is vital in ensuring their customers the water is safe for human consumption, and listing all steps is key for the TCEQ to setup schedules and run compliance based off this information. However, the full treatment process for some systems may be as simple as injecting gas chlorine at one location before storage. This would still be viewed as a treatment plant since it involves the treatment of water though it may not be a large treatment plant facility.

C.1. Treatment Flow

List your system’s treatment plants one at a time until all plants / injector locations have been transcribed. Each plant, similar to all other water facilities, is assigned a specific TCEQ ID number that is unique to the facility. Treatment plants are given the ID format of “TP####”. A plant may be fed by a single source or all of a system’s active sources – indicate which sources identified by Source ID that feed each plant the system actively uses. If you need another table for more than one treatment plant, click the ‘Add Treatment Plant’ button below the entirety of the treatment flow table. If you have accidentally added more treatment plant tables than necessary, the ‘X’ button found in the top-left corner of each table will erase the table it is fixated within.
Specifically for surface water or groundwater under the influence of surface water systems, their treatment plant(s) will have multiple disinfection zones that start and end at specific injection points. These systems will already have an approved contact time (CT) study listing this information. The most left-hand column needs to list all disinfection zones in ascending order starting with "D1". Disinfection zones need to have all treatment processes occurring within them in the adjacent column in the order they occur, separated with commas. To provide another row to list more disinfection zones, click the 'Click here to add additional disinfection zone' button. If you have added too many rows, click the '-' button found at the very beginning of any row.

Not every system will add treatment to the water within their system, especially those that distribute strictly raw water to customers or smaller systems that receive already treated water containing a strong residual. If your system only one has disinfection step, simply list this step within the treatment process column.

Section D: Entry Point and Distribution Details

Purpose of section

After the treatment process, water within a system will make its way toward the distribution system and the customers. An entry point is not a fixed location, per say, but it is defined as a location after treatment and before the first connection. Any water feeding into the distribution system needs to have an associated entry point and certain samples collected at the entry point to ensure water delivered at the take point is safe for human consumption. Part of this section aides both TCEQ and the system in understanding how many entry points a system contains, and thus the particular sample schedules required for compliance purposes.

In keeping up with demand a system may store water before distribution, throughout distribution, or both. Water storage may come in the form of the following: ground storage tanks, elevated storage tanks, standpipes, clearwells, pressure tanks, and elevated ground storage tanks.

Certain details of a system’s distribution system can be beneficial in determining sanitary defects or other problems occurring within a system. Pressure planes contain unique characteristics depending on the variation of pressure and if they are isolated or interconnected. Booster disinfection can increase the chance of disinfection byproducts forming as a side effect of increasing the residual to the far reaches of the system. This information is pertinent in the ability to minimize the overall effects caused by total trihalomethanes (TTHM) and haloacetic acids (HAA5). Systems receiving water from your supply may have issues passed along to their system that causes them to be out of compliance if a defect exists within your system. It is key to not only know this information yourself but also to pass information along to applicable recipients based on the location of any issues.

D.1. Entry Points

Within the first column of the table, enter your assigned TCEQ ID for each active entry point your system currently contains. The ID will be in the format of “EP###” and in ascending order based on the number of entry points a system has had throughout their history. Once an entry point is activated, the ID remains
with it even if the entry point is deactivated – ID’s can never be recycled. Enter all sources by their Source ID that feed into each respective entry point. The entry point location should be an address or relative physical location while the sampling location is intended to be the actual sample location, such as “tap on storage tank”, “lab sink”, etc.

If your system has more than one entry point, click the ‘Click here to add additional entry point’ button to add a new row to input the respective information for additional entry points. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

D.2. Water Storage Facilities

List the physical address for each water storage facility. Choose the type of storage from the drop-down list (possible choices are also listed in the above paragraph). List all sources by Source ID that contribute to each particular storage facility. If you have more than one storage facility, click the ‘Click here to add additional water storage facility’ to add a row or if you have many facilities you need to add you can click the ‘Click here to add five additional water storage facilities’ button to add five rows at once. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

D.3. Distribution Details

Does the system have more than 1 pressure plane?: Answer ‘Yes’ if your system contains more than one pressure plane or ‘No’ if the system does not. If ‘No’, move along to the next table about boost disinfection. If ‘Yes’, fill in details within the pressure plane table. Give the pressure plane name, which may be as simple as a numerical value or it may be based on the general area. Indicate whether the pressure plane is ‘Independent’ or ‘Interconnected’ with another pressure plane, and list which pressure plane(s) it is interconnected with. Be sure to also list which entry point via entry point ID the pressure plane is associated. If you need additional rows, click the ‘Click here to add additional pressure plane’ button. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

Does the system booster disinfect in distribution?: Answer ‘Yes’ if your system booster disinfects within the distribution system or ‘No’ if the system does not boost disinfect. If ‘No’, move along to the next table about wholesaling to other systems. If ‘Yes’, give the address of the booster disinfection point. List the type of disinfectant used, either free or total, and if applicable the pressure plane in which it is located. If you need additional rows, click the ‘Click here to add additional booster disinfection location’ button. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

Does this water system sell water to any other public water system?: Answer ‘Yes’ if your system sells water to another public water system or ‘No’ if the system does not sell water to another system. Provide basic information for each system you sell to including ‘PWS ID’ and ‘PWS Name’. Indicate whether the water provided is either ‘Raw’ untreated water or if you are providing ‘Treated’ water. Provide the (X,Y) coordinates as well as the physical address of the master meter for the respective interconnect. If you need additional rows, click the ‘Click here to add
Appendix A. Monitoring Plan Template Instructions

Include any additional information about your distribution system in the space provided that might be pertinent in reviewing the system’s monitoring plan. This can be any information not previously mentioned in the questions and details above, such as: the overall shape or environment of your distribution, current or future construction that might affect part of your system, additional descriptions of the details previously listed, etc.

Section E: Surface Water Treatment Rule

Purpose of section

The Surface Water Treatment Rule (SWTR) is designed to aide systems treating surface water, or groundwater under the influence of surface water, in providing safe water to their customers for human consumption. Having all compliance sampling under the SWTR in one section will benefit new and old operators alike. Raw water sampling as well as treated water samples being in the same place will help operators better understand all rule requirements and how their system remains in overall compliance with the rule. Information listed in this section also provides clarification on the specific requirements a system may have depending on their size, population, and equipment. Subsections such as Total Organic Carbon (TOC) monitoring may change from time to time so be sure to update how the system complies with the rule.

E.1. Disinfection Zones

Read the statement mentioning disinfectant residual, pH, temperature, and flow rate sampling within each disinfection zone. Fill out the disinfection zone column identical to the table found in Section C: Water Treatment Details. The most left-hand column needs to list all disinfection zones in ascending order starting with ‘D1’. Disinfection zones need to have their physical sampling location and how often samples are pulled listen in the respective row. To provide another row to list more disinfection zones, click the ‘Click here to add additional disinfection zone’ button. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

E.2. Turbidity

Review the filter record information for both Combined Filter Effluent (CFE) and Individual Filter Effluent (IFE) to ensure your system is meeting the minimum requirements. If your system uses cartridge filtration do not complete the turbidity table unless you have consulted with the TCEQ beforehand. Otherwise, proceed to list your first treatment plant by its TCEQ ID in the format of “TP#####”. For each treatment plant declare the ‘Number of samples per day’ taken, whether the analysis is an ‘On-line analyzer’ or ‘Bench-top method’, and a description of the ‘Sampling point’ for both CFE and IFE. If you have more than one treatment plant, click the ‘Click here to add additional treatment plant’ button. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.
The first text box allows you to describe your plan for turbidity monitoring if for any reason it varies from traditional monitoring. Describe the process and the operational issues that make it different.

The next box asks for the quality assurance / quality control (QA/QC) procedures followed to confirm the analysis of turbidity sampling is accurate. The TCEQ will review all QA/QC processes described to make sure turbidity sampling is accurate and correct.

**E.3. Entry Point Disinfectant Residual**

Read the paragraph describing disinfectant residual monitoring. Particularly important information highlighted in this paragraph is the emphasis on continuous entry point monitoring versus grab samples. Smaller systems have the option to continuously monitor or take grab samples according to the table shown.

In the first column of the entry point residual monitoring table, enter your system’s treatment plant identified by its unique TCEQ ID in the format of “TP#####”. Identify the minimum disinfectant residual figure at the entry point – 0.2 mg/L if your system measures free chlorine or 0.5 mg/L for total chlorine. For each treatment plant, also identify the sampling frequency in the details of ‘Number of samples per day’, whether the analysis is an ‘On-line analyzer’ or ‘Bench-top method’, and if the monitoring is ‘Continuous’. If you have more than one treatment plant, click the ‘Click here to add additional treatment plant’ button. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

**E.4. Long Term 2 Source Water Monitoring**

A brief paragraph informs systems of the timeframe for LT2 sampling, which all surface water and GUI plants must perform. Consult with the TCEQ if you have a new source and associated treatment plant or if you are a new system under this regulation.

Enter the BIN classification number of your treatment plant in the ‘Long Term 2 Bin classification (1-4)’ field. This classification number will be a number between 1 and 4 assigned to the specific treatment plant based on results from the first round of sampling. If you have more than one treatment plant, click the ‘Click here to add additional treatment plant’ button. If you have added too many rows, click the ‘-’ button found at the very end of any row.

**E.5. Total Organic Carbon (TOC)**

Does the system conduct monthly TOC monitoring?: Answer ‘Yes’ if the system conducts monthly TOC monitoring or ‘No’ if the system does not. All systems must comply with the reporting requirements for the TOC rule, but only conventional systems must meet the compliance figures. Review the information provided in taking samples according to Step 1, Step 2 or any of the eight Alternative Compliance Criteria (ACC). Treated TOC samples need to be taken no earlier than an hour after the raw TOC is collected, but cannot be later than 8 hours after collecting the raw sample.
In the TOC sample set table, give a physical description of the ‘Sampling Location’ and indicate how many ‘Samples per month’ are taken for raw TOC, raw alkalinity, and treated TOC. These three samples combined make-up a complete TOC sample set.

If your system meets one of the eight ACC instead of Step 1 or Step 2 removal, select the criteria followed for compliance. If meeting Step 1 or Step 2 removal, skip this table and move on to E.6. Treatment Technique (TT) Compliance Determination.

**E.6. Treatment Technique (TT) Compliance Determination**

Read the short paragraph to understand how compliance is maintained in reporting treatment techniques to the TCEQ.

**Acute TT Violations**

Indicate if your system uses membrane filtration by selecting ‘Yes’ or if you are a conventional system that does not use membrane filtration select ‘No’. Information relating to membrane filters will remain shown if the system is unconventional but disappear if not.

Indicate if your system uses conventional filtration by selecting ‘Yes’ or if your system uses an unconventional method of filtration select ‘No’. Information relating to conventional filtration will remain shown if the system is conventional but disappear if unconventional. The answer to this checkbox is opposite to the answer given in the above choice.

**Non-acute TT Violations**

Review the different ways a system may receive a non-acute treatment technique violation.

**Section F: Groundwater Rule (GWR)**

**Purpose of section**

The Groundwater Rule (GWR) establishes criteria for systems treating groundwater to follow in order to ensure safe water to their customers for human consumption. It is important to follow the minimum requirements of the GWR to avoid the spread of any found sanitary defects. Compliance for any two separate systems following the GWR may look completely different based on size of the system, number of groundwater wells, if the system has 4-log treatment, and if conditions exist that lead the TCEQ to believe they may be susceptible.

**F.1. Triggered Source Monitoring (TSM)**

Does the system have a TCEQ approved triggered source monitoring plan?: Answer ‘Yes’ if your system has worked with the TCEQ in achieving an approved Triggered Source Monitoring Plan (TSMP) or ‘No’ if otherwise. Approval for these plans comes strictly from the GWR compliance officer and not the monitoring plan coordinator. If
‘Yes’, please attach a copy of your approved TSMP. If ‘No’, be familiar with the information provided below the question and move along to the next subsection.

**F.2. Compliance Monitoring for 4-log (Inactivation of Viruses) Treatment**

Has your system received TCEQ approval to use 4-log treatment?: Answer ‘Yes’ if your system has received approval for 4-log treatment or ‘No’ if your system has not received approval or if you do not use 4-log treatment. If ‘Yes’ read the information below the question for requirements that apply to your system, and then complete the residual monitoring for 4-log compliance table. If ‘No’ the subsequent text will collapse and you can proceed to F.4. Assessment Source Water Monitoring.

Within the first column of the residual monitoring for 4-log compliance table, list your first source in the format of “#PWSID#”. The first unique value will be based on the type of the source, which in this case will be ‘G’ for groundwater wells. Any active source will have a Source ID approved by the TCEQ and displayed on Drinking Water Watch. The second unique value depends on the order of the source sorted by the type. For instance, if a system has two groundwater wells the Source ID’s would be ‘G1234567A’ and ‘G1234567B’. In the next column physically describe the ‘Sampling Location’ such as ‘tap on well head’. For the minimum specified residual, indicate the minimum value in ‘mg/L at entry point’ and whether the residual is ‘Continuously monitored’ coupled with a grab sample ‘Monitored at peak daily flow’. If you need to list more than one source, click the ‘Click here to add additional source’ button. If you have added too many rows, click the ‘-‘ button found at the very beginning of any row.

**F.3. Compliance Determination for 4-log Treatment**

This section only applies to the systems that checked ‘Yes’ under F.2. Compliance Monitoring for 4-log (Inactivation of Viruses) Treatment.

Check the appropriate box whether your system serves a population of ‘greater than 3,300’ or if you serve ‘3,300 or fewer’ according to the most recent data you have. Be sure to carefully examine the statement that follows as it changes based on the answer given for population served.

**F.4. Assessment Source Water Monitoring**

Since not every system will be required to conduct Assessment Source Monitoring (ASM), read the brief introduction paragraph to have a better idea of the systems that are required to perform ASM.

Is the system required to conduct assessment monitoring?: Answer ‘Yes’ if your system is required to perform ASM or ‘No’ if your system is not required to perform ASM. If ‘Yes’ continue to complete the required information about your ASM sampling. If ‘No’ the subsequent table will collapse and you can proceed to F.5. Treatment Technique (TT) Compliance Determination.

Indicate in the fields provided the ‘Begin date’ and the ‘End date’ for your ASM sampling. All groundwater wells need to be listed in the field labeled ‘List of sources to be monitored’ and in the format of “#PWSID#”. The first unique
value will be based on the type of the source, which in this case will be ‘G’ for groundwater wells. Any active source will have a Source ID approved by the TCEQ and displayed on Drinking Water Watch. The second unique value depends on the order of the source sorted by the type. For instance, if a system has two groundwater wells the Source ID’s would be ‘G1234567A’ and ‘G1234567B’. In the next field please indicate the ‘Number of samples required at each source’ for your ASM sampling. Do not give a total number for the span of your ASM sampling, but rather list the number of samples required at the frequency designated under ‘Monitoring frequency required’. The two choices are monthly and quarterly, so if your system takes one sample a month you would enter the numerical value of “1” into the samples required and select “Monthly” from the drop-down list for required frequency.

Is the monitoring a requirement of rule exception?: Answer ‘Yes’ if your ASM sampling is a result of a rule exception your system currently has or ‘No’ if it is not due to an exception. If ‘Yes’ continue to complete the required information about the exception. If ‘No’ the subsequent table will collapse and you can proceed to F.5. Treatment Technique (TT) Compliance Determination.

Give the ‘Date of exception approval letter’ in the appropriate field – the system should have a letter from the TCEQ informing them of their required ASM sampling due to an exception. The letter should also state the rule this is an exception to, which goes in the corresponding field ‘Exception to which rule’.

**F.5. Treatment Technique (TT) Compliance Determination**

Review the different ways a system may receive a treatment technique violation under the GWR.

**Section G: Revised Total Coliform Rule (RTCR) and Disinfectant Residual**

**Purpose of section**

The Revised Total Coliform Rule (RTCR) establishes a “find and fix” approach to coliform-friendly environments within your public water system. This section of the monitoring plan template gives an overview of the new requirements under the rule revisions that took effect in April 2016. All public water systems are required to maintain a Sample Siting Plan (SSP) as an attachment to their monitoring plan as it is a separate form used to document a system’s coliform sample locations. Systems can also review how they may remain in compliance under the new revisions which are different from the previous paths to compliance.

Closely associated with coliform sampling is the disinfectant residual sampling taken in the distribution system. Sample locations are typically the same as the coliform sample locations since the criteria for both respective samples overlap. Some systems will have additional locations taken for a residual but not for bacteriological samples, which can be listed here since the SSP does not offer this option. Aside from general compliance information this section will also be used for compiling all other treatment information into the same area. For systems actively using chloramines or chlorine dioxide, there are compliance samples to be taken at
certain locations and frequencies. A Nitrification Action Plan (NAP) is a required attachment to the monitoring plan for systems using chloramines in the treatment process.

**G.1. RTCR Sample Siting Plan (SSP)**

Read the entire subsection to gain an understanding of what is required in the SSP as well as sample analysis for compliance purposes. If you have not completed a SSP you can find a blank copy at the following address: https://www.tceq.texas.gov/drinkingwater/microbial/revised-total-coliform-rule. Upon completion, immediately send a copy to the TCEQ’s central office in Austin and maintain the plan as an attachment to your overall monitoring plan.

**G.2. RTCR Compliance Determination**

Read the beginning paragraph for background information before progressing to the question in this section.

How many samples does the water system collect every month?: Answer ‘**Less than 40**’ if your system takes less than 40 coliform samples within a single month, or answer ‘**40 or more**’ if your system is a larger system and takes at least 40 coliform samples in a month. Based on which option you choose, the section just below will update to include the final compliance statement.

**G.3. Disinfectant Residual Monitoring in the Distribution System**

Read the introduction paragraph to understand the correlation between coliform sampling and the disinfectant residual. This paragraph also gives all compliance figures to lay the foundation of how a system remains in compliance with their residual results.

**Disinfectant used**

Answer ‘**Chlorine**’ if your system only uses free chlorine and does not use chloramines in the treatment process. The minimum allowable limit at any time for measuring free chlorine is 0.2 mg/L. Answer ‘**Chloramines**’ if you inject liquid ammonia sulfate (LAS) to mix with chlorine forming chloramines. Systems monitoring for total chlorine must have a minimum residual of 0.5 mg/L at all times to remain in compliance.

**Residual monitored**

Answer ‘**Every seven days**’ if you are a small groundwater or purchased-water system that contains less than 250 connections and serve a population less than 750. If you are a surface or GUI water system, or either contain at least 250 connections or serve at least 750 people, answer ‘**Daily**’ as these systems must monitor the disinfectant residual in their distribution system every day.

Check the next box only if all locations sampled for disinfectant residuals are the exact same as those listed in the system’s RTCR Sample Siting Plan. Once checked, the following table will disappear and you can proceed to section G.4. Alternative
Disinfection Monitoring. If there are any locations where a residual is taken that are not listed in your plan, do not check the box.

List the ‘Sampling Frequency’ for each additional ‘Sampling Location’ a residual is taken. If you have more than one additional location, click the ‘**Click here to add one additional sampling location**’ to add a row or if you have many locations you need to add you can click the ‘**Click here to add five additional sampling locations**’ button to add five rows at once. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

**G.4. Alternative Disinfection Monitoring**

**Chloramines**

Check ‘**Yes**’ if your water system measures total chlorine / has chloramines in the distribution system, or ‘**No**’ if your system measures free chlorine and does not have chloramines in the distribution system. If you checked ‘**Yes**’ fill out the corresponding table with basic information from your Nitrification Action Plan (NAP). Include your NAP as an attachment to the monitoring plan. If ‘**No**’ the table will collapse and you may proceed to the next question about any alternative disinfection monitoring within your system.

**Chlorine Dioxide**

Check ‘**Yes**’ if chlorine dioxide is used as part of your system’s overall treatment process or ‘**No**’ if you do not use chlorine dioxide at all. If ‘**Yes**’, also check the box if you are currently ‘**Submitting ClO₂MOR?**’ - all systems using chlorine dioxide need to be submitting operating reports on a monthly basis. Continue to the fill out all required information if you did check ‘**Yes**’ or move on to Section H if you checked ‘**No**’.

After reading the overarching principle for chlorine dioxide samples, check whether the ‘**System re-chlorinates in distribution**’ or ‘**System does not re-chlorinate in distribution**’. This question asks if you boost the residual within your distribution system by adding chlorine treatment after the entry point or not. Depending on which option is selected, only one table will remain visible for the system to complete. For systems that re-chlorinate the “three sample set” must be at different locations within the distribution system, while the sampling location will be the connection closest to the treatment plant for all three samples if the system does not re-chlorinate.

Fill out the ‘**Sampling Location**’ and ‘**Sampling Frequency**’ for both the entry point chlorine dioxide sampling as well as the distribution samples. Make sure the sample set follows the requirements listed just above the table if you re-chlorinate. If you need to list more than one entry point containing water treated with chlorine dioxide, click the ‘**Click here to add one additional entry point**’ button. If you have added too many entry points, click the ‘**Click here to remove one additional entry point**’ button found in red just below the button to add an entry point.
Section H: Inorganic, Organic and Radionuclide Rules

Purpose of section

This section encompasses all of the entry point sampling along with the distribution asbestos sample collected by a TCEQ contractor for compliance purposes. The entire sweep of entry point analytes a contractor could possibly take samples of are listed to help systems understand and keep track of what is being taken at their entry point(s). The majority of items listed are individual analytes, and of those most are selected ‘No’ by default since the entire second column of analytes are only monitored on a case-by-case basis if abnormal levels exist instead of the routinely taken analyte groups.

Information relating to schedule changes from elevated levels for inorganic, organic and radionuclides can also be found in the later part of this section. Systems are not notified of an exceedance if their bill to the laboratory is not paid so it is critical to pay any outstanding bill to stay informed of what is in your water. Using the data from the lab report coupled with the information in this section, a system can know what their future schedule will be for that particular type of analyte.

H.1. Inorganic Monitoring Requirements

Check ‘Yes’ for any analyte or analyte group sampled on behalf of the system by a TCEQ contractor, or ‘No’ if the system is not sampled for that particular analyte or analyte group. Use information from Drinking Water Watch (DWW) to complete this table and subsequent sections. When viewing DWW, be sure to review both the “Group Non-TCR Sample Schedules” and the section below labeled “Individual Non-TCR Sample Schedules”. Transient systems will have some of the same analytes monitored as community and non-transient non-community systems under a separate group called “Secondaries”. If your water system is classified as a transient non-community system, select ‘Yes’ for the appropriate row and fill out the correct schedule down below. In the second column, only check ‘Yes’ if your system is specifically sampled for any of the individual analytes listed as they are not routinely collected. Leave them marked ‘No’ if none of these samples are collected. Depending on which rows have ‘Yes’ checked, the next table will auto-populate with the appropriate fields.

Fill out the respective ‘Entry Point(s)’, ‘Frequency’ and any ‘Additional Comments’ for each analyte(s). Each schedule per entry point needs its own row of information. If your system contains more than one entry point, click the ‘+’ button located within the first column at the very beginning of each row. If you have added too many rows, click the ‘-’ button found at the end of each row. For the ‘Entry Point’ field, enter the TCEQ ID in the format of “EP###” with only one entry point being in each row. Select the frequency for each analyte or analyte group based on the available options. Space is provided if a system wishes to add ‘Additional Comments’ for any pertinent information such as why the current schedule exists, last sample taken, etc. The last section of this table is dedicated to asbestos monitoring and this sampling occurs within the distribution system rather than an entry point. Indicate the ‘Frequency’ that asbestos samples are taken for your system along with the address of the ‘Distribution Sampling Location’.
H.2. Organic Monitoring Requirements

The tables in this section are visible by default, but a ‘Show Table’ option is available in case systems accidentally select the ‘System is not sampled for’ option when they do in fact have these groups sampled at their entry point(s). If your system does not have any samples collected for organic contaminants, select the ‘System is not sampled for SOC/VOC’ and ‘System is not sampled for SOC Methods’ options and move along to H.3. Radionuclide Monitoring Requirements.

In the ‘Entry Point Organic Sampling Schedules’ table, enter your system’s first entry point via TCEQ ID in the ‘Entry Point ID (s)’ column. Select the correct ‘VOC Sampling Frequency’ and ‘SOC5 Sampling Frequency’ in the following columns for that respective entry point. If your system contains more than one entry point, click the ‘Click here to add one additional entry point’ button. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

The next table labeled ‘Entry Point SOC Method Sampling Schedules’ should be filled out similarly to the previous table. The ‘Entry Point ID (s)’ column needs to list the system’s first entry point by means of their assigned TCEQ ID, with the trailing fields of ‘SOC Method 504’, ‘SOC Method 515’ and ‘SOC Method 531’ selected with the correct schedules for the entry point according to DWW. Though the separate methods might be on different schedules, a system will either be sampled for all three or none at all. If your system contains more than one entry point, click the ‘Click here to add one additional entry point’ button. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

H.3. Radionuclide Monitoring Requirements

If your system does not have any samples collected for radionuclides, select the ‘System is not sampled for Radionuclides’ option and move along to H.4. Increased Monitoring Requirement. If you accidentally hide the Radionuclide table, select the ‘Show Table’ option to make the required table reappear.

In the ‘Entry Point Rad Sampling Schedules’ table, enter your system’s first entry point identified by its TCEQ ID in the ‘Entry Point ID (s)’ field. Select the correct ‘Combined Radionuclide Sampling Frequency’ in the following column for that respective entry point. If your system contains more than one entry point, click the ‘Click here to add one additional entry point’ button. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

H.4. Increased Monitoring Requirement

Review the scenarios mentioned in the event your system ever has an exceedance for inorganic, organic, or radionuclide samples. Each category of chemicals has their own criteria for increasing a system’s schedule to quarterly sampling and returning to compliance.
H.5. MCL Compliance Determination

Read over each statement to understand how your system can return to compliance in the event of an MCL exceedance.

Section I: Disinfection Byproducts Rule

Purpose of section

Stage 2 of the Disinfection Byproducts Rule came into effect on October 1, 2013 for some systems and on October 1, 2014 for the rest. It builds off of the initial data found during Stage 1 as well as Initial Distribution System Evaluation (IDSE) sampling. The biggest change from the first stage to the second is that compliance is based off of location-specific results instead of it being applied as a whole across the entire distribution system. Along with total trihalomethanes (TTHM) and haloacetic acids (HAA5), other byproducts may form within the distribution system and pose a health risk to any consumers. For systems using chlorine dioxide as part of their treatment process, a three-sample set must be taken in the distribution system to monitor the levels of chlorite at the connection closest to the treatment plant, a location at the system’s farthest reach, and a third location roughly located in the middle of the previous two locations. For systems using ozone at a treatment plant, bromate must be monitored at the respective point of entry to the distribution system at least once a month. Section I of the monitoring plan template provides this all-inclusive section to keep track of all possible byproducts of treatment a system may have to monitor.

I.1. Stage 2 Disinfection Byproducts

From the ‘Monitoring Frequency Required’ dropdown list, select the frequency which DBP Stage 2 samples are collected at your system. All systems except for transient non-community systems are required to have DBP Stage 2 samples collected and therefore need this field, and subsequent table, filled with applicable information.

In the first field of the ‘Stage 2 TTHM and HAA5 Sampling Sites’ table, identify each sample location by the ‘Site ID’ in the format of “DBP2-##”. The specific ID for each location can be found on the Sample Points page on DWW. List the ‘Address’ and ‘Coordinates’ (if known) for each ‘Sample Site Location’ mentioned in the table. Be sure to indicate whether each sample location is sampled for ‘Both’ disinfection byproducts or if a location is only sampled for ‘TTHM’ or ‘HAA5’ only. If your system contains more than one sample location, click the ‘Click here to add additional sampling location’ button. If you have added too many rows, click the ‘-’ button found at the very beginning of any row.

I.2. Other Disinfection Byproducts

Answer ‘Yes’ if your water system uses chlorine dioxide as a treatment option, and therefore monitor chlorite, or ‘No’ if chlorine dioxide is not used in your system. If ‘Yes’, complete the subsequent ‘Chlorite Sampling Plan’ table for each applicable treatment plant. If ‘No’, the table located below the question will collapse and you
can proceed to answer the next question about using ozone and monitoring bromate.

In the first row of the ‘Chlorite Sampling Plan’ table, enter the TCEQ ID for the first ‘Treatment Plant’ that utilizes chlorine dioxide as treatment. Any ID for your treatment plant(s) can be found on DWW through the Water System Facilities page. For each treatment plant complete the respective sub-table starting with the 'Sampling Location' and 'Sampling Frequency' for measuring chlorite at the entry point. The 'Sampling Location' needs to indicate which entry point, identified in the format of the assigned ID “EP###”, and how often chlorite is monitored at the entry point. Next, list the three sample locations that make up the three-sample set within the distribution system: 'Nearest connection to the plant', 'Middle of the distribution system' and 'Farthest reach of system'. If more than one treatment plant utilizes chlorine dioxide, click the 'Click here to add one additional chlorite sample plan' button. If you have added too many instances of the plan, click the 'Click here to remove one additional chlorite sample plan' button found in red just below the button to add a chlorite sample plan.

Answer ‘Yes’ if your water system uses ozone as a treatment option, and therefore monitor bromate, or ‘No’ if ozone is not used in your system. If ‘Yes’, read the text box and indicate how many samples are taken with a given month for bromate. If ‘No’, the information located below the question will collapse and you can proceed to the next subsection, I.3. DBP2 Increased Monitoring Requirement.

I.3. DBP2 Increased Monitoring Requirement

Read the brief paragraph in regards to a system’s schedule should an exceedance occur while on a reduced schedule.

I.4. DBP2 MCL Compliance Determination

Read this entire subsection to gain an understanding of how to remain in compliance with all disinfection byproducts: TTHM, HAA5, chlorite and bromate.

Section J: Lead and Copper Rule

Purpose of section

The Lead and Copper Rule is designed to help identify locations vulnerable to any exposure of lead and copper. Depending on the year and construction material of a building, it may be more susceptible to contamination of the water running through the pipes. Part of this section is an excerpt of the Sample Site Selection Pool Form (TCEQ Form 20467) required for all applicable systems to complete and submit to the lead and copper team. This form walks systems through the process of identifying which tier a sample location might fall into, therefore containing the most susceptible locations in the sampling pool and if contamination is occurring. It is critical for compliance purposes to maintain your lead and copper samples with the same locations and in the same order as reported to the lead and copper team. Information regarding how a system falls out of compliance and the required actions to take are also located within this section.
Appendix A. Monitoring Plan Template Instructions

J.1. Lead and Copper Tap Monitoring

Fill in the ‘Number of Sampling Sites Required’ field with the total number of sites your system is required to have in its sampling pool, not just the total number of sites being sampled. Select one of the frequencies from the ‘Monitoring Frequency Required’ dropdown list indicating how often your system is currently set to sample for lead and copper. Proceed to read the paragraph detailing how to select your sampling pool based on tiers, followed by the descriptions of each tier.

Since all systems should have a completed Sample Site Selection Pool Form, copy the sample locations from that form into the ‘Lead and Copper Tap Monitoring Sampling Sites’ in the same order. The ‘TCEQ Site ID’ field should have ID numbers in the format of “LCR###” only. The locations paired to each number should also match your previously submitted Sample Site Selection Pool Form – if you need any assistance you may call the lead and copper team at (512)239-4691 for the list of all your system’s sample locations in our database. If you have more than five sample locations to list, click the ‘Click here to add an additional sampling location’ button, or the ‘Click here to add five additional sampling locations’ button if you need to add several at a time. If you have added too many sample location rows, click the ‘-’ button found at the very beginning of any row.

Be sure to read and include all information requested in the space provided in regards to sample collection procedure and what lab the system uses for sample analysis. It is imperative to include the name of the accredited lab chosen by the system.

J.2. Increased Monitoring Requirement

Read the brief paragraph in regards to a system’s schedule should the system be new or an action level exceedance per the 90th percentile occur while on a reduced schedule.

J.3. Action Level Exceedance Determination

This subsection describes how a system is determined to be in exceedance and the actions that must be taken should an action level be exceeded.

Section K: Additional Monitoring: Rule Exceptions

Purpose of section:

This section is included in the monitoring plan template if your public water system has any rule exceptions not previously discussed or listed within the monitoring plan template. Exceptions covered up to this point in the template are the main rule exceptions dealt with by the TCEQ, but there are still a number of exceptions to the rules a system may be granted.

K.1. Rule Exceptions

For the rule exception, find the letter sent on behalf of TCEQ and list the date at the top of the first page in the ‘Date of exception approval letter’ field. The letter will discuss several key items to be filled out in the appropriate field in the
Appendix A. Monitoring Plan Template Instructions

After indicating the ‘Exception to which rule’ the letter is for, details will ensue discussing the ‘Type of sample to be analyzed’ and the particular ‘Sampling Location’ this is to be taken. ‘List of sources to be monitored’ represented by the sampling location mentioned in the field above. Last of all pertinent fields is to indicate the ‘Frequency of sampling’ along with the ‘Start date’ and ‘End date’ of this sampling.

If you have more than one additional exception to list, click the ‘Add another rule exception’ button located below the entire segment of exception information to list. If you have added too many rule exceptions, click the ‘X’ button found in the top-left corner of any segment above the ‘Date of exception approval letter’ field.

Section L: Laboratory Information

Purpose of section

All public water systems, regardless of source or system type, need to complete a Laboratory Approval Form if analyzing water samples in any capacity for the analytes listed within the form. The difference between accreditation and approval is discussed to help systems understand why this form may be required for their system. Accredited laboratories used for compliance purposes are listed for convenience or if any system needs to contact one of the labs with questions in regards to the contractor-collected samples. Along with the actual form to fill out, instructions discuss in detail how to complete all aspects and fields necessary before submitting to the TCEQ. The form itself can be found on the fourth page of this section and can be submitted either separately or along with the system’s monitoring plan. The form needs to be physically signed by the operator or analyst in charge of the system’s analysis. A table at the end of the section lists all approved methods, calibration frequencies and minimum accuracies unique to each analyte within the form.

L.1. Laboratory Information

Read the opening paragraphs for an understanding of an approved lab versus an accredited lab and information on how to find out more about each. Accredited laboratories used for compliance purposes by the TCEQ are listed down below the laboratory information tables.

For the ‘Primary Laboratory’ field, fill in the laboratory that analyzes the TCEQ contractor-collected samples for entry point and distribution system samples. Currently, this lab should be either the Department of State Health Services or the Lower Colorado River Authority. The bill invoice for the samples will contain the name of the lab running the analysis. Fill in the required fields of ‘City’, ‘State’, ‘Zip’, ‘Phone’, ‘Ext.’ and ‘Fax’ using the information already given for that particular lab.

Complete the ‘Alternate Laboratory’ table for a laboratory your system contracts out to for any other analyses. In the same fashion as the above table for the primary laboratory, list the ‘City’, ‘State’, ‘Zip’, ‘Phone’, ‘Ext.’ and ‘Fax’ of the system’s alternate laboratory. If you have more than one alternate laboratory, click the ‘Add Alternate Laboratory’ button located below the entire ‘Alternate
Laboratory’ segment. If you have added too many alternate labs, click the ‘-’ button found in the top-left corner of any segment above the ‘Alternate Laboratory’ field.

Carefully read each topic on the instructions page that introduce who the form applies to, when it needs to be submitted, approved-lab analytes included on this form and accredited-lab analytes not included on this form. Systems who perform analysis for any of the analytes listed under “Approved-Lab Analytes”, even if it is simply monitoring the concentration of chlorine within their system, need to complete this form and submit it to the TCEQ.

The third page of this section guides systems in completing the form correctly. Go through each subject matter to understand what information to list on the form in each respective column. For additional assistance, you can always reference an instrument’s manual for any analysis information including approved EPA method, minimum accuracy and calibration requirements. The table at the end of this section will also include ample information to assist systems in completing the form. You may submit the form any of the three ways listed so long as the form is complete and has been signed by an appropriate staff member.

On the Drinking Water Lab Approval Form, indicate the ‘Laboratory or Plant Name’ in the first field – this can be the same as the name of your public water system. In the ‘PWS ID (TCEQ Issued)’ field give your seven-digit PWS ID followed by your assigned ‘Lab ID No.’. The lab ID number is given through the approval/accreditation process so if you have never submitted this form before you may leave this blank and an ID will be assigned for you. The next few fields require the ‘Address’, ‘City/State’ and ‘Zip’ of the laboratory facility, or office if the system has no official laboratory building. The ‘Contact Name’ should be the person most knowledgeable of the system and monitoring the analytes listed on the form. For the contact listed provide the best ‘Email’ and ‘Phone’ in case they need to be contacted. Select the ‘Date form completed’ from the dropdown calendar that appears once selecting the field. If your system/personnel only monitor and run analysis for your system, then after the ‘Does this lab perform analyses for other Public Water Systems?’ question select the ‘No’ option. If there is overlap for any of these analytes with another public water system, select ‘Yes’.

Analytes and Methods

- **Analytical Method**: From each dropdown menu, select the approved EPA method under which the analysis for the specific analyte in that row is run.
- **Instrument Name**: Provide the name of the actual instrument used for analysis to the best of your ability.
- **Accuracy**: Enter the minimum accuracy of the instrument in the appropriate units already provided. The required minimum accuracies for each analyte can be found in the table at the end of the section.
- **Calibration Frequency**: Indicate how often the instrument used for analysis is calibrated or its accuracy verified.
- **Calibration Method**: In addition to the frequency, indicate the particular way the instrument is calibrated. Certain analytes must be calibrated a certain way – for more information see 30 TAC §290.46(s)(2).
- **NELAP Accredited**: Select ‘Yes’ if your laboratory or the laboratory used is accredited for that particular analyte, or ‘No’ if not accredited. Attach a copy of the accreditation if any of the analytes have ‘Yes’ selected in this column.
- **PT Study**: If ‘Yes’ is selected in the “NELAP Accredited” column, select ‘Yes’ from the dropdown and include copies of the Proficiency Test (PT) Study every six months.

In the ‘Lab Analyst or Operator’s Name and Title’ field, give the name and official title of the person who oversees the analysis mentioned on the form. This can be different than the person listed in the ‘Contact Name’ field at the top of the form page. The ‘Lab Analyst or Operator’s Signature’ field needs to be physically signed by the person from the previous field. Do not write or type anything into the section that says “TCEQ Official Use Only”.

Footnotes are located on the next page to give clarification on a number of items featured on the form. The number found at the beginning of a footnote matches a corresponding superscripted number on the form.

Table 1 includes supplemental information for all analytes and corresponding fields found on the lab approval form: minimum calibration frequency, approved calibration methods, minimum accuracy, EPA Methods, ASTM Methods, SM Methods, and Other approved methods. The table matches the same analyte order found on the form and alternates background color to make it clear to which analyte the information belongs.