

Acquisition of PWS Operation and Treatment Data

Addendum 9

(Revision 2)

to the

Quality Assurance Project Plan for the Texas Commission on Environmental Quality Public Water System Supervision Program Relating to the Safe Drinking Water Act

Effective

November 10, 2022



Acronyms

CFR	Code of Federal Regulations
CA	corrective action
CL2MOR	chlorine dioxide monthly operating report
DLQOR	disinfectant level quarterly operating report
DQI	data quality indicator
DWAT	Drinking Water Assessment Team
DWQT	Drinking Water Quality Team
DWSFS	Drinking Water Special Functions Section
DWSS	Drinking Water Standards Section
E2	Electronic Environmental Reporting System
EPA	Environmental Protection Agency
GUI	groundwater under the direct influence of surface water
GWMOR	Groundwater Monthly Operating Report
GW	groundwater
GWR	Groundwater Rule
LT2	EPA Long Term 2 Enhanced Surface Water Treatment Rule
MRDL	maximum residual disinfection levels
NAP	nitrification action plan
NTU	nephelometric turbidity units
PWS	Public Water System
PWSS	Public Water System Supervision
QA	quality assurance
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
RAA	running annual average
RG	regulatory guidance
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SOP	standard operating procedure
SW	surface water
SWMOR	Surface Water Monthly Operating Report
SWTP	surface water treatment plant
SWTR	Surface Water Treatment Rule
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TOC	total organic carbon
TOCR	Total Organic Carbon Rule
TOP	Texas Optimization Program
TROT	Technical Review and Oversight Team
WSD	Water Supply Division

(A) Project Management

A1 Approval Pages

The following individuals are signatories to this QAPP Addendum because they are responsible for the direct oversight, implementation, and quality assurance (QA) of work described in this QAPP.

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Texas Commission on Environmental Quality (TCEQ) Office of Water (OW)/Water Supply Division (WSD)/ Drinking Water Standards Section (DWSS)/Drinking Water Quality Team (DWQT)

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A3 Distribution List

The PWSS Program Lead Quality Assurance Specialist (QAS) ensures the individuals on the distribution list in Section A3 of the Programmatic QAPP document receive a copy of the PWSS Program QAPP (Programmatic QAPP and Addenda). Redistribution occurs when amendments or revisions are approved and published.

The Team Leader(s) and/or Section Managers of teams described in Section A4 ensure the PWSS Program QAPP is distributed, or otherwise made available, to all participants specified in Section A4 of this QAPP Addendum.

The current, approved version of the Programmatic QAPP and Addenda are maintained on the [TCEQ PWSS Program](https://www.tceq.texas.gov/pwss.html)¹ webpage.

A4 Project/Task Organization

Section A4 of the Programmatic QAPP document describes roles and responsibilities of key TCEQ individuals in WSD management positions, including the PWSS Program Lead Quality Assurance Specialist, Deputy Director, Section Managers, etc. The roles and responsibilities of PWSs and other TCEQ personnel are addressed below.

A4.1 Public Water Systems (PWS)

PWS operators are responsible for collecting measurements and samples for treatment technique and disinfectant residual. PWS operators (or third-party operators, including laboratories) monitor and report PWS data/information to the TCEQ in accordance with TCEQ rules specified in Section A5 and comply with specific reporting requirements referenced in this QAPP Addendum.

PWS must comply with requirements regarding training, certification, measurement and sample collection, laboratory approval, sample analysis, etc. as described in this document.

A4.2 TCEQ Water Supply Division

A4.2.1 DWSS/Drinking Water Quality Team (DWQT)

Performs data review and management, and compliance determinations for Safe Drinking Water Act (SDWA) regulations related to disinfectant residuals, surface water treatment (except LT2, see below); total organic carbon; and chlorite and bromate. Compliance officers provide customer service to PWSs; maintain PWS guidance/instructions for monitoring and reporting; receive, review, and manage data/information from PWSs; and determine compliance.

¹ www.tceq.texas.gov/drinkingwater/pwss.html

The Laboratory Approval Coordinator provides guidance to the regulated community regarding the laboratory approval process; maintains the laboratory approval database; and edits, maintains, and publishes the forms and instructions PWSs use to apply for and maintain laboratory approval.

The team leader supervises activities related to this QAPP Addendum, maintains lines of communication with WSD management, and elevates problems and issues when identified.

A4.2.2 DWSS/Drinking Water Assessment Team (DWAT)

Performs data review and management, and compliance determinations for SDWA monitoring, reporting, and data management requirements for SDWA regulations related to the Groundwater Rule (GWR). The GWR compliance officer provides customer service to PWSs; maintains PWS guidance/instructions for monitoring and reporting; receives, reviews, and manages data/information from PWSs related to groundwater; and determines compliance.

The team leader supervises activities related to this QAPP Addendum, maintains lines of communication with WSD management, and elevates problems and issues when identified.

A4.2.3 PTRS/Technical Review and Oversight Team (TROT)

Performs data review and management for SDWA regulations related to the Long Term 2 Enhanced Surface Water Treatment Rule (LT2). Provides guidance to PWSs; sends LT2 sampling plan packets; reviews and approves templates for compliance with LT2; reviews monthly reports submitted by PWSs; enters monthly report results into the LT2 Access database; generates Bin letters; and assigns Bin classifications in SDWIS.

The team leader supervises activities related to this QAPP Addendum, maintains lines of communication with WSD management, and elevates problems and issues when identified.

A4.2.4 DWSF/Drinking Water Technical Review Team (DWTRT)

Supports data management functions related to this QAPP addenda and supervises the transfer of drinking water compliance data to the EPA.

The team leader supervises activities related to this QAPP Addendum, maintains lines of communication with WSD management, and elevates problems and issues when identified.

A5 Problem Definition/Background

In accordance with the SDWA PWSs monitor and report treatment technique and disinfectant residual data to the TCEQ PWSS Program. These data are reported from approximately 7,000 PWSs. Various teams within the TCEQ's WSD (see

Section A4) receive, review, and manage the data/information then use it to make compliance and enforcement decisions. The requirements for monitoring, analysis, reporting, data management, and compliance are specified in the following sections of Chapter 30 of the Texas Administrative Code (30 TAC).

- §290.110: Disinfectant Residuals
- §290.111: Surface Water Treatment
- §290.112: Total Organic Carbon
- §290.114: Other Disinfectant Byproducts (Chlorite and Bromate)
- §290.116: Groundwater Corrective Actions (CA) and Treatment Techniques

The treatment technique action levels (i.e., criteria) TCEQ follows to determine violations of standards, including monitoring and reporting violations, are specified in the applicable rule.

A6 Project/Task Description

PWSs monitor and report data/information related to the rules specified in Section A5 to ensure water is appropriately treated and complies with SDWA regulations. TCEQ maintains PWS [Regulatory Guidance \(RG\)](#)² documents related to these rules on its webpage and the applicable RG documents are summarized in Exhibit 1. RG documents help PWSs understand the federal and state rules and regulations and specify the requirements that apply to treatment plant operations and treatment, as well as monitoring, analysis, reporting, etc. TCEQ maintains program webpages (see Exhibit 1) specific to these rules which also specify PWS monitoring and reporting requirements, required forms, and related information.

A7 Quality Objectives & Criteria

Objectives and Project Decisions

The objective for the activities described in this QAPP is consistent with the overall objective of the SDWA to protect drinking water and public health. TCEQ uses the data/information generated under this QAPP Addendum to determine PWS compliance with rules specified in Section A5. Actions PWSs take when they are not in compliance to inform consumers and correct problems are not addressed within this QAPP.

The following activities/requirements described in this document pursuant to applicable rules ensure environmental data/information generated are of a known and defensible quality.

- TCEQ oversight and support
- training and certifications
- standardized reporting forms with automated data validation checks
- adherence to timelines

² www.tceq.texas.gov/downloads/publications/rg

- processes to manage data/information
- corrective action and response procedures

The TCEQ relies on data of this quality and implements requirements accordingly to ensure it makes valid, fair, and defensible compliance conclusions. The data quality indicators (DQIs) listed below relate to the level of quality needed to generate known and defensible data under this QAPP Addendum. The terms are described in the Programmatic QAPP document.

- sensitivity
- bias
- precision
- comparability
- completeness
- representativeness
- data integrity
- compliance

In order for the TCEQ to accurately evaluate and use the data reported for the purposes described above, they must be of known and defensible quality consistent with DQIs listed above. Measurement performance is addressed in Section B5 of this Addendum.

A8 Special Training Requirements/Certification

All personnel involved with the organization, planning, collection, reporting, management, and assessment of treatment technique and disinfectant residual data possess adequate experience and knowledge to perform satisfactorily all technical tasks assigned. TCEQ personnel performing work on this project are qualified/trained and possess general experience to perform their assigned work per Section A8 of the Programmatic QAPP. Specific training and certification requirements that apply to PWSs are addressed below.

A8.1 PWS Operator Requirements

A8.1.1 PWS Operator Certification

PWS personnel who monitor and report disinfectant residual and treatment technique data/information to the TCEQ under this QAPP addendum must be licensed by the TCEQ in accordance with rule-specific requirements. Section A8 of the Programmatic QAPP document describes the requirements for PWS operator licensing, including ongoing operator training.

The [TCEQ Occupational Licenses: Water System Operators](#)³ webpage lists the minimum requirements to get a license, register for the exam, maintain the license, and renew the license.

A8.1.2 PWS Operator Training

There are numerous conferences/training events throughout each year that provide PWS operators with applicable training. To maintain operator certification, public water system personnel must take continuing education courses as described on the website specified in the previous section. These training classes are offered by numerous sources and include topics pertinent to treatment and disinfection such as drinking water disinfection, media filtration for drinking water, membrane unit operations, system design and flow configurations for membrane operations, terms and equations for membrane operations, etc.

The TCEQ offers opportunities for PWS operators to receive training through conferences such as the [Environmental Trade Fair & Conference](#)⁴ and the annual [Public Drinking Water Conference](#)⁵ (PDW), both of which offer continuing education units (CEU) for TCEQ operators. In addition to opportunities for CEUs, PWS operators attending the PDW can receive technical assistance regarding the operation of their PWS, learn about additional resources available, current and upcoming drinking water requirements, and new technologies.

A8.2 Laboratory/Facility Requirements

A8.2.1 Approval and Accreditation

Laboratories and/or facilities that perform analyses under this QAPP addendum to determine compliance with the treatment technique requirements and maximum residual disinfectant levels (MRDLs) are approved or accredited by the TCEQ depending on rule-specific requirements.

Section A8 of the Programmatic QAPP document describes the TCEQ Programs for laboratory approval and laboratory accreditation, respectively. The rule-specific approval/accreditation requirements are summarized in Section B4 below.

A8.2.2 Certification of Cryptosporidium Laboratories

The EPA certifies Cryptosporidium laboratories for analysis under 30 TAC §290.111. The TCEQ provides PWSs with a link to EPA-certified laboratories at tceq.texas.gov/drinkingwater/trot/lt2schedule4.html.

³ www.tceq.texas.gov/licensing/licenses/waterlic

⁴ www.tceq.texas.gov/p2/events/etfc

⁵ www.tceq.texas.gov/drinkingwater/conference.html

A9 Documents and Records

A9.1 QA Project Plan Distribution

The distribution of the QAPP is described in Section A3 of this QAPP Addendum.

A9.2 PWS Documents and Records

PWSs maintain operation and treatment records in accordance with federal and state rules such as 40 CFR 141.33 and 30 TAC §290.46. The rules specify where records must be maintained and for how long. Compliance with records maintenance is reviewed by the TCEQ during comprehensive compliance investigations as described in Addendum 5 to this QAPP and Section C1 of this addendum.

Exhibit 1 summarizes documents (TCEQ forms, instructions, guidance, etc.) that PWSs use to monitor and report operation and treatment data in compliance with applicable TCEQ rules. TCEQ provides the documents and this information on TCEQ rule program webpages or via regulatory guidance documents.

Section B10 of this document lists the documents that WSD staff use to receive, review, and manage data/information, and determine compliance. The documents specified in Section B10 are all maintained on WSD network drives. WSD staff performing work under this QAPP Addendum maintain records as specified in Section A9 of the Programmatic QAPP document.

A9.3 Laboratory Documents and Records

Laboratory documents and records specific to accredited analyses described in this addendum include, but are not limited to the items listed below.

- Laboratory QA manuals and SOPs.
- Sample receipt documentation and records (including those listed in Section B3).
- Sample preparation and analysis bench sheets.
- Data review and verification records.
- Analytical test reports.

Accredited laboratories maintain documentation and records per the TNI Standard and other internal procedures. At a minimum, the laboratory maintains accessible records for a minimum of five years from generation of the last entry in the record and ensures adequate information is available to reconstruct the final results for compliance purposes. Changes in ownership, mergers, or closures of laboratories do not eliminate these requirements.

The laboratory will notify the PWS before disposing of records which are less than five years old so they may request copies, if needed. This includes all records pertaining to data produced and reported. If the laboratory changes its computer hardware or software, it must make provisions as required for the TNI standard, for ensuring prior data is retrievable.

(B) Data Generation and Acquisition

The TCEQ PWSS Program provides numerous forms, regulatory guidance (RG) documents, and instructions to assist PWSs and laboratories in documentation, generation, and reporting of data. These materials are used by the PWSs to produce work products such as monitoring plans, process control results, and disinfectant residual data.

B1 Sampling Process Design

All monitoring related to treatment techniques and disinfectant residuals is conducted at sites designated in each PWS's monitoring plan. PWSs must develop and maintain monitoring plans in accordance with 30 TAC §290.121: Monitoring Plans. The monitoring plans should describe the sampling processes conducted under this QAPP Addendum.

The WSD provides information on monitoring plan requirements on its [Public Water System Monitoring Plans](#)⁶ webpage. Information includes the Monitoring Plan Template, a TCEQ submittal address, and revision information. RG 384 – How to Develop a Monitoring Plan for a Public Water System also helps PWSs comply with rules to maintain a current monitoring plan.

Each PWS's monitoring plan includes applicable sampling design information such as sampling schedules, types of samples, number of samples, sampling locations, laboratory and test methods, etc. PWSs submit monitoring plans to the TCEQ, if required or requested, for review and approval in accordance with individual rule requirements. (Programmatic QAPP, Section B1.)

B2 Sampling Methods

Sampling conducted under this QAPP Addendum is performed using methods consistent with applicable rules specified in Section A5.

Sampling requirements specified by rule are included in RGs and on TCEQ webpages (see Exhibit 1). As a part of the monitoring plan, PWSs should prepare and follow SOPs that describe how to collect samples, measure operational and treatment parameters, and report required data in accordance with rule requirements and internal protocols.

B3 Sample Handling & Custody

Sample handling and custody conducted under this QAPP is performed using procedures consistent with applicable rules specified in Section A5.

Sample handling and custody requirements specified by rule are included in RGs and on TCEQ webpages as described in Exhibit 1. PWSs and laboratories should

⁶ www.tceq.texas.gov/drinkingwater/monitoring_plans

prepare and follow SOPs that describe how to handle samples in accordance with rule requirements and internal protocols.

Accredited laboratories maintain documentation for sample handling and custody procedures, including sample receipt, per the TNI Standard and other internal procedures.

B4 Analytical Methods

Monitoring and analyses required by 30 TAC §290.110, 30 TAC §290.111, 30 TAC §290.112, and 30 TAC §290.116 and specified in Section A5 are conducted at acceptable laboratories, as applicable (i.e., TCEQ-approved, TCEQ-accredited, or EPA-certified laboratories).

The acceptable analytical methods are specified in 30 TAC §290.119 (relating to Analytical Procedures) except for *Cryptosporidium* and *E. coli* analytical requirements specified in 30 TAC §290.111(b)(6). Analytical methods for *Cryptosporidium* conform to 40 Code of Federal Regulations (CFR) Part 141.704. The analytical methods for *E. coli* conform to 40 CFR Part 136(a).

The TCEQ provides information on analysis and reporting requirements on TCEQ webpages and in RGs (see Exhibit 1). PWSs and laboratories should prepare and follow SOPs to analyze samples in accordance with rule requirements, internal protocols, and the TNI Standard, where applicable.

See below for specific descriptions of analysis requirements.

B4.1 Disinfectant Residual Analyses

The monitoring required by 30 TAC §290.110 related to disinfectant residual data must be conducted by a facility/laboratory approved by the TCEQ. This includes free chlorine, chloramine, and chlorine dioxide residuals.

B4.2 Surface Water Treatment Analyses

The analysis of *Cryptosporidium* from raw surface water required by 30 TAC §290.111(b) must be conducted by a laboratory that is approved under the EPA Laboratory Quality Assurance Evaluation Program for Analysis of *Cryptosporidium* in Water (see section below, Certification of *Cryptosporidium* Laboratories).

The analysis of *E. coli* under this subsection must be conducted at a laboratory accredited by TCEQ.

Analysis of pH, temperature, residuals of free chlorine, chloramine, chlorine dioxide, and ozone required by 30 TAC §290.111(d) must be conducted by a facility/laboratory approved by TCEQ.

UV doses must be measured by a calibrated sensor approved by TCEQ.

Analysis of turbidity required by 30 TAC §290.111(e) must be conducted at a facility/laboratory approved by TCEQ.

B4.3 TOC Analyses

Analysis of TOC may include alkalinity, total organic carbon, dissolved organic carbon analyses, and specific ultraviolet absorbance as required by 30 TAC §290.112 and must be conducted at a facility/laboratory approved by TCEQ.

B4.4 Chlorite and Bromate Analyses

Analysis of chlorite entry point samples required by 30 TAC §290.114 must be analyzed at a facility/laboratory approved by TCEQ.

Chlorite distribution samples must be analyzed at a laboratory accredited by the TCEQ.

Bromate samples must also be analyzed at an accredited laboratory.

B4.5 Groundwater Corrective Actions and Treatment Technique Analyses

Analyses required by 30 TAC §290.116 must be conducted at an approved laboratory/ facility. This includes pH, temperature, and residuals of free chlorine, chloramine, chlorine dioxide, and ozone. Bacteriological analyses required by 30 TAC §290.116 must be analyzed at an accredited laboratory.

B5 Quality Control (QC)

PWSs and laboratories implement QC practices to ensure the data/information generated and reported under this QAPP Addendum conforms to the DQOs/DQIs specified in Section A7. The QC requirements specified by rule are included in RGS and on TCEQ webpages (see Exhibit 1) and in 30 TAC §290.46: Minimum Acceptable Operating Practices for Public Drinking Water Systems. PWSs and laboratories follow SOPs in accordance with both rule requirements and internal protocols to ensure QC requirements are met.

B6 Instrument/Equipment Testing, Inspection, and Maintenance

All instruments/equipment used to generate and report data under this QAPP Addendum are maintained to ensure they are appropriate for use. PWSs and laboratories follow SOPs in accordance with both rule requirements and internal protocols to ensure equipment maintenance requirements are implemented.

B7 Instrument Calibration and Frequency

All instruments and devices used to generate data/information under this QAPP Addendum have a calibration procedure which includes, but is not limited to responsibility, frequency, and method.

Field equipment needing periodic calibration and/or verification include, but are not limited to, disinfectant residual analyzers, thermometers, pressure measuring equipment, pH meters, and conductivity meters.

Laboratory equipment needing calibration and/or verification include, but are not limited to, analytical balances, thermometers, and instrumentation. The calibration requirements specified by rule are included in RGs and/or on TCEQ webpages summarized in Exhibit 1 and described in 30 TAC §290.46: Minimum Acceptable Operating Practices for Public Drinking Water Systems, specifically 30 TAC §290.46(s) Testing equipment. PWSs and laboratories prepare and follow internal SOPs to ensure calibrations requirements are implemented.

B8 Inspection/Acceptance Requirements of Supplies and Consumables

All supplies and consumables used to generate and report data under this QAPP Addendum are inspected and accepted when received to ensure they are appropriate for use. PWSs and laboratories follow internal SOPs to ensure requirements for supplies and consumables are implemented.

B9 Non-Direct Measurements

Non-direct measurements are not used for compliance determinations under this QAPP addendum.

B10 Data Management

The sections below describe the procedures used by PWSs and the WSD to report, receive, review, and manage the data/information related to the rules specified in Section A5. Data management processes are facilitated by electronic reporting forms and databases that have automated completeness and formatting checks built-in to ensure data/information submitted meets the requirements set forth in various rules and RGs.

The WSD stores data/information permanently in SDWIS. The WSD reports SDWIS compliance data/information to EPA quarterly as specified in Section C2 of the Programmatic QAPP. EPA reviews the reported data for errors and issues reports to TCEQ if data corrections are needed. Data corrections are made by WSD, as required.

B10.1 Disinfectant Residual Data Reporting

Disinfectant residual data that the PWSs provide on *DLQORs* are submitted to the TCEQ in two ways: (1) as a paper copy manually filled-in by the PWS operator and sent via mail, and (2) as electronic data submitted through the Electronic Environmental (E2) Reporting System. The DWQT Disinfectant Level Quarterly Report (DLQOR) Data Entry SOP describes the process for entering data from paper reports.

The DWQT uses Disinfectant Level Quarterly Operating Report (DLQOR) Monitoring and Reporting (M/R) SOP to migrate and review data, determine compliance, and generate notices of violation for monitoring and reporting violations.

The reporting requirements for results of tests, measurements, or analyses required by 30 TAC §290.110 are described below and summarized in Exhibit 1.

- PWSs exceeding the MRDL for chlorine dioxide must report the exceedance to the TCEQ within 24 hours of the event. (290.110(e)(1))
- PWSs that use surface water sources or groundwater sources under the direct influence of surface water report disinfectant level data on *the Combined Surface Water Monthly Operating Report* (Form 00105), each month.
- PWSs that use chlorine dioxide submit a *Chlorine Dioxide Monthly Operating Report* (Form 00690) each month.
- PWSs that use purchased water or groundwater sources only complete a *DLQOR* (Form 20067) each quarter.
- Community and nontransient, noncommunity public water systems submit the *DLQOR* (Form 20067) each quarter.
- Transient, non-community public water systems must retain the *DLQOR* (Form 20067) and must provide a copy if requested by the executive director.
- PWSs that use chloramines must retain their Nitrification Action Plans (NAP) and provide a copy upon request to the TCEQ.

B10.2 Surface Water Treatment Data

PWSs submit approximately 450 Surface Water Monthly Operating Reports (SWMOR) to the TCEQ per month. The DWQT receives, tracks and enters the data/information from SWMORs into the SWTR database. The DWQT audits data as described in the SOP *Surface Water Monthly Operating Report Data Entry*. This document outlines the process for auditing TCEQ data entry. Hard copy reports are reviewed against the electronic data to determine quality and accuracy of data entry. Once the audit is completed, data are corrected if needed.

Once the data from the SWMORs are received, entered into the SWTR database, tracked and reviewed, they are migrated from the SWTR database into SDWIS. Data are migrated into SDWIS weekly as referenced from the DWQT Standard Operating Procedure (SOP) *SWTR Data Migration*.

The TROT uses the TCEQ *LT2 Laboratory Report Review Checklist* work instruction to receive, review, and manage laboratory reports from PWSs. This includes verification of standard items such as laboratory accreditation or certification (as applicable), use of approved test methods, data review, addressing errors in reports, and communication with PWSs regarding needed actions.

The reporting requirements for results of tests, measurements, or analyses required by 30 TAC §290.111 are described below and summarized in Exhibit 1.

- Raw surface water sample results required by 30 TAC §290.111(b) must be reported to the TCEQ using the TCEQ LT2 Results Submittal Form at

<tceq.texas.gov/drinkingwater/trot/lt2schedule4.html>.

- PWSs that have turbidity levels exceeding 1.0 (nephelometric turbidity unit) NTU in the combined filter effluent must consult with the TCEQ within 24 hours.
- PWSs that treat SW submit the Combined *SWMOR* (00105) each month for each plant. GW sources under the direct influence of surface water submit a *SWMOR-alt* each month for each plant.
- PWSs that perform additional monitoring required by 30 TAC § 290.111(e)(4)(A)(i) or (B)(i) submit a *Filter Profile Report for Individual Filters* (Form 10276) with their *SWMOR*.
- PWSs that perform additional monitoring required by 30 TAC §290.111(e)(4)(A)(ii) or (B)(ii) submit a *Filter Assessment Report for Individual Filters* (Form 10277) with their *SWMOR*.
- PWSs that perform the additional monitoring required by 30 TAC §290.111(e)(4)(A)(iii) or (B)(iii) submit a *Comprehensive Performance Evaluation Request Form* (Form 10278) with their *SWMOR*.
- PWSs must submit any additional reports required by the TCEQ to verify the level of pathogen removal or inactivation achieved by the system's treatment plants.
- PWSs must submit their *Cryptosporidium* Bin classifications.
- PWSs must submit reports required by 30 TAC §290.111(b)(7).

B10.3 Chlorite and Bromate Data/Information

PWSs report chlorine dioxide and chlorite data/information on the CL2MOR. The DWQT uses the CLO2 Data Entry, CLO2 Chlorite QC and SDWIS Migration, and Chlorine Dioxide and Chlorite Compliance SOPs to receive, migrate, and review residual data/information from PWSs that use chlorine dioxide, determine compliance, and generate monitoring and reporting NOV's related to both chlorine dioxide and chlorite reporting.

PWSs that use ozone report disinfection residual data to the TCEQ on the DLQOR. They report bromate data to the TCEQ by submitting analytical test reports received from laboratories. The DWQT uses the Bromate Monthly Operating Report Data Entry and Bromate Compliance SOPs to receive, migrate, and review residual data/information from PWSs that use ozone, determine compliance, and generate monitoring and reporting NOV's related to both ozone and bromate reporting.

B10.4 TOC Data

The TOC Monitoring Operating Reports are entered and tracked in Access, TCEQ network drives, SDWIS, and Texas Drinking Water Watch by the TOC Compliance Coordinator. The Compliance Coordinator uses the TOCMOR Data Entry SOP to enter data from the reports into a Microsoft Access database. The Compliance Coordinator uses the TOC Compliance M/R SOP to determine the monthly TOC compliance status for applicable PWSs. Microsoft Access is used in conjunction with SDWIS to determine TOC compliance. Access is used to calculate the running annual averages (RAA). Access is also used to migrate samples, compliance results

and treatment technique violations for RAAs (below 1.00) into SDWIS. SDWIS stores all compliance data and generates monitoring and reporting violations.

The reporting requirements for results of tests, measurements, or analyses required by 30 TAC §290.112 are described below and summarized in Exhibit 1.

- PWSs treating surface water or groundwater under the direct influence of surface water must properly complete and submit surface water monthly operating reports to demonstrate compliance. See the previous section.
- PWSs that do not meet the Step 1 removal requirements must submit a Request for Alternate TOC Requirements at least 15 days before the end of the quarter.
- If a PWS meets alternative compliance criterion Number 3, the system must report the running annual average of total trihalomethane (TTHM) and haloacetic acid (HAA5) concentrations.
- If a PWS meets alternative compliance criterion Number 4, the system must report the running annual average TTHM and HAA5 concentrations and report all disinfectants used by the system during last the 12 months.
- If a PWS meets alternative compliance criterion Number 5, the system must report the average source water specific ultraviolet absorbance (SUVA) for each of the preceding 12 months.
- If a PWS meets alternative compliance criterion Number 6, the system must report the average treated water SUVA for each of the preceding 12 months.
- If a PWS practices softening and meets alternative compliance criterion Number 8, the system must report the source water and treated water magnesium concentrations and the average percent removal of magnesium obtained during each of the preceding 12 months.
- If a PWS does not meet any of the alternative compliance criteria, the system must apply for the Step 2 alternative removal requirements and must submit the results of Step 2 jar testing.

B10.5 Groundwater Corrective Actions and Treatment Technique Data

The TROT receives and reviews CT studies for 4-log treatment and generates approval/denial letters which the GWR Program and DWA Team Leader review. The reporting associated with the GWR is maintained onsite by PWSs that provide 4-log treatment in lieu of groundwater source monitoring or required to conduct 4-log treatment as a corrective action in response to a fecal indicator positive source sample.

PWSs must submit their monthly operating reports (MOR) to the WSD upon request in accordance with state and federal rule.

In some instances, PWSs that provide 4-log treatment are required to collect monthly raw samples from their wells. In the event an *E. coli*-positive raw well sample is collected for systems providing 4-log treatment, the WSD requests the MOR to ensure the system was maintaining 4-log treatment at the time of sample

collection. Information about required forms, guidance, and GWR information for PWS can be found on the TCEQ [Groundwater Rule](#)⁷ webpage.

The reporting requirements for results of tests, measurements, or analyses required by 30 TAC §290.116 are described below and summarized in Exhibit 1.

- A GW system required to conduct compliance monitoring for chemical disinfectants must complete a *Groundwater Monthly Operating Report (GWMOR)* (Form 20362) for GW disinfection facilities monthly. GW systems must maintain the reports on site and make them available to the TCEQ upon request.
- A GW system must provide written notification to the TCEQ that it is not required to meet the raw groundwater source monitoring requirements because it provides at least 4-log treatment of viruses for a specified groundwater source and must begin compliance monitoring. The notification must include engineering, operational, and other information required by the TCEQ to evaluate the submission.
- A GW system is required to complete corrective action or be in compliance with an approved corrective action plan within 120 days and must notify the TCEQ within 30 days of completing the corrective action.
- If a GW system is subject to the triggered source monitoring requirements and does not conduct source monitoring, the system must provide written documentation that it was providing 4-log treatment of viruses for the specified groundwater source or that it met the criteria within 30 days of the positive distribution coliform sample.
- A GW system conducting compliance monitoring must notify the TCEQ any time the system fails to meet any TCEQ-specified requirements (including, but not limited to, minimum residual disinfectant concentration and alternative treatment operating criteria) if operation in accordance with the criteria or requirements is not restored within four hours. The system must notify the TCEQ as soon as possible, but no later than the end of the next business day.

(C) Assessment and Oversight

C1 Assessments and Response Actions

C1.1 Corrective Actions (CA)

All project participants (i.e., TCEQ, laboratories, etc.) involved with work described in this addendum are responsible for identifying deficiencies when there are nonconformances with established procedures involving the performance of their work. Deficiencies may be identified during the performance of routine work, or during audits and oversight.

Most nonconformances are not “deficiencies” as addressed in this section. Staff routinely encounter, document, and correct technical and procedural nonconformances at the point of origin using established procedures defined in

⁷ www.tceq.texas.gov/drinkingwater/gwr_main.html

SOPs that include documentation of problem, solution, implementation and follow-up. These nonconformances are documented at the point of origin and maintained with the applicable project records. However, the level of corrective action described in this section may be warranted when established procedures don't prevent a situation from recurring.

C1.1.1 Deficiencies Requiring a Corrective Action Plan (CAP)

Deficiencies are unique nonconformances that cannot be corrected by established procedures and will require actions to be defined and documented in a corrective action plan (CAP) within 14 days. Upon detection of a deficiency, staff are responsible for notifying their management in writing.

For this project, deficiencies may involve, but are not limited to the following situations.

- Results or conclusions are jeopardized
- Nonconformances with state or federal regulations
- Intentional misrepresentation of data or information
- Repeat nonconformances or deviations from standard practices

The preparation of CAPs is assigned to appropriate staff by managers who are responsible for assuring that CAPS are:

- Appropriately prepared, reported, implemented, and verified effective.
- Implemented in ways that will most likely eliminate the problem and prevent recurrence.
- Forwarded to PWSQA@tceq.texas.gov within 14 days of initial notification.

The PWSS Program Lead Quality Assurance Specialist, or designee, receives and reviews CAPs to determine if actions planned to resolve the deficiency are acceptable, provides feedback on any items determined to be insufficient, tracks reported CAPs, and may monitor implementation. Appropriate staff may be designated to review and track corrective actions that are not deemed significant, as described in C1.1.3.

C1.1.2 Required Content for a CAP

The procedure for preparing a CAP following the identification of a deficiency begins with an investigation to determine the root cause(s). Procedures for CAPs are specified in laboratory, contractor, or PWSS Program SOPs. Management selects and implements CAPs that will mostly like eliminate the problem, prevent recurrence, and are appropriate for the magnitude and degree of risk of the deficiency.

CAPs must include the following information:

- Description of the deficiency

- What happened, how was it identified, and the date identified?
- Root cause
 - What was the underlying cause? Why did the deficiency occur?
- Programmatic or data impact(s)
 - How did the deficiency affect data or program decisions and what was reviewed (including timeframe) to determine the impact?
- Corrective action taken
 - What was done to correct the deficiency?
- Timeline for corrective action(s)
- Documentation
 - How will the corrective action(s) be documented?
- Actions to prevent recurrence
 - What actions will be taken to prevent the deficiency from occurring again? These must be distinctly different from the corrective actions.
- Timeline for action(s) to prevent recurrence
- Documentation
 - How will the preventative action(s) be documented?
- Verification of effectiveness
 - Who will verify effectiveness, when will verification occur, and how will verification be documented?

The TCEQ QA Program has developed a standardized template form that may be used, TCEQ QAF-005. This template can be accessed through the [TCEQ Quality Assurance](#)⁸ webpage under the Corrective Action Process section. The form is also available by request at PWSQA@tceq.texas.gov.

C1.1.3 Significant Deviations

Actions associated with significant deviations are described within the Programmatic QAPP, Section C1.1.3.

C1.2 Authorization to Stop Work

TCEQ management will authorize work stoppage if conditions are identified that indicate compliance is in jeopardy or if primacy requirements are not being met. The PWSS Program Lead Quality Assurance Specialist, Grant Manager, or TCEQ QA Manager may also request a work stoppage.

⁸ www.tceq.texas.gov/agency/qa

C2 Reports to Management

TCEQ program staff keep WSD management and the EPA informed of project oversight and assessment activities and findings as described in Section C2 of the Programmatic QAPP.

(D) Data Review and Usability

D1 Data Review, Verification, and Validation

This section defines the review processes to ensure data/information are of known and defensible quality consistent with program objectives specified in Section A7. The review of data/information generated and reported under this QAPP Addendum involves verification and validation as defined in the following two paragraphs.

Verification: Evaluating the completeness, correctness, and conformance/compliance of specific data/information against method and procedural requirements described in this QAPP Addendum. PWSs and their agents are responsible for verifying data collected and reported under this Addendum prior to reporting.

Validation: A sample and analyte-specific process that extends the evaluation of data/information beyond method and procedural compliance (i.e., data verification) to determine the quality of specific data sets. The validation of data is the responsibility of the TCEQ.

D2 Verification and Validation Methods

PWSs and/or their agents review and verify the operational and treatment data/information before reporting in accordance with internal SOPs.

Once received, WSD staff (see Section A4) is responsible for validating that the data/information reported are of known and defensible quality and support their intended use. WSD reviews and validates them in accordance with SOPs listed in Section B10 of this document. In addition to the software validation functions, program staff review and validate hardcopy reports against electronic data/information, as applicable and described in SOPs. When unacceptable data are observed, TCEQ staff coordinate with the applicable entity to have corrected data resubmitted before migrating data into SDWIS for use in compliance.

D3 Reconciliation with User Requirements

The data and information collected, managed, and reported under this QAPP conform to 30 TAC §290. These statutes and requirements define PWSS Program objectives and DQIs specified in Section A7. Conformance to this QAPP helps ensure users (i.e., PWSs, consumers, the TCEQ, and the EPA) can use the data and information as generated and have confidence in the results. Data and information not meeting quality objectives is not used by the PWSS Program for SDWA determinations or reported to the EPA.

Exhibit 1

Reporting Requirements

Reporting Requirement	Applicability	30 TAC Reporting Reference	Reporting Frequency	TCEQ Form	TCEQ Program Webpages	RG ⁹ or other Guidance Document(s)
Chlorine dioxide MRDL exceedances	PWSs that use chlorine dioxide	§290.110(e)	Within 24 hours of the event DBP@tceq.texas.gov		<tceq.texas.gov/drinkingwater/chemicals/dbp/dbp_risk.html	RG 503 Monitoring, Analyzing, and Reporting Chlorine Dioxide and Chlorite <tceq.texas.gov/assets/public/permitting/watersupply/pdw/CLO2_Instructions_Form00690.pdf>
DLQOR Disinfectant residual data/information	PWSs that use purchased or GW sources only	§290.110(e)	Quarterly	DLQOR Form 20067	<tceq.texas.gov/drinkingwater/disinfection/dl_qor>	RG 407 Monitoring, Analyzing, and Reporting of Free Chlorine and Chloramines
SWMOR Disinfectant residual data/information	PWSs that use SW or GUI	§290.110(e)	Monthly	SWMOR Forms (TCEQ-00105)	<tceq.texas.gov/drinkingwater/swmor/swmor/swmor-forms-and-instructions#form>	RG-211 Surface Water Treatment Plant Requirements for Monthly Reporting and Public Notification
Cl2MOR Disinfectant residual data/information	PWSs that use chlorine dioxide	§290.110(e)	Monthly	CL2MOR Form 00690	<tceq.texas.gov/drinkingwater/swmor/swmor/swmor-forms-and-instructions#form>	RG 503 Monitoring, Analyzing, and Reporting Chlorine Dioxide and Chlorite
NAP Chloramine effectiveness monitoring	PWSs that use chloramines	§290.110(e)	Upon request	Nitrification Action Plan (NAP) template	<tceq.texas.gov/drinkingwater/disinfection/nitrification.html>	<tceq.texas.gov/downloads/drinking-water/disinfectant-report/nap-summary.pdf
LT2 Rule raw surface water monitoring data/information for <i>Cryptosporidium</i> , <i>E. coli</i> , and turbidity	PWSs that use SW or GUI	§290.111(b)	Within 10 days of receipt by the PWS and no later than 10 days after the end of the first month following the month that the sample was collected	NA	<tceq.texas.gov/drinkingwater/trot/lt2schedule4.html>	EPA LT2 Sampling Pocket Guide: <nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=2000ZZBU.txt>

⁹ www.tceq.texas.gov/downloads/publications/rg

Reporting Requirement	Applicability	30 TAC Reporting Reference	Reporting Frequency	TCEQ Form	TCEQ Program Webpages	RG⁹ or other Guidance Document(s)
Turbidity levels exceeding 1 NTU in the combined filter effluent	PWSs that use SW or GUI	§290.111(h)(1)	Within 24 Hours of the event SWTR@tceq.texas.gov	Violation Report Form 10449	<tceq.texas.gov/drinkingwater/swmor/swmor/violation-report-form2>	RG-211 Surface Water Treatment Plant Requirements for Monthly Reporting and Public Notification <tceq.texas.gov/downloads/drinking-water/operating-reports/form-10449-instructions.pdf>
Individual and combined filter performance	PWS that continuously monitor filter performance	§290.111(h)(2)(A), (B), and (C); §290.111(h)(3)	Monthly; or As Needed	SWMOR Form 10276	<tceq.texas.gov/drinkingwater/swmor/swmor/fpr>	RG-211 Surface Water Treatment Plant Requirements for Monthly Reporting and Public Notification <tceq.texas.gov/drinkingwater/swmor/swmor/forms-and-instructions>
Filter assessment report	PWSs that must complete the additional monitoring required by subsection (e)(4)(A)(ii) or (B)(ii)	§290.111(h)(4)	As Needed	Filter Assessment Report for Individual Filters Form 10277	<tceq.texas.gov/drinkingwater/swmor/swmor/fpr> <tceq.texas.gov/drinkingwater/swmor/swmor/swmor-forms-and-instructions>	RG-211 Surface Water Treatment Plant Requirements for Monthly Reporting and Public Notification
Request for a comprehensive performance evaluation	PWSs that must complete the additional monitoring required by subsection (e)(4)(A)(iii) or (B)(iii)	§290.111(h)(5)	As Needed	Comprehensive Evaluation Request Form 10278	<tceq.texas.gov/drinkingwater/swmor/swmor/fpr>	RG-211 Surface Water Treatment Plant Requirements for Monthly Reporting and Public Notification <tceq.texas.gov/drinkingwater/swmor/swmor/swmor-forms-and-instructions>

Reporting Requirement	Applicability	30 TAC Reporting Reference	Reporting Frequency	TCEQ Form	TCEQ Program Webpages	RG ⁹ or other Guidance Document(s)
Pathogen removal or inactivation	PWSs must submit additional reports required by the TCEQ to verify the level of pathogen removal or inactivation achieved by the system's treatment plants.	§290.111(h)(6)	As Needed	Meeting Treatment Technique Requirements for Cryptosporidium, Giardia and Viruses	<tceq.texas.gov/downloads/drinking-water/plan-technical-review/guidance/>	<tceq.texas.gov/assets/public/permitting/watersupply/pdw/SG-TROT-Meeting_Minimum_Treatment_Requirements.pdf>
TOC treatment technique data/information	PWS that use SW or GUI	§290.112(e)	Monthly	SWMOR Form	<tceq.texas.gov/drinkingwater/swmor/swmor/index_guidance.html>	RG 379 Total Organic Carbon Guide
Chlorine dioxide operating data/information	PWS that use chlorine dioxide	§290.114(a)	Monthly	CL2 MOR	<tceq.texas.gov/drinkingwater/chemicals/dbp/dbp_risk.html>	RG 503 Monitoring, Analyzing, and Reporting Chlorine Dioxide and Chlorite
Chlorite analytical reports	PWSs that use chlorine dioxide	§290.114(a)	Monthly Email analytical report to dbp@tceq.texas.gov	NA	<tceq.texas.gov/drinkingwater/chemicals/dbp/dbp_risk.html>	RG 503 Monitoring, Analyzing, and Reporting Chlorine Dioxide and Chlorite
Bromate analytical reports	PWSs that use ozone	§290.114(b)	Monthly Email analytical report to dbp@tceq.texas.gov	NA	<tceq.texas.gov/drinkingwater/chemicals/dbp/dbp_risk.html>	RG 544 - Monitoring, Analyzing, and Reporting Bromate for Public Water Systems Using Ozone

Reporting Requirement	Applicability	30 TAC Reporting Reference	Reporting Frequency	TCEQ Form	TCEQ Program Webpages	RG ⁹ or other Guidance Document(s)
GW chemical disinfectant compliance monitoring	PWSs that use GW and are required to conduct compliance monitoring for chemical disinfectants facilities	§290.116(d)(1)	As applicable. See note below table.	GWMOR, Form 20362	<tceq.texas.gov/drinkingwater/gwr_main.html>	RG-421: Coliform Monitoring, Analyzing, and Reporting
Written notification that a GW PWS is not required to meet raw groundwater source monitoring requirements under §290.109(d)(4)	PWSs that use GW and provide 4-log viral inactivation	§290.116(d)(2)	As Needed	Email notification to GWRDATA@tceq.texas.gov or PTRS@tceq.texas.gov	<tceq.texas.gov/drinkingwater/gwr_main.html> or <tceq.texas.gov/drinkingwater/swmor/swmor/ct_info>	NA
GWR Corrective actions	When a GW system has a significant deficiency or a fecal indicator-positive groundwater source sample	§290.116(d)(3)	Within 30 days of completing the corrective action	Email corrective action to GWRDATA@tceq.texas.gov	<tceq.texas.gov/drinkingwater/gwr_main.html> or	RG-421: Coliform Monitoring, Analyzing, and Reporting
Written documentation that it was providing 4-log treatment of viruses	PWSs that use GW subject to the triggered source monitoring requirements of §290.109(d)(4)(A) and do not conduct source monitoring	§290.116(d)(4)	Within 30 days of the positive distribution coliform sample	GWMOR, Form 20362	<tceq.texas.gov/drinkingwater/gwr_main.html> or	NA

Reporting Requirement	Applicability	30 TAC Reporting Reference	Reporting Frequency	TCEQ Form	TCEQ Program Webpages	RG ⁹ or other Guidance Document(s)
Concentration time	GW systems conducting compliance monitoring if operations are not restored four hours	§290.116(d)(5)	Within 4 hours	GW CT Study Template, GW 4-Log MOR	tceq.texas.gov/drinkingwater/gwr_main.html or tceq.texas.gov/drinkingwater/swmor/swmor/ct_info	RG-421: Coliform Monitoring, Analyzing, and Reporting

Note: In some instances, PWSs that provide 4-log treatment are required to collect monthly raw samples from their wells. In the event an *E. coli*-positive raw well sample is collected for systems providing 4-log treatment, the WSD requests the MOR to ensure the system was maintaining 4-log treatment at the time of sample collection.