Quality Assurance Project Plan for Drinking Water Samples

QTRAK# 21-173

2021-2024

New Mexico Environment Department

Drinking Water Bureau

Expires: March 2, 2024

APPROVAL PAGE

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VERSION HISTORY PAGE

Version	Date	Revisions & Comments
0.0	December 2021	EPA Approval - 2/2/2022
1.0	December 2022	This version of the QAPP incorporates essential revisions, updates, and formatting to the document in its entirety. The integrity of the original content regarding technical and quality objectives of the project have been preserved and have not significantly changed. The following list reflects updates performed for the following sections: ▪ Addition and insertion of a "Version History Page". ▪ Table of Contents: Additional sections inserted to incorporate Tables and Figures. ▪ Part 1 - Section 1.0: Addition of section tile,“Purpose” and insertion of added paragraphs 1 and 3. ▪ Section 1.1: New section title "QAPP Location & Updates" and additional language inserted. Minor edits performed within the section. ▪ Section 1.2 - QAPP Distribution List: NMED DWB email addresses have been updated to reflect new email address format for State of NM. New key staff and contact information were added to the list in Table-1. ▪ Section 1.3 - QAPP Management & Authority Structure Chart: The Chart format and design have been updated. Addition of new NMED Division Financial Manager is reflected within the chart. ▪ Section 1.4 - Project/Task Organization: Paragraphs1 and 2 - content and language updated. ▪ Section 1.5 - Drinking Water Bureau: Paragraphs 1, 2, 3 & 4 revisions performed and additional language inserted. Figure 2, Drinking Water Bureau – Task Organization Chart has been added to this section. ▪ Section 1.8, Subsection 1.8.1 - Background: Minor edits, revisions and additional language incorporated within paragraphs 1, 2, 3, & 4. ▪ References: References section has been updated and new references added. ▪ Appendix A: Drinking Water Bureau Organization Chart: Chart reflects current Drinking Water Bureau Personnel as of 12/22/2022. ▪ Appendix C: Formatting and addition of Appendices C.1 - EPA and C.2 - NMED.

ABBREVIATION TERMS

ABBREVIATIONS	DEFINITIONS
µg	Microgram
˚C	Degrees Celsius
CFR	Code of Federal Regulations
COC	Chain of Custody
DBP	Disinfection By-Products
DQO	Data Quality Objectives
DWB	Drinking Water Bureau
DWLCP	Drinking Water Laboratory Certification Program
E. coli	Escherichia coli
EPA	Environmental Protection Agency
˚F	Degrees Fahrenheit
GWUDI	Ground Water Under the Direct Influence
H_2SO_4	Sulfuric Acid
HAA5	Haloacetic Acids
HCl	Hydrochloric Acid
HNO_3	Nitric Acid
IOC	Inorganic Compound
L	Liter
LIMS	Laboratory Information Management System
MCL	Maximum Contaminant Level
Mg	Milligram
mL	Milliliter
MRDL	Maximum Residual Disinfectant Level
$Na_2S_2O_3$	Sodium Thiosulphate
NaOH	Sodium Hydroxide
NH_4Cl	Ammonium Chloride
NM	New Mexico
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes Annotated

NTU	Nephelometric Turbidity Unit
OIT	Office of Information Technology
pCi/L	Picocuries per Liter
PAG	Program Administration Group
PWS	Public Water System
PWSS	Public Water System Supervision
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QMP	Quality Management Plan
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SOC	Synthetic Organic Compound
SWIG	Sustainable Water Infrastructure Group
TDS	Total Dissolved Solids
TT	Treatment Technique
TTHM	Total Trihalomethanes
UOCP	Utility Operator Certification Program
VOC	Volatile Organic Compound
WCF	Water Conservation Fund

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TABLES

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PART 1: QA PROJECT PLAN MANAGEMENT ELEMENTS

1.0 PURPOSE

The purpose of this Quality Assurance Program Plan ("QAPP") is to document Quality Assurance and Quality control for sampling and technical activities to ensure that results of the New Mexico Environment Department ("NMED") Drinking Water Bureau ("DWB") operations meet the criteria required by the United States Environmental Protection Agency ("EPA") and the State of New Mexico ("NM"). The implementation of the QAPP are part of EPAs' mandatory Quality System and requirements for Quality Assurance.

This document was prepared in accordance with *EPA Requirements for QA Project Plans (QA/R-5)* (EPA, 2001a) and *EPA Guidance for Quality Assurance Project Plans (QA/G-5).* The QAPP for will be kept on-file at NMED DWB. This document is reviewed annually and will be updated as needed. A copy of this QAPP will be sent to the distribution list electronically after each update is complete.

This document shall be valid for a period of up to three (3) years from the official date of publication. After three (3) years, it shall be submitted to EPA for review and reissue.

1.1 QA PROJECT PLAN LOCATION AND UPDATES

The QAPP for will be kept on-file at NMED DWB. This document is reviewed annually and will be updated as needed. A copy of this QAPP will be sent to the distribution list electronically after each update is complete.

The Quality Assurance Officer is the liaison for this QAPP and responsible providing the QAPP to the EPA Region 6 Project Officer, the Bureau Chief of the DWB, ensuring the appropriate related program personnel have the most current approved version of the QAPP.

The QAPP is available for public access on the NMED DWB webpage at this link:
https://cloud.env.nm.gov/water/?r=7962&k=cfedbff0bb

1.2 QA PROJECT PLAN KEY PERSONNEL & DISTRIBUTION LIST

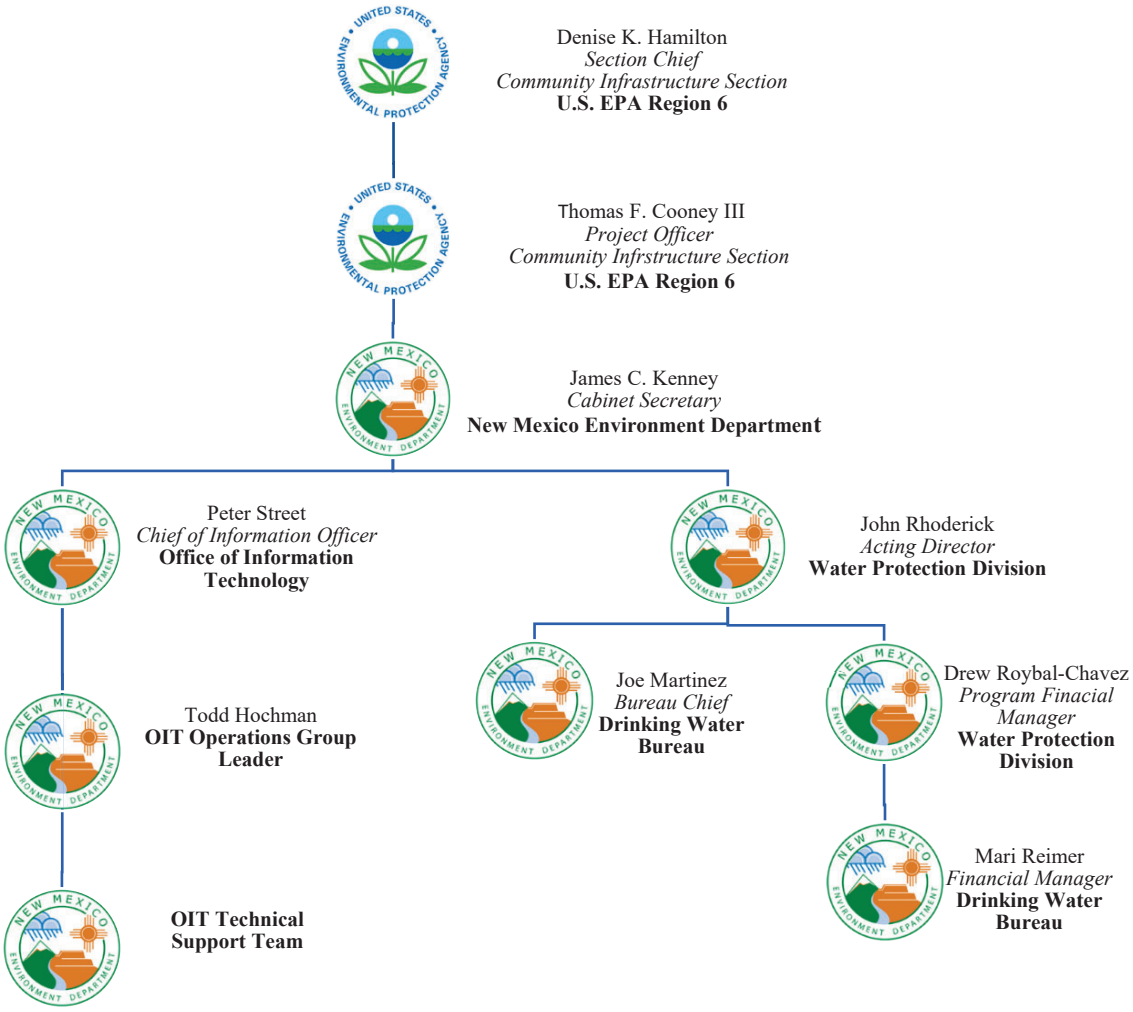
A list of key positions and their roles regarding this QAPP is provided in below Table 1-1. Verification that DWB Water Conservation Fund ("WCF") Monitoring (a.k.a. Sampling Team) staff have access to and will comply with the requirements of the QAPP will be documented by acknowledgment statements and maintained in DWB QA files.

Table 1. QA Project Plan Key Personnel

Project Personnel	Project Title	Organization	Email	Phone No.
Denise Hamilton	Section Chief	U.S EPA R6	Hamilton.Denise@epa.gov	(214) 665-2775
Thomas F. Cooney III	Project Officer	U.S EPA R6	Cooney.Thomas@epa.gov	(214) 665-6580
Joe Martinez	Bureau Chief	NMED-DWB	joe.martinez@.env.nm.gov	(505) 467-9415
Bethany Anderson	WCF Manager	NMED-DWB	bethany.anderson@.env.nm.gov	(505) 469-3204
Christina Pilar	QA Officer	NMED-DWB	christina.pilar2@env.nm.gov	(505) 469-7658
Victoria Delgado	Certified Sampler	NMED-DWB	victoria.delgado@.env.nm.gov	(505) 670-6866
Vernon Trujillo	Certified Sampler	NMED-DWB	vernon.trujillo@.env.nm.gov	(505) 372-8170
Angel Flores	Certified Sampler	NMED-DWB	angel.flores@.env.nm.gov	(505) 660-0453
Valerie Horner	Certified Sampler	NMED-DWB	valerie.horner@.env.nm.gov	(505) 372-8167
Scott Hulder	Certified Sampler	NMED-DWB	scott.hulder@env.nm.gov	(505) 372-8173
Rocio Galvan	Certified Sampler	NMED-DWB	rocio.galvan@.env.nm.gov	(505) 819-7687
Tanya Trujillo	PWSS Manager	NMED-DWB	tanya.trujillo2@.env.nm.gov	(505) 372-8273
Wayne Jeffs	N. Compliance SPVSR	NMED-DWB	wayne.jeffs@.env.nm.gov	(505) 469-7457
Brandi Littleton	S. Compliance SPVSR	NMED-DWB	brandi.littleton@.env.nm.gov	(575) 323-4298
James Midkiff	Data Steward SPVSR	NMED-DWB	james.midkiff1@env.nm.gov	(505) 660-3391
Daniel Ramirez	Data Steward	NMED-DWB	daniel.ramirez1@.env.nm.gov	(505) 222-9533
Adele McKenzie	Data Steward	NMED-DWB	adele.mckenzie@.env.nm.gov	(505) 476-8647
Michelle Olson	Data Steward	NMED-DWB	michelle.olson1@.env.nm.gov	(505) 901-7342
Jill Turner	SWIG Manager	NMED-DWB	jill.turner@env.nm.gov	(505) 205-6964
Eric Hall	UOCP Manager	NMED-DWB	eric.hall@.env.nm.gov	(505) 670-7418
Other stakeholders	*The approved QAPP will be made available to other stakeholders, including PWS, contract laboratories or DWB employees via DWB webpage or upon request.*			

1.3 QA PROJECT PLAN MANAGEMENT & AUTHORITY STRUCTURE

Figure 1. QAPP General of Management Structure and Approval Authority



The organizations and responsibilities are discussed within the next section and the Bureau's Organization Chart for related key personnel in relation to this QAPP are provided in **Appendix A**. Further detailed descriptions and additional information for NMED Drinking Water Programs administered by the DWB can be reviewed in DWB's Quality Management Plan ("QMP") can be found at this link: https://cloud.env.nm.gov/water/?r=7960&k=66379ca8fc

1.4 QA PROJECT PLAN & TASK ORGANIZATION

This QAPP applies to all personnel within the NMED DWB who sample drinking water and those who are responsible for the collection and management of the data produced by the sampling protocol. All water sampling activities covered by this QAPP are performed by NMED DWB Water Conservation Fund ("WCF") Monitoring Program (DWB Sampling Team), and Public Water System ("PWS") samplers who are certified through the DWB Utility Operator Certification Program ("UOCP") and shall comply with the program's regulatory, technical, and quality objectives within this QAPP.

Analytical services are provided by contracted laboratories certified by the DWB. The DWB Organization Chart is provided in Appendix A. All water sampling activities covered by this QAPP are performed by NMED DWB or PWS samplers who are certified through the DWB UCOP. Analytical services are provided by contracted laboratories that are certified by the DWB.

1.5 DRINKING WATER BUREAU

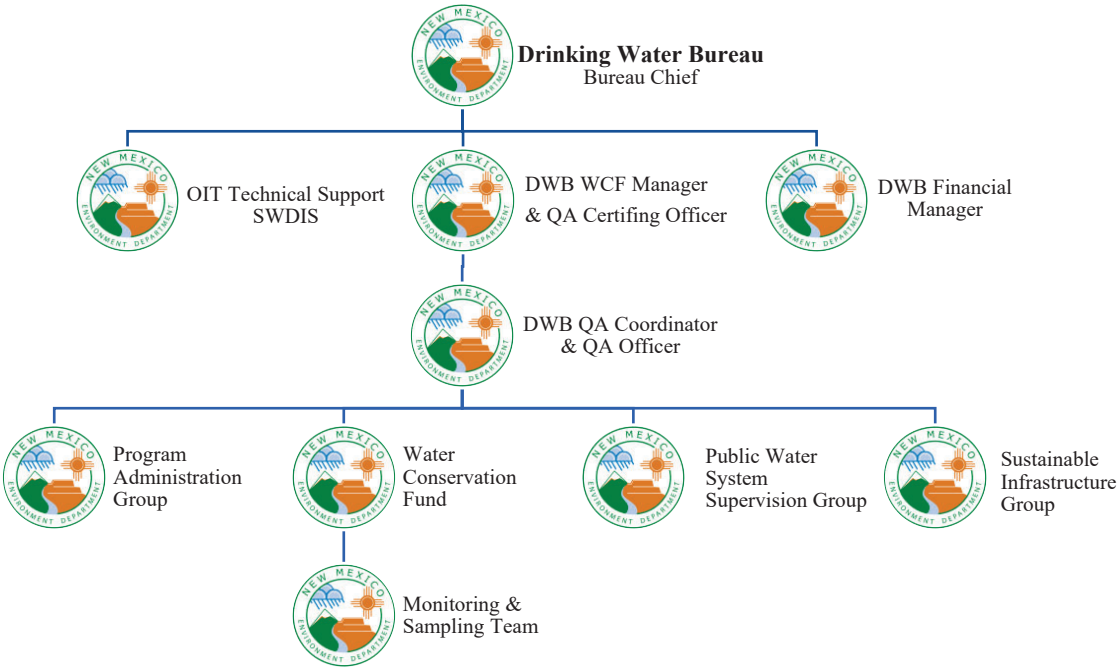
The DWB is organized into four Groups: Program Administration Group ("PAG"), Water Conservation Fund Group (WCF), Public Water System Supervision Group ("PWSS"), and Sustainable Water Infrastructure Group ("SWIG"). **See Figure 2.**

The DWB Bureau Chief appoints an appropriate DWB staff member to be the Quality Assurance ("QA") Officer who is a liaison for this QAPP. The QA Officer and the WCF Manager are responsible for ensuring this QAPP is updated. The QA Officer reports to the Bureau Chief so that independence from environmental data generation is maintained.

The Group Managers, PWSS Compliance Supervisors, Data Team Supervisor, and Quality Assurance Officer are responsible for verifying that all applicable activities of these sections comply with the provisions of this QAPP. All DWB personnel who collect or manage environmental data are responsible for the implementation of methods and procedures described in this QAPP and must be familiar with and follow the provisions of this QAPP.

The Monitoring, or Sampling Team, is administered under the WCF Group, as it is the Water Conservation Fee that provides the funding for compliance monitoring of the public water systems. The WCF Group has the primary responsibility for collecting drinking water samples for compliance and tracking monitoring schedules; however, various employees within the DWB are certified to collect drinking water samples, if necessary, and must adhere to the requirements of this QAPP.

Figure 2. Drinking Water Bureau – Task Organization Chart



Additionally, the Office of Information Technology (OIT) Bureau of the NMED assigns technical staff to each Bureau to maintain computer hardware, software, and networks, which includes maintaining the Safe Drinking Water Information System (SDWIS), the ultimate repository of all environmental data collected by the DWB. The activities performed by each section are summarized in **Table 2.**

Table 2. Summary of DWB Responsibilities	
Organizational Unit	**Responsibilities**
Bureau Chief	Oversees the Bureau, including the QA Program.
Quality Assurance	Administers the lab certification program, writes, and reviews SOPs, QAPPs and the Quality Management Plan, and performs internal audits.
Program Administration Group	Provides administrative support services to all DWB programs.
Water Conservation Fund Group	Coordinates water sampling to determine compliance with the Safe Drinking Water Act and helps ensure the quality of the resulting data; oversees laboratory certification program and manages laboratory contracts.
Public Water System Supervision Group	Provides oversight to PWS to ensure compliance with the drinking water regulations, protect the public from waterborne diseases, and ensure safe drinking water for all public water systems; manages and maintains SDWIS including overseeing the verification and validation of data; and implements the drinking water enforcement program.
Sustainable Water Infrastructure Group	Implements Capacity Development, Community Services, Technical Assistance, Source Water Protection Programs, and Utility Operator Certification Program.
Financial/Administrative Section	Oversees the financial functions of the Bureau, including central and field offices; evaluates financial program effectiveness; develops, modifies, and implements operating procedures, fiscal policies, and accounting procedures for funding programs within the DWB. Note: This section is not responsible for collecting environmental data and is organized under NMED's Administrative Services Division.
Office of Information Technology Support	Maintains computer hardware, software and networks and maintains the Safe Drinking Water Information System for the DWB. Note: This section is not responsible for collecting environmental data and is organized under NMED's Office of Information Technology Division.

1.6 PUBLIC WATER SYSTEMS

Samples for chemical contaminants are generally collected by the DWB WCF sampling team; however, the collection of samples for microbiological contaminants and all chemical samples required in distribution or process control is the responsibility of each PWS. The UOCP requires regular training for drinking water sampling certification to ensure quality data is obtained through the sample collection.

Each PWS must employ a certified water system operator, also certified through the UOCP. This certification includes water sampling certification. Each PWS reports and provides data to the appropriate Compliance Officer/Data Steward via electronic upload of analytical results into SDWIS and data delivery from certified laboratories.

1.7 CONTRACT LABORATORIES

Drinking water samples collected for compliance by the DWB and PWS staff are analyzed by the NM Department of Health Scientific Laboratory Division (SLD) and other DWB contract laboratories. Each analytical laboratory must be certified by the NMED Drinking Water Laboratory Certification Program (DWLCP) and conform to the specifications and requirements of this QAPP. Each contract laboratory will have access to a copy of this QAPP via DWB's website, or upon request, and will report and provide data to the appropriate Compliance Officer/Data Steward.

A list of the labs currently certified by the DWLCP can be found at the following link: https://service.web.env.nm.gov/urls/xzSRImOI.

1.8 QA PROJECT PLAN BACKGROUND & PROBLEM DEFINITION

1.8.1 Background

The "Safe Drinking Water Act of 1974" ("SWDA") was established to protect the nation's quality of drinking water and all sources that supply water for drinking use. The SWDA 1996 amendments require that EPA consider a detailed risk and cost assessment and best available peer-reviewed science when developing these standards, and that State governments, which can be approved to implement these rules for EPA also encourage attainment of secondary standards. Under the SDWA, EPA establishes minimum standards for state programs to protect above and underground sources of drinking water from endangerment. (EPA, 2022, para 1).

The NMED DWB has been granted SDWA primacy and has the authority to implement and enforce the primary SDWA regulations. In addition to the federal regulations, DWB enforces New Mexico Rules and Regulations governed by the "Environmental Improvement Act", New Mexico Statutes Annotated ("NMSA

1978") §74-1-1 through §74-1-17, and by Title 20 "Environmental Protection" Chapter 7 – Part 10 for Drinking Water, New Mexico Administrative Codes ("NMAC").

The Water Conservation Fund (WCF) created under the New Mexico" Environmental Improvement Act" §74-1-13, (NMSA 1978A) is a water conservation fee that is imposed for public water supply systems. In return, the funds generated for the WCF fee covers the state's cost of collecting and analyzing drinking water samples for compliance, training for PWS operators and vulnerability assessments of water sources.

Each PWS pays a water conservation fee of three cents ($.03) per 1,000 gallons of water produced into the DWB WCF. This fee enables the proper testing of all public water systems to ensure they meet the requirements of the SDWA.

The DWB WCF in conformance with the state's " Environmental Improvement Act" (NMSA 1978), NMAC 20.7.10,amd SWDA and other applicable federal regulations–DWB WCF uses NM water conservation fees for DWB's water sampling program generates and provides legally defensible scientific data to determine compliance with the requirements of state and federal drinking water regulations. The DWB collects chemical and radiological samples to meet responsibilities pursuant to grants and state and federal requirements and provide oversight to PWS throughout NM. These efforts support the larger goal to ensure that PWSs preserve, protect, and improve NM's drinking water quality supplies for present and future generations.

1.8.2 Problem Definition

All water systems that serve at least fifteen service connections or regularly serve an average of at least twenty-five individuals daily at least 60 days out of the year are considered to be a PWS regulated under the SDWA. Drinking water contamination may be caused by numerous sources such as improperly disposed of chemicals; animal wastes; pesticides; human threats; wastes injected underground; and naturally occurring substances. Likewise, drinking water that is not properly treated or disinfected, or which travels through an improperly maintained distribution system, may also pose a health risk.

PWSs are required to be monitored regularly to verify that the water they provide to the public meets all state and federal drinking water regulations to ensure the protection of public health. The data collected as part of the DWBs WCF's Monitoring Program are used by the PWS and the DWB to determine compliance with these regulations. How often and where samples are taken varies from system to system and contaminant to contaminant. This information is then provided to the population served on an annual basis, at a minimum, or immediately whenever there is a potential risk to public health.

1.9 QA PROJECT PLAN TASK DESCRIPTION

DWB sampling staff and certified operators/samplers collect water quality samples from various locations at PWS throughout the state based on the *Standardized Monitoring Framework* (EPA 2004).

The *Standardized Monitoring Framework* was developed to standardize, simplify, and consolidate monitoring requirements across contaminant groups resulting in simplified monitoring plans and synchronized monitoring schedules that sampling staff can better manage. The DWB WCF Group Manager coordinates with PWSS group and sampling staff on a regular basis to identify sampling needs and establish sampling schedules for each PWS. These sampling schedules are maintained in SDWIS and are reviewed regularly and adjusted as necessary. See **Appendix B.**

Water quality samples can be collected from numerous locations within a single PWS depending on the size and complexity of the system. Samples are collected from locations such as sources, surface water intakes, entry points, distribution, and treatment areas. Contaminants of concern for which samples are analyzed include the *National Primary Drinking Water Standards* (40 CFR 141) as well as the *National Secondary Drinking Water Contaminants* (40 CFR 143). These contaminants consist of various organic, inorganic, radionuclide, disinfectant, disinfection byproduct, and microbiological contaminants. The primary standards protect drinking water quality by limiting the levels of specific contaminants that are known or are anticipated to occur in water and can adversely affect public health. Secondary standards are guidelines for contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color). Additional contaminants are also monitored as required for inclusion in Consumer Confidence Reports (sodium and nickel) or as required in the State of NM Drinking Water Regulations (20.7.10 NMAC).

1.10 QUALITY OBJECTIVES & CRITERIA FOR DATA MEASUREMENT

The establishment of quality objectives ensures that the DWB makes decisions relating to water quality management that are:

- consistent with the mission, goals, and objectives of the NMED and DWB;
- based on proper application of policy and guidance;
- based on all available pertinent information;
- based on a thorough understanding of the information; and
- based on accurate information.

Data Quality Objectives (DQOs) are statements about how certain the decision-maker wants to be about the decision that will be made based on the data. For DWB routine and compliance monitoring, data collected to make compliance determinations should be of sufficient quality to provide a high level of confidence in the resulting decisions.

1.11 SPECIAL TRAINING & CERTIFICATIONS

All DWB personnel are required to be familiar with this QAPP, the DWB's *Quality Management Plan* (QMP), and any other policies and procedures pertinent to the project. Supervisors will provide these and other applicable documents to all new staff.

1.11.1 Special Training

There are no special training requirements aside from the training associated with the sampling certification described below. As resources allow DWB staff are encouraged to seek out and attend appropriate trainings, workshops, or other informative events and to share what they have learned with other staff. Information pertaining to attendance at these types of events is maintained in personnel files. Supervisor approval is required prior to attending any such events.

1.11.2 Driving Certification

Drinking water sampling requires travel to and from the sampling locations. In accordance with NMED Vehicle Use Policy and Procedure 07-07 and 1.5.3.12 NMAC, all DWB personnel must adhere to the requirements specified in these documents and are required to complete the National Safety Council Defensive Driving Course and retain a copy of the Defensive Driving training certificate while operating state vehicles.

1.11.3 Water Sampling Certification

The DWB and PWS personnel who are responsible for collecting drinking water quality samples are all required to be a certified sampler in accordance with 20.7.4.12 NMAC. The certification levels are described in **Table 3**. Copies of all training records and certificates are maintained in the DWB personnel files and/or by the appropriate PWS. Each level of certification requires a high school diploma (or equivalent), 10 training credit hours and the successful completion of a written certification examination.

Table 3. Water Sampling Certification Requirements

Type of Water Sampling	Population Served	
	25 to 500	> 501
Microbiology	Small Water or Water Sampling Technician 1	Water Sampling Technician 1
Chemical and Radiological	Water Sampling Technician 2	Water Sampling Technician 2

1.11.4 Laboratory Certification

Any compliance water sample must be analyzed by a NM certified lab. Certification involves formal approval by the DWB indicating that the laboratory is capable of producing accurate analytical data and is authorized to analyze drinking water samples for compliance purposes. A list of currently certified laboratories is available at: https://service.web.env.nm.gov/urls/xzSRImOI.

1.12 DOCUMENTATION & RECORDS

1.12.1 Documentation

This QAPP and referenced procedures include methods related to the collection, processing, analysis, reporting and tracking of environmental data. This QAPP is reviewed and updated annually, upon approval it is made available to DWB staff and project personnel identified on the Distribution List in **Section 1.1** of this QAPP. The QA Officer ensures distribution of the approved QAPP.

Data generated from projects covered by this QAPP must be of sufficient quality to withstand challenges to their validity, accuracy, and legality. To meet this objective, data is recorded in standardized formats and in accordance with prescribed procedures. The documentation of all environmental data collection activities must meet the following minimum requirements:

- Data and associated information must be documented directly, promptly, and legibly. All reported data must be uniquely traceable to the raw data. Data reduction/transformation formulas must be documented,
- All original data records include, as appropriate, a description of the data collected, units of measurement, unique sample identification (Request Identification [RID] number), station or location identification (if applicable), name (signature or initials) of the person collecting the data, and date of collection,
- Any changes to the original (raw data) entry must not obscure the original entry. The reason for the change must be documented, the change must be initialed and dated by the person making the change and approved by the DWB Data Supervisor or WCF Manager.

Other specific documentation requirements are discussed throughout this QAPP and referenced procedures.

1.12.2 Records

Table 1-4 describes how records are maintained at the DWB. Records retention periods for the DWB files are in accordance with applicable State and Federal Regulations (20.7.10 NMAC; 40 CFR 141; 40 CFR 142; 40 CFR 143).

Table 4. DWB Records Repositories

ECF	Electronic Central Files	Electronic repository for digital copies of information specific to individual PWS such as Sanitary Survey Reports, Notices of Violation, general correspondence, etc.
SDWIS	Database maintained by NMED IT & DWB	Electronic repository for information specific to individual PWS such as board and operator contact information, inventory information, water quality data, and information pertaining to monitoring and compliance schedules, violations, and any enforcement actions.
DWB Sample Collection Application	Online application	Web-based tool that is updated from the SDWIS database daily. Once registered with a password and assigned to a water system sample collectors and PWS operators can view the compliance sample schedules assigned to the water system and automatically prepare a *Sample Request Form* for any lab that DWB has on contract with all the proper demographic information pulled from SDWIS to minimize any errors.

1.13 REPORTING REQUIREMENTS

The primary means of reporting the results obtained through the Drinking Water Sampling Program is through the Lab-To-State application. This application is only available to laboratories that have registered for the application through the DWB. This allows laboratories to directly upload their results into the SDWIS database and to check for upload errors during the process.

The primary means of viewing data within the SDWIS database is Drinking Water Watch. This is a publicly accessible web-based application that allows users to search for information relating to specific water systems located in NM. The tool provides reports on information such as drinking water compliance monitoring results, violations, enforcement actions, contact information, etc.

Each year the NMED DWB also prepares and submits to EPA *New Mexico's Annual Public Water Systems Compliance Report*. The purpose of the report is to provide the public with a summary of the different types of drinking water violations accrued by PWSs during the previous calendar year. The report is a mandated requirement of the federally funded Public Water System Supervision (PWSS) Program and encompasses drinking water violations that were verified during a given calendar year. The report can be found at the following link: https://service.web.env.nm.gov/urls/xzSRImOI .

PART 2: QA PROJECT PLAN DATA GENERATION AND ACQUISITION

Sampling for most drinking water samples collected under the scope of this QAPP is prescribed by State and Federal Drinking Water Regulations. Sample parameters, frequencies and locations vary greatly depending on numerous factors such as system type and size; source of water and distance from potential contamination; treatment methods; etc.

2.0 SAMPLING PROCESS & PARAMETERS

The parameters which are sampled for as part of the DWBs Sampling Program include the specific contaminants listed in the National Primary and Secondary Drinking Water Regulations and are provided in **Table 5.**

2.1.1 Microbiological Contaminants

Microbiological contaminants can be a potential health threat to humans by causing gastrointestinal illnesses that result in diarrhea, vomiting and/or cramps. Coliform bacteria tend to be found in decaying organic matter and the intestinal tract of humans and animals, but it is not usually harmful to human health. The presence of coliform bacteria in the distribution systems of public water supplies is used as an indicator that more dangerous microbiological contamination may be present.

2.1.2 Disinfection Byproducts (DBPs)

The Disinfection Byproducts (DBP) Rule applies to all PWSs that add a chemical disinfectant, except for transient water systems that add a disinfectant other than chlorine dioxide. This rule requires these water systems to monitor for disinfection byproduct contaminants and disinfectants within the system. Potential health risks from these disinfectants and disinfection byproducts include an increased risk of cancer, anemia, and liver, kidney, or central nervous system problems.

2.1.3 Inorganic Chemicals (IOCs)

Inorganic chemicals include metals, salts, and other compounds that do not contain carbon such as fluoride, heavy metals, and nitrates. These chemicals sometimes contaminate water supplies as a result of human activity; however, many are naturally occurring in certain geographic areas. Potential health risks from inorganic contaminants are wide ranging and include skin problems; kidney, liver, and nervous system problems; increases in blood pressure; and bone disease. Excess nitrates are a serious risk to infants, potentially causing Blue Baby Syndrome which can result in death.

Note: PWSs are generally required to monitor at least annually to determine compliance with the nitrate MCL. Several analytical methods for nitrate and/or nitrite are available for total nitrate and nitrite. Once a sample meets or exceeds 5 mg/L with a total nitrate and nitrite analysis, EPA encourages subsequent analysis for nitrate be conducted

using a nitrate only method. Exceedance of either the nitrate MCL (10 mg/L) or total nitrate and nitrite MCL (10 mg/L) requires a Tier 1 public notification. Systems that detect total nitrate and nitrite must report these results in their Consumer Confidence Reports. If the levels are above 5 mg/L, but equal to or below the MCL, the system must provide additional health information in their Consumer Confidence Reports. See **Appendix C** for the EPA guidance memo regarding Nitrate-Nitrite monitoring, confirmation samples, and public notice and NMED Staff Guidance Use of Nitrate + Nitrite (total) Analysis for Compliance Determinations with Nitrate Maximum Contaminant Level.

2.1.4 Organic Chemicals (VOCs and SOCs)

Organic chemicals are compounds that contain one or more carbon atoms. Sources of organic chemical compounds can be natural, such as from decaying vegetation, or anthropogenic. Organic chemicals that are regulated in drinking water typically come from industrial and agricultural activities and include substances such as components of pesticides and industrial and commercial products.

2.1.5 Radionuclides

Radionuclides occur naturally in the environment and through erosion of natural deposits can enter drinking water supplies and pose a potential health risk to humans. Adverse health effects include increased risk of cancer and potential kidney toxicity.

Table 5. List of Analytes for Drinking Water

Inorganic Compounds	Volatile Organic Compounds
Asbestos (fibers >10 micrometers)	1,1,1-Trichloroethane
Cyanide, total	1,1,2-Trichloroethane
Fluoride	1,1-Dichloroethylene
Nitrate + Nitrite	1,2,4-Trichlorobenzene
Nitrite (measured as Nitrogen)	1,2-Dichloroethane
Heavy Metals	1,2-Dichloropropane
Antimony	Benzene
Arsenic	Carbon tetrachloride
Barium	Chlorobenzene

Beryllium	cis-1,2-Dichloroethylene
Cadmium	Dichloromethane
Chromium (total)	Ethylbenzene
Copper	Ethylene dibromide
Lead	o-Dichlorobenzene
Mercury	p-Dichlorobenzene
Selenium	Styrene
Sodium	Tetrachloroethylene
Thallium	Toluene
Lead & Copper Suite	trans-1,2-Dichloroethylene
Radionuclides	Trichloroethylene
Beta particles and photon emitters	Vinyl chloride
Gross Alpha particles	Xylenes (total)
Uranium, combined	SOCs
Uranium 234 & 238	1,2-Dibromo-3-chloropropane (DBCP) & EDB
Radium 226	Polychlorinated biphenyls, total (PCB)
Radium 228	2,4,5-TP (Silvex)
Strontium 89 & 90	2,4-D
Tritium	Acrylamide
Secondaries for Baseline of new wells	Dalapon
Aluminum	Dinoseb
Chloride	Pentachlorophenol
Color	Picloram

Copper	Alachlor
Foaming Agents	Atrazine
Iron	Benzo(a)pyrene (PAHs)
Manganese	Chlordane
Nitrite	Di(2-ethylhexyl) adipate
Odor	Di(2-ethylhexyl) phthalate
pH	Endrin
Silver	Heptachlor
Sulfate	Heptachlor epoxide
Total Dissolved Solids	Hexachlorobenzene
Zinc	Hexachlorocyclopentadiene
Microbiological	Lindane
Total Coliform/E. coli (P/A)	Methoxychlor
Enumeration of E. *coli*	Simazine
Crypto and Giardia	Toxaphene
DBPs	Carbofuran
Bromate	Oxamyl (Vydate)
Bromide	Glyphosate
Haloacetic acids (HAA5)	Endothall
Total Trihalomethanes (TTHMs)	Diquat
Total Organic Carbon (TOC/DOC)	Dioxin (2,3,7,8-TCDD)
See Appendix D for the Maximum Contaminant Limits associated with these parameters.	

2.2 SAMPLE LOCATION & FREQUENCY

Sample schedules are maintained in SDWIS for all regulated public water systems and are updated as necessary. The general requirements for the sampling process are summarized in **Table 6.**

Table 6. Drinking Water Sampling

SAMPLE GROUP	REFERENCE	SAMPLING SUMMARY
Disinfection Byproducts	40 CFR 141.132 141.621	Systems must take all samples during normal operating conditions. Frequency and location depend on the type and size of system.
Inorganic Chemical Sampling	40 CFR 141.23	Groundwater systems collect samples at every entry point to the distribution system which is representative of each well after treatment. Surface water systems collect samples at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment. If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions, i.e., representative of all sources being used. Frequency of sampling depends on the size and type of the public water system as well as the chemical parameter.
Organic Chemical Sampling	40 CFR 141.24	Groundwater systems collect samples at every entry point to the distribution system which is representative of each well after treatment. Surface water (or combined surface/groundwater) systems collect samples at points in the distribution systems that are representative of each source or at each entry point to the distribution system after treatment. If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions, i.e., representative of all sources being used. Frequency of sampling typically starts at four consecutive quarterly samples for each regulated organic contaminant and is then evaluated for potential modification based on various factors such as previous analytical results, proximity of system to potential sources of

		contamination, number of people served, etc. Resulting waivers and/or modifications are specified in the approved sample siting plan for each system.
Radionuclides	40 CFR 141.26	All existing community water systems using groundwater, surface water or both must sample at every entry point to the distribution system that is representative of all sources being used under normal operating conditions. Frequency of sampling typically starts at four consecutive quarterly samples for each regulated contaminant and is then evaluated for potential modification based on previous analytical results.
Unregulated Contaminants	40 CFR 141.40	Applies only to systems that are selected by EPA. Sampling parameters, locations and frequencies are assigned by EPA.
Lead & Copper	40 CFR 141.86	Water systems conduct a materials evaluation of its distribution system to identify a pool of targeted sample sites that meet the regulatory requirements. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants. Number of samples and frequency of sampling depends on the size and type of system.
Source Water Monitoring	40 CFR 141.701	Initial sampling is conducted twice per month for 12 months or at least monthly for 24 months. After the initial monitoring period frequency and location of sampling will depend on the results of the initial monitoring and vary based on system size and source water type and location.

2.3 REQUIRED SAMPLING MATERIALS & PROCEDURES

The purpose of this section is to provide information on how drinking water samples will be collected consistently between locations, by all sampling teams, with no contamination being introduced during collection. The following sections provide instructions for each group of samples collected from drinking water systems. See Appendix E for the method specific sample containers, reagents, and hold times.

2.3.1 Materials for Sampling

- Appropriate sample containers as provided by the laboratory
- Labels supplied by the laboratory
- Sample request forms (Chain of Custody
- Pen/sharpie
- Nitrile or latex gloves
- Cooler
- Ice
- Plastic bags to keep samples dry in cooler
- Alcohol
- pH paper
- Chlorine residual test kit

2.3.2 General Sampling Procedures

1. Obtain sample containers and labels from the laboratory. Store bottles in a cool dry place prior to use. If bottle is dirty or becomes contaminated, do not use it. Bring extra bottles to every sampling event
2. Label bottle using the label provided by the laboratory. Labels should include the sampling location, date and time and any other information required by the analytical laboratory.
3. Complete sample request forms completely and in ink. Bring extra forms to every sampling event.
4. Use gloves to prevent contamination.
5. Select an approved sampling point.
6. Remove any aerators from the tap. (Unless sampling for compliance with the Lead and Copper Rule.)
7. Flush the line for a sufficient amount of time to ensure there is no debris in the faucet and to allow the temperature to stabilize. (Unless sampling for compliance with the Lead and Copper Rule.)
8. Collect the sample.
9. Cool the sample. Sample must be chilled to a temperature of $4 \pm 2°C$ for storage and/or transport to laboratory.
10. Place sample bottles in plastic bag and store and transport in cooler with ice. Samples that will be in direct contact with ice must be placed inside a zip-lock bag to prevent contact with melted ice. Do not allow samples to freeze.
11. Deliver samples to laboratory. Allow ample time for sample to be processed and analyzed by laboratory.

2.4 ENTRY POINT SAMPLING PERFORMED BY THE WCF SAMPLING TEAM

Inorganic Chemical Sampling: Inorganic chemical sampling is broken into several different sampling suites, each with their own sampling procedures. The following sections describe the different sampling suites and include the sampling procedures.

2.4.1 Heavy Metals Specific Sampling Procedure

1. Use a plastic container with a volume of at least 500 mL.
2. Container may be pre-preserved to a pH of ≤ 2 with HNO_3 or you may request that the laboratory preserve the sample after collection. If the sample needs to be preserved at the laboratory this must be noted on the sample request form/COC.
3. Hold time is 2 weeks without preservation, and 6 months after it is preserved with nitric acid (HNO_3), *except for mercury-hold time is 28 days*.

2.4.2 Nitrate-Nitrite Specific Sampling Procedure

1. Use a 100 mL plastic sample container and add 2 mL H_2SO_4 after the sample has been collected.
2. Hold time is 28 days.

2.4.3 Cyanide Specific Sampling Procedure

1. Use a 1 L cubitainer, add 0.6 g of ascorbic acid (if sample is chlorinated) and 8-12 pellets of NaOH before sampling.
2. Hold time is 14 days.

2.4.4 Fluoride Specific Sampling Procedure

1. Use a plastic sample container with a volume of at least 100 mL and no added preservative.
2. Hold time is 28 days.

2.4.5 Secondaries Specific Sampling Procedures

- The following parameters are collected to determine the baseline of new wells:
- Aluminum-Hold time is 6 months.
- Chloride-Hold time is 28 days.
- Color-Hold time is 48 hours.
- Copper-Hold time is 6 months.
- Surfactants/Foaming Agents-Hold time is 48 hours.
- Iron-Hold time is 6 months.
- Manganese-Hold time is 6 months.
- Nitrite-Hold time is 48 hours.
- Odor-Hold time is 24 hours.

- pH-Analyze immediately.
- Radiological (4 quarter composite)-hold time is 12 months
- Silver-Hold time is 6 months.
- Sulfate-Hold time is 28 days.
- Total Dissolved Solids-Hold time is 7 days.
- Zinc-Hold time is 6 months

Note: The sample containers are provided by Hall Analytical Environmental Laboratory who perform the required analyses as the NM Department of Health Scientific Laboratory Division (SLD) does not perform these tests. Due to the short hold times for the analyses the samples cannot be sent out of state. The general sampling procedures apply to these samples and the sample containers are provided with the appropriate reagents already in the containers.

- 1-500 mL plastic container, unpreserved.
- 1-500 mL plastic container, preserved with HNO_3.
- 1-500 mL plastic container, preserved with H_2SO_4.
- 1-1 L amber glass, unpreserved.
- 2-1 GL (gallon) cubitainers, preserved with HNO_3 each quarter that the radiological composite is collected.

2.5 ORGANIC CHEMICAL SAMPLING

Organic chemical sampling is broken into several different sampling suites, each with their own sampling procedures. The following sections describe the different sampling suites and include the sampling procedures.

Special precautions must be taken when sampling for organic contaminants to avoid contamination. Water is a very good solvent for many organic chemicals and when exposed to air, water can absorb volatile organic gases that may be present. Always observe the following precautions when collecting organic chemical samples:

- Check all sampling kits to ensure all bottles and preservatives are present.
- Do not fuel up vehicle prior to collection samples.
- Do not smoke (tobacco smoke contains VOCs.
- Do not use hairspray/mousse, cologne/perfume, or breathe/spray mouthwash (all contain VOCs).
- Wear nitrile or latex gloves when sampling.
- Turn off vehicle (exhaust contains VOCs).
- Use well-ventilated area and avoid collecting samples in enclosed areas that contain heavy chemical odors.

2.5.1 VOC Sampling Procedures

1. Use two 40 mL glass vials with Teflon septum.
2. Sample vials contain ascorbic acid (chlorinated samples) and is preserved with HCl.
    3. Remove the cap and hold the vial at a 45˚ angle. Position the vial as close to the faucet as possible and make sure the stream hits the side of the vial as it fills. Slowly fill the vial and ensure that it does not overflow.
    4. Replace the cap without getting any air in the sample vial. There are two methods to doing this:
        a. Fill the vial until there is a convex meniscus (bulging over the rim). Carefully slide the septum across the top of the vial and then screw on the cap.
        b. Fill the vial to get a convex meniscus and fill the cap (don't remove the septum) with water. Hold the inverted lid next to the rim of the vial and carefully flip the cap over the top and screw it down.
    5. Check to make sure there are no air bubbles in the sample. If bubbles are present, remove the cap, add a little more water and try again.
    6. Hold time is 14 days.

2.5.2 SOC Sample Suite Sampling Procedures

There are seven individual analyses associated with the SOC sample suite. Due to the shorter holding time, arrangements with the analytical laboratory should be made in advance.

2.5.3 VOC II Sampling Procedures

These samples should be collected from a site that is upstream of chlorination to avoid contamination with TTHMs, which interfere with this test.

1. Use two 40 mL glass vials with Teflon septum 3 mg of $Na_2S_2O_3$, added at laboratory.

2. Remove the cap and hold the vial at a 45˚ angle. Position the vial as close to the faucet as possible and make sure the stream hits the side of the vial as it fills. Slowly fill the vial and ensure that it does not overflow.

3. Replace the cap without getting any air in the sample vial. There are two methods to doing this:

    a. Fill the vial until there is a convex meniscus (bulging over the rim). Carefully slide the septum across the top of the vial and then screw on the cap.

b. Fill the vial to get a convex meniscus and fill the cap (don't remove the septum) with water. Hold the inverted lid next to the rim of the vial and carefully flip the cap over the top and screw it down.

4. Check to make sure there are no air bubbles in the sample. If bubbles are present, remove the cap, add a little more water and try again.
5. Hold time is 14 days to extraction at the lab and then 14 days for analysis.

2.5.4 Acid Herbicide Sampling Procedures

1. Use two 250 mL amber glass bottles, 12.5 mg $Na_2S_2O_3$, added at laboratory.
2. Remove the cap; slowly fill the bottle to the curve of the shoulder.
3. Replace the cap and invert bottle several times to make sure the $Na_2S_2O_3$ is dissolved.
4. Hold time is 14 days to extraction, 21 days to analysis.

2.5.5 SOC Sampling Procedures

1. Use two 1 L amber glass bottles, 50 mg Na_2SO_3, added at laboratory and 2 mL HCl added by sampler.
2. Remove the cap; slowly fill the bottle to the curve of the shoulder.
3. Replace the cap and invert bottle several times to make sure the Na_2SO_3 is dissolved.
4. Wait at least 2 minutes for de-chlorination to take place and then add 1 dropper of HCl into each of the two SOC bottles until pH is ≤ 2.
5. Hold time is 14 days to extraction, 30 days to analysis.

2.5.6 Carbamate Sampling Procedures

1. Use two 40 mL vial, 0.375 grams of citrate buffer and $Na_2S_2O_3$, added at laboratory.
2. Slowly fill the vial and cap it. *Air bubbles are not an issue.*
3. Hold time is 28 days.

2.5.7 Glyphosate Sampling Procedures

1. Use one 40 mL amber glass vial with 4 mg of $Na_2S_2O_3$ added by laboratory.
2. Slowly fill the vial and cap it. *Air bubbles are not an issue*.
3. Hold time is 14 days.

2.5.8 Endothall Sampling Procedures

1. Use one 250 mL amber glass bottle, 20 mg $Na_2S_2O_3$, added at laboratory.
2. Open the tap and let the water run for ~30 seconds to ensure no debris is in faucet. Reduce the flow from sampling point to an un-aerated stream.
3. Slowly fill the bottle and cap it.
4. Hold time is 7 days to extraction, 14 days to analysis.

2.5.9 Diquat Sampling Procedures

1. Sample bottles will be one amber 1 L PPE bottle with 100 mg $Na_2S_2O_3$ added at laboratory.
2. Hold time is 7 days to extraction, 21 days to analysis.

2.5.10 Radionuclide Sampling Specific Sampling Procedures

1. Collect the sample using two 1-gallon cubitainers.
2. Sampler does not need to add HNO_3 to bring the pH $\leq$ 2 but it must be noted on the sample request form/COC if the sample needs to be preserved at the laboratory.
3. Hold time is 5 days unpreserved, and 6 months after preservation.

2.6 DISTRIBUTION SYSTEM SAMPLING PERFORMED BY THE PUBLIC WATER SYSTEM

2.6.1 Microbiological Specific Sampling Procedures

1. Never use a kitchen sink faucet that swivels or an outdoor faucet that drips. Any hoses, vacuum breakers or other attachments must also be removed. The least-used faucet at the site is preferred because there is less chance of contamination of the faucet. If an indoor faucet is selected, make sure the sink and faucet are clean. Never collect a sample from a hot water faucet. Remove the aerator screen (it might be contaminated).
2. Disinfect the faucet with alcohol if necessary.
3. Open the tap and let the water run for 3-5 minutes. This will ensure that the water being sampled is from the main and has not been standing in the customer's plumbing.
4. Once the line is properly flushed, throttle the flow down to an un-aerated stream.
5. Run a chlorine residual analysis following the instructions in the test kit. Record results on sample request form.
6. Remove the cap, making sure to not touch the inside of the cap or the top of the sample bottle. Don't aerate the sample or allow it to splash on the outside of the bottle. Don't blow or breathe into the sample bottle.
7. Hold the bottle at a 45° angle while filling it. Fill bottle to fill line (within 1 inch from top) to ensure that there is 100 mL of sample in bottle. Do not overfill or pour excess water. If overfilled, use extra bottle. Leave air space in bottle to allow room to agitate prior to analysis.
8. Never set cap down or leave off for extended periods. Hold cap so that it is facing down at all times and securely replace lid after sample is collected.
9. Hold time is 30 hours; samples must be delivered to laboratory within 24 hours.

2.7 DISINFECTION SPECIFIC SAMPLING PROCEDURES

There are two different sets of samples associated with the disinfection byproducts kit. Samples are analyzed for total trihalomethanes (TTHMs) and the haloacetic acid group (HAA5).

2.7.1 TTHM Sampling Procedures

1. Use two 40 mL glass vials with a Teflon septum. Remove the cap and hold the vial at a 45˚ angle. Position the vial as close to the faucet as possible and make sure the stream hits the side of the vial as it fills. Slowly fill the vial and ensure that it does not overflow.
2. Replace the cap without getting any air in the sample vial. There are two methods to doing this:
    a. Fill the vial until there is a convex meniscus (bulging over the rim). Carefully slide the septum across the top of the vial and then screw on the cap.
    b. Fill the vial to get a convex meniscus and fill the cap (don't remove the septum) with water.
3. Hold the inverted lid next to the rim of the vial and carefully flip the cap over the top and screw it down.
4. Check to make sure there are no air bubbles in the sample. If bubbles are present, remove the cap, add a little more water and try again.

2.7.2 Haloacetic Acid Sampling Procedures

1. Use two 60 mL amber glass vials, each with 6 mg of NH_4Cl.Remove the cap and hold the vial at a 45° angle. Position the vial as close to the faucet as possible and make sure the stream hits the side of the vial as it fills. Slowly fill the vial and cap it. *Air bubbles are not an issue.*
2. Agitate the vial for one minute to dissolve the NH_4Cl.
3. Hold time is 14 days to extraction and 14 days to analysis.

2.8 LEAD & COPPER SPECIFIC SAMPLING PROCEDURES

The Lead and Copper Rule was designed to ensure that samples are collected from locations which have the highest risk of elevated lead concentrations. The rule established a tiering system that guides PWS in selecting locations for tap sampling that are considered high risk and requires that the sampling pool be comprised of Tier 1 sites if they are available [see 40 CFR 141.86)a)].

Lead and copper samples differ from other heavy metals in that these samples must be collected as a "first draw." For a sample to be considered "first draw," water must have been standing in the customers plumbing for at least 6 hours but should not have been standing in the pipe for more than 18 hours. The sampling location should be an interior tap typically used for consumption such as a cold-water kitchen or bathroom sink tap in residences.

Because the sample must be taken per the procedures described above, these samples are often collected by customers. If this is the case, the PWS must make sure that the individual responsible for collecting the sample understands how to do it correctly. As added insurance that the system gives proper instructions, the rule does not allow a PWS to challenge sample results based on alleged homeowner errors in sample collection. Preservation can be done by the sampler or the laboratory after the sample has been collected.

1. Sample is collected in a 1 L plastic cubitainer
2. Do **NOT** flush the faucet.
3. Do **NOT** remove any aerators.
4. Hold time is 2 weeks without preservation, and 6 months after it is preserved with HNO_3.

2.9 SAMPLE HANDLING & CUSTODY

This section describes the DWB's efforts to ensure that each sample collected retains its original physical form and chemical composition from time of collection through final disposal

2.9.1 Sample Handling

For the Sample handling procedures, refer to Refer to section 2.3, *Required Materials and Sampling Procedures* within this QAPP.

2.9.2 Sample Custody

All samples collected by the DWB require an associated COC to ensure the integrity of the sample and to track the possession and handling of each sample from the point of sample collection through the laboratory analysis. The chain of custody for each sample is included on the Sample Request Form/COC.

2.10 QUALITY CONTROL

Quality control activities are technical activities performed on a routine basis to quantify the variability that is inherent to any environmental data measurement activity. The purpose for conducting QC activities is to understand and incorporate the effects this variability may have in the decision-making process. Additionally, the results obtained from QC activities may identify areas where the variability can be reduced or eliminated in future data collection efforts, thereby improving the overall quality of the program or project being implemented.

2.10.1 Field Quality Control

The DWB controls the quality of the data by using standardized methods as described in this QAPP. Newly hired DWB field personnel will learn sampling techniques through training and certification. All personnel who collect drinking water samples must be familiar with and collect data in accordance with the procedures as they are defined. The collection of field QC samples is an important part of the continuing

effort to improve the quality of the data by assessing and possibly refining the collection, transportation, and handling techniques.

The DWB uses repeat/confirmation samples and trip blank samples to ensure data quality. A repeat sample is a sample taken following a positive coliform result. A confirmation sample is taken following a chemical result at or above the MDL for SOC/VOC1 analyses, or above the MCL for all other chemicals. A trip blank is a sample of analyte-free water that is prepared in the laboratory. Trip blanks are used for volatile organic compound samples only. Trip blanks are prepared by the analytical laboratory using deionized, distilled water, and preserved as required. They are transported, unopened, to the field with other sample containers, handled like environmental samples and shipped to the laboratory for analysis with the collected samples. Trip blanks are used to identify contamination that might occur during sample transport and analysis rather than during sample collection and processing.

2.10.2 Laboratory Quality Control

All samples are analyzed by laboratories that are certified by the NMED Drinking Water Laboratory Certification Program (DWLCP) and have established QA programs that implement the following key elements:

- Demonstrate the laboratory's capability and qualifications to perform environmental analyses by summarizing and documenting the QA procedures employed by the laboratory,
- Control laboratory operations by establishing procedures that measure the laboratory's performance on a daily, weekly, monthly, quarterly, and yearly basis,
- Measure matrix effects to determine the effect of a specific matrix on method performance and analyte recoveries, and;
- Provide a means of ensuring that appropriate QC information is consistent, available, and recoverable, to enable the end user to assess the quality of the data.

Further information may be found in the current DWLCP Guidance Manual which is available at the following link: https://cloud.env.nm.gov/water/?r=7943&k=e269989cae

2.11 INSPECTION OF SUPPLIES & CONSUMABLES

- To ensure that the correct field and analytical supplies are available for sample collection the DWB thoroughly inspects all supplies upon receipt and prior to sampling. Typical supplies that require inspection by DWB staff include:
- Chemical reagents.
- Sample containers.
- Coolers for sample transport.

2.12 DATA MANAGEMENT

The primary tool used by the DWB to manage data is the Safe Drinking Water Information System (SDWIS) developed by EPA and customized by each state to meet both federal and State specific needs. The following sections describe the data management processes for each type of data generated by the DWB.

2.13 MICROBIOLOGICAL DATA

Microbiological/bacteriological sampling is performed by the PWSs. The process to manage this data is described below.

1. Sample Collection: Sampler obtains *Sample Request Form/COC* and containers and collects the samples according to the procedures described in Section 1.9 of this QAPP. The Sample Request Forms/COCs are provided to the lab along with each sample.
2. Laboratory Analysis: The results of the laboratory analysis are entered into the laboratory's information management system (LIMS), or the Microsoft Access database provided by NMED, which creates an electronic data file for upload.
3. Data delivery: The laboratory uploads the electronic data file into SDWIS using a Lab-To-State utility application. The application pre-checks for errors and produces an error report for any rejected data. The DWB data team works to resolve any errors and resubmit or manually enter corrected results. The data is then ready to be used to determine compliance with the regulations. Electronic pdf copies are sent to the DWB, and hard copies are mailed to the PWS's administrative contact of record.
4. Data QA/QC: The data are validated and verified through a series of automated SDWIS applications. DWB staff follow-up on all flagged or rejected data.

2.14 CHEMICAL & RADIONUCLIDE DATA

1. Sample Collection: Sampler prints *Sample Request Forms* (COCs) using the *Sampler's Application* that is linked to SDWIS. The sampler obtains containers from the laboratory and collects the samples according to the procedures described in Section 1.9 of this QAPP. The sample request forms are provided to the lab along with each sample.
2. Populate Database: The sampler enters information about the samples into the Drinking Water Sample Collection database application.
3. Laboratory Analysis: The results of the laboratory analysis are entered into the laboratory's information management system (LIMS) which creates an electronic data file for upload.

4. Data delivery: The laboratory uploads the electronic data file into SDWIS using a Lab-To-State utility application. The application pre-checks for errors and produces an error report for any rejected data. DWB data team works to resolve any errors and resubmit or manually enter corrected results. The data is then ready to be used to determine compliance with the regulations. Electronic pdf copies are sent to the DWB, and hard copies are mailed to the PWS's administrative contact of record.
5. Data QA/QC: The data are verified and validated through a series of automated SDWIS applications. DWB staff follow-up on all flagged or rejected data.
6. Perform Data Completeness Check: The WCF Manager follows up to obtain any missing data or determine if additional samples need to be collected. The data is then ready to be used to determine compliance with the regulations.

PART 3: QA PROJECT PLAN QUALITY ASSESMENT & OVERSIGNT ELEMENTS

3.0 QUALITY SYSTEM ASSESSMENT AND RESPONSE ACTIONS

The progress and quality of the WCF sampling program shall be continuously assessed to ensure that objectives are met. The WCF Group Manager will periodically evaluate the following:

- Samples schedules are being met.
- Sampling and data management are occurring according to the procedures specified in this QAPP.

Corrective actions are implemented as needed.

The WCF Manager will coordinate with the QA Officer as necessary to discuss any problems that arise and will develop appropriate corrective actions to maintain program integrity. Annual reviews will be conducted to identify areas in need of improvement. If data are found to be consistently outside of the specified Data Quality Objectives, corrective actions will be taken. Corrective act

ions can include additional training for program staff, revised procedures, alternate schedules, etc. All project staff are encouraged to identify problems immediately and provide feedback on program activities and needs. Any resulting program modifications will be documented in subsequent revisions to the QAPP.

3.1 REPORTS TO MANAGEMENT

The WCF Group Manager and QA Officer will periodically perform a project oversight and quality assessment review and produce a summary report of the evaluation. This report will provide an evaluation of the overall status and quality assessment findings and will include the results of any Quality Assurance Audits that have been conducted. The report will include program updates and will identify any changes that were made or that are needed. This report will be provided to all parties included on the Distribution List in **Section 1.1** of this QAPP.

PART 4: DATA VALIDATION & USABILITY

4.0 DATA REVIEW, VERIFICATION, USABILITY, & VALIDATION

All data collected by the DWB undergo a series of checks to ensure that the data are of sufficient quality and conform to a project's specific objectives. The following sections describe the procedures used to determine to accept, reject, or qualify data generated as part of the DWB Sampling Program.

4.1 VERIFICATION & VALIDATION METHODS

Data verification and validation are performed automatically by a series of SDWIS applications. The criteria for flagging and rejecting data are coded into the application. Additional information pertaining to these procedures can be found at: http://water.epa.gov/scitech/datait/databases/drink/sdwisfed/index.cfm.

4.2 RECONCILLATION WITH USER REQUIREMENTS

Data is considered usable once the data verification and validation process has been completed and the data has been accepted, rejected, or qualified. Data is then analyzed to determine compliance using the SDWIS application *Compliance Decision Support*. DWB Compliance staff are then able to take action to address any systems identified as being out of compliance with the drinking water regulations knowing that the determinations were made based on quality data and information. The data and results are also provided to the public for use through the web-based application *Drinking Water Watch*.

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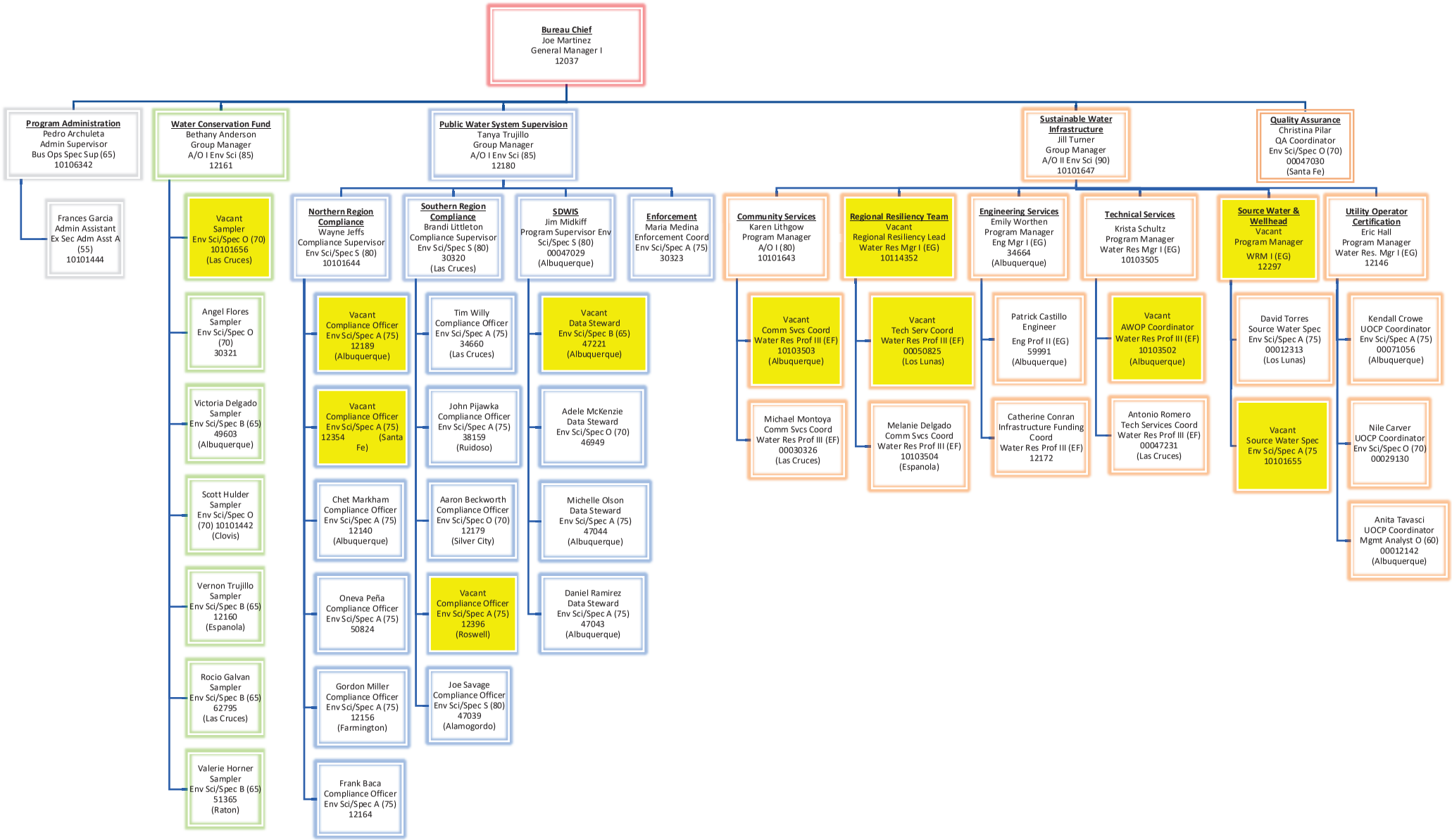
APPENDIX A.

NMED-DRINKING WATER BUREAU ORGANIZATION CHART

NMED-DRINKING WATER BUREAU
ORGANIZATION CHART DECEMBER 2022



APPENDIX B.

EPA: THE STANDARDIZED MONITORING FRAMWORK:

A QUICK REFERENCE GUIDE

EPA
United States Environmental Protection Agency

The Standardized Monitoring Framework: A Quick Reference Guide

Overview of the Framework

Title*	The Standardized Monitoring Framework (SMF), promulgated in the Phase II Rule on January 30, 1991 (56 FR 3526).
Purpose	To standardize, simplify, and consolidate monitoring requirements across contaminant groups. The SMF increases public health protection by simplifying monitoring plans and synchronizing monitoring schedules leading to increased compliance with monitoring requirements.
General Description	The SMF reduces the variability within monitoring requirements for chemical and radiological contaminants across system sizes and types.

*This document provides a summary of federal drinking water requirements; to ensure full compliance, please consult the federal regulations at 40 CFR 141 and any approved state requirements.

Additional Requirements

The SMF outlined on these pages summarizes existing systems' ongoing federal monitoring frequencies only, primacy agencies may have more stringent requirements. Primacy agencies with an EPA-approved waiver program have the flexibility to issue waivers, which take into account regional and state specific characteristics and concerns. To determine exact monitoring frequencies, the SMF must be used in conjunction with any EPA approved waiver program and/or additional requirements as determined by the primacy agency.

Additional sampling to confirm a result also may be required. New water systems may have different and additional requirements as determined by the primacy agency.

Regulated Contaminants

Inorganic Contaminants (IOCs)	Fifteen (15) (Nitrate, Nitrite, and Asbestos are exceptions to SMF)
Synthetic Organic Contaminants (SOCs) & Volatile Organic Contaminants (VOCs)	Fifty-One (51) (Vinyl chloride for ground water systems is an exception to SMF)
Radionuclides	Four (4) (Does not include beta particles and photon emitters)

Applicable PWS

All PWSs	Nitrate Nitrite
CWSs	IOCs SOCs VOCs Radionuclides
NTNCWSs	IOCs SOCs VOCs

Legend for SMF Tables

* = 1 sample at each entry point to distribution system (EPTDS).
** = 2 quarterly samples at each EPTDS. Samples must be taken during 1 calendar year during each 3-year compliance period.
**** = 4 quarterly samples at each EPTDS within time frame designated by the primacy agency.
X = No sample required unless specified by primacy agency. However, waivers must be renewed at the frequency shown and system must demonstrate that the sources are not vulnerable.
# = Systems must monitor at a frequency specified by the primacy agency.
Detect = Federally defined detection limit.

For additional information:

Access the EPA Safe Drinking Water website at https://www.epa.gov/safewater or contact your primacy agency's drinking water representatives.

See 40 CFR 141.23 for IOCs, nitrate, and nitrite; 40 CFR 141.24 for VOCs and SOCs; and 40 CFR 141.26 for Radionuclides.

Office of Water (4606M) EPA 816-F-20-002 May 2020

STANDARDIZED MONITORING FRAMEWORK

		Fourth Cycle									Fifth Cycle								
		1st Period			2nd Period			3rd Period			1st Period			2nd Period			3rd Period		
Inorganic Contaminants (IOCs)	CWSs & NTNCWSs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
	Ground Water																		
	Waiver[1]					*									*				
	≤ MCL and No Waiver		*			*			*			*			*			*	
	Reliably and Consistently < MCL[2]		*			*			*			*			*			*	
	> MCL or Not Reliably and Consistently < MCL[3]	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****
	Surface Water																		
	Waiver[1]					*									*				
	≤ MCL and No Waiver	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	Reliably and Consistently < MCL[2]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	> MCL or Not Reliably and Consistently < MCL[3]	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****
Synthetic Organic Contaminants (SOCs)	**CWSs & NTNCWSs**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**
	All Population Sizes																		
	Reliably and Consistently < MCL[2, 4, 5, 6]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	≥ Detect or Not Reliably and Consistently < MCL[3]	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****
	Waiver with Vulnerability Assessment Every 3 Years[7]		X			X			X			X			X			X	
	Population > 3,300																		
	< Detect and No Waiver		**			**			**			**			**			**	
	Population ≤ 3,300																		
	< Detect and No Waiver		*			*			*			*			*			*	
Volatile Organic Contaminants (VOCs)	**CWSs & NTNCWSs**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**
	Ground Water																		
	Waiver with Vulnerability Assessment Every 3 Years[7, 8]					*						*						*	
	< Detect and No Waiver[9]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	< Detect After at Least 3 Annual Samples[10]		*			*			*			*			*			*	
	Reliably and Consistently < MCL[2, 4, 5]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	≥ Detect or Not Reliably and Consistently < MCL[3]	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****
	Surface Water																		
	Waiver with Vulnerability Assessment Every 3 Years[7]		X			X			X			X			X			X	
	< Detect and No Waiver[9]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	Reliably and Consistently < MCL[2, 4, 5]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	≥ Detect or Not Reliably and Consistently < MCL[3]	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****
Asbestos	**CWSs & NTNCWSs**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**
	Waiver with Vulnerability Assessment Every 3 Years[11]		X			X			X			X			X			X	
	No Waiver, Reliably and Consistently < MCL,[2] or Vulnerable to Asbestos Contamination[12]		*									*							
	> MCL or Not Reliably and Consistently < MCL[3]	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****

STANDARDIZED MONITORING FRAMEWORK

		Fourth Cycle									Fifth Cycle								
		1st Period			2nd Period			3rd Period			1st Period			2nd Period			3rd Period		
Nitrate	CWSs & NCWSs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
	Ground Water																		
	< 1/2 MCL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	Reliably and Consistently < MCL[2, 5]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	≥ 1/2 MCL[13] or Not Reliably and Consistently < MCL	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****
	Surface Water																		
	After 4 Consecutive Quarters < 1/2 MCL[5]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	≥ 1/2 MCL Within Last Four Quarters[13]	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****
	Ground Water and Surface Water TNCWSs																		
	All Systems[13]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Nitrite	CWSs & NCWSs	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
	< 1/2 MCL	#									#								
	Reliably and Consistently < MCL[2, 5]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	≥ 1/2 MCL or Not Reliably and Consistently < MCL	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****
Radio-nuclides	CWSs[14]	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
	< Detect[15]	*						*			*						*		
	≥ Detect and ≤ 1/2 MCL	*						*			*						*		
	> 1/2 MCL and ≤ MCL		*			*			*			*			*			*	
	> MCL[3, 16]	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****	****

[1]Based on 3 rounds of monitoring at each EPTDS with all analytical results < MCL. No monitoring required for cyanide waivers provided that the primacy agency determines that the system is not vulnerable due to lack of any industrial source of cyanide.

[2]A result above a trigger level triggers quarterly sampling at that EPTDS. Trigger level is > MCL for IOCs; > detection limit for VOCs and SOCs; and ≥ 1/2 MCL for nitrate and nitrite. Frequency may be reduced if the primacy agency determines the sampling point is reliably and consistently (R&C) < MCL. No R&C < MCL determination may be made for surface water systems for nitrate.

[3]If the running annual average (RAA) of quarterly sampling is > MCL, the system remains on quarterly monitoring until it meets the conditions to be determined R&C < MCL.

[4]Systems can apply for a waiver after 3 consecutive annual sampling results are below the detection limit.

[5]Annual samples must be taken during the quarter which previously resulted in the highest analytical result.

[6]Primacy agencies must re-confirm every 3 years that the system is not vulnerable or the system must sample based on system population and no waiver.

[7]Systems must update their vulnerability assessments during the time the waiver is effective. Primacy agencies must re-confirm every 3 years that a system is not vulnerable or the system must return to annual monitoring.

[8]Waiver is effective for two compliance periods (6 years), and these periods can span compliance cycles.

[9]If all monitoring results during initial quarterly monitoring are < the detection limit, the system can take annual samples. Systems are also eligible for a waiver.

[10]After a minimum of 3 years of annual sampling all results < the detection limit, they can take 1 sample during each compliance period. Systems are also eligible for a waiver.

[11]Primacy agencies must reconfirm every 3 years that the system is not vulnerable or the system must return to 1 sample in the first 3-year compliance period of every 9-year compliance cycle.

[12]Systems are required to monitor for asbestos during the first 3-year compliance period of each 9-year compliance cycle. A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe must take 1 sample at a tap served by that pipe. A system vulnerable to asbestos contamination at the source must sample at each EPTDS.

[13]An MCL of 20 mg/L may be approved by the primacy agency for NCWSs that do not supply water to children under 6 months of age and additional criteria are met. [CFR 141.11(d)].

[14]Radionuclides information below specifies the requirements for gross alpha particle activity, radium-226, radium-228, and uranium. Beta particle and photon radioactivity are not included, refer to CFR 141.26(b) for more details.

[15]Systems must collect at least one sample every nine years if average of initial monitoring results is < detect.

[16]Systems must sample at least four consecutive quarters with results below the MCL before the monitoring frequency can be reduced.

APPENDIX C.

USE OF TOTAL NITRATE AND NITRITE ANALYSIS FOR COMPLIANCE WITH THE NITRATE MAXIMUM CONTAMINAT LEVEL ("MCL")

C.1 EPA Memorandum "Use of Total Nitrate and Nitrite Analysis for Compliance Determinations with the Nitrate Maximum MCL-40 CFR §141.23

C.2 NMED Drinking Water Bureau Staff Guidance for Use of Nitrate + Nitrite (total) Analysis for Compliance Determinations with Nitrate MCL

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF WATER

November 30, 2020

MEMORANDUM

SUBJECT: Use of Total Nitrate and Nitrite Analysis for Compliance Determinations with the Nitrate Maximum Contaminant Level – 40 CFR §141.23

FROM: Anita M. Thompkins, Director
Drinking Water Protection Division
Office of Ground Water and Drinking Water

ANITA THOMPKINS Digitally signed by ANITA THOMPKINS Date: 2020.11.30 18:44:00 -05'00'

TO: EPA Regional Water Division Directors, Regions I-X

The goal of this memorandum is to provide a consistent approach for compliance determination of the National Primary Drinking Water Regulations (NPDWRs) nitrate maximum contaminant level (MCL) when using a total nitrate and nitrite analysis to ensure public health protection. This memorandum clarifies nitrate monitoring requirements; provides information on analytical methods when using total nitrate and nitrite analysis to comply with the nitrate MCL; and clarifies reporting requirements when using total nitrate and nitrite analysis to comply with the nitrate MCL.

Background

Under the authority of the Safe Drinking Water Act (SDWA), EPA established the MCL for nitrate of 10 milligrams per liter (mg/L) in 1991 at a level that avoids methemoglobinemia (blue baby syndrome). Based on review of Safe Drinking Water Information System (SDWIS) compliance data, EPA is aware that at least half of the primacy agencies allow the use of a total nitrate and nitrite analysis to determine compliance with the nitrate MCL. Data from the last 25 years indicate that nitrate MCL violations occur. In 2018, there were 1,029 nitrate MCL violations issued to 507 systems, representing 7 percent of all of the health-based violations reported that year and impacting 0.3 percent of all systems.[1]

Monitoring

Under 40 CFR §141.23, with the exception of certain consecutive systems [see 40 CFR §141.29], all public water systems (PWSs) are required to monitor at least annually to determine compliance with the nitrate MCL of 10 mg/L listed in 40 CFR §141.62, which also lists an MCL of 10 mg/L for total nitrate and nitrite.

[1] Based on EPA Government Performance and Results Act (GPRA) report of systems in violation report in FY 2018, https://www.epa.gov/ground-water-and-drinking-water/drinking-water-performance-and-results-report.

Analytical Methods
Title 40 CFR §141.23(k) lists the EPA-approved methods for the analysis of nitrate, along with preservation and holding time requirements. The monitoring requirements for total nitrate and nitrite are not specified and are at the discretion of primacy agencies. While the CFR does not list approved methods for compliance with the total nitrate and nitrite MCL, several methods promulgated for the analysis of nitrate and/or nitrite can provide this information.[2]

Sample handling requirements are specified in the NPDWRs. Samples being analyzed for total nitrate and nitrite must be preserved with sulfuric acid and be analyzed within 28 days [40 CFR §141.23(k)(2)]. In contrast, nitrate methods require the sample to be kept at 4˚C and to be analyzed within 48 hours or 14 days for certain chlorinated samples. With the extended holding time for total nitrate and nitrite, in the event of a high result (e.g., exceeds 5 mg/L), there could be a delay in notifying the public and could prolong possible risks for infants exposed to elevated nitrate levels through drinking water.

Because nitrate, nitrite, and total nitrate and nitrite are considered acute contaminants, it is especially critical when using a total nitrate and nitrite method for compliance with the nitrate MCL that samples be analyzed as soon after collection as possible [40 CFR §141.23(k)(2)].[3] Once a sample exceeds 5 mg/L according to a total nitrate and nitrite analysis, the PWS's source has shown a potential for nitrate contamination. Though not required by regulation, EPA encourages that future analyses following an exceedance of 5 mg/L using a total nitrate and nitrite analysis be conducted using a nitrate method specified in 40 CFR §141.23(k), table item 18, rather than a total nitrate and nitrite method.

Public Notice and Reporting
Exposure to elevated nitrates can cause methemoglobinemia in infants, and even short-term exposures can result in severe illness or death. Due to the concern over acute health effects for infants, exceedance of either the nitrate MCL or total nitrate and nitrite MCL requires a Tier 1 public notification (i.e., notification to consumers as soon as practical but no later than 24 hours after the PWS learns of the violation) [40 CFR §141.202].

The federal Consumer Confidence Rule is the cornerstone of the 1996 SDWA "right-to-know" amendments, based on the principle that consumers have a right to know what is in their drinking water. Community water systems using a total nitrate and nitrite analysis must report their results in their Consumer Confidence Reports' detected contaminant table and, where applicable, include information for violations [40 CFR §141.153]. Systems which detect nitrate or total nitrate and nitrite at levels above 5 mg/L, but equal to or below the MCL, must also provide additional health information in their Consumer Confidence Report to ensure that the public is informed of possible risks to infants from drinking water containing elevated concentrations of nitrate [40 CFR §141.154(c)].

If a primacy agency allows the use of total nitrate and nitrite analysis for compliance with the nitrate MCL, the correct reporting code for results under total nitrate and nitrite is SDWIS code 1038.

[2] Methods include ion chromotography (EPA Method 300.0), automatic cadmium reduction (EPA Method 353.2, ASTM D3867-90A and SM 4500-NO3- F), manual cadmium reduction (ASTM D3867–90 B and SM 4500-NO3- E), and reduction/colorimetric (Systea Easy (1-Reagent) and NECi Nitrate-Reductase). Analytical values must be generated with the approved test method within the appropriate holding times. Approved versions of these methods are listed in 40 CFR 141.23 (k)(1) and Appendix A to Subpart C of Part 141.

[3] As stated in 40 CFR § 141.23(k)(2): "In all cases samples should be analyzed as soon after collection as possible."

Summary

PWSs are generally required to monitor at least annually to determine compliance with the nitrate MCL. Several analytical methods for nitrate and/or nitrite are available for total nitrate and nitrite. Once a sample exceeds 5 mg/L with a total nitrate and nitrite analysis, EPA encourages subsequent analysis for nitrate be conducted using nitrate methods. Exceedance of either the nitrate MCL (10 mg/L) or total nitrate and nitrite MCL (10 mg/L) requires a Tier 1 public notification. Systems that detect total nitrate and nitrite must report these results in their Consumer Confidence Reports. If the levels are above 5 mg/L, but equal to or below the MCL, the system must provide additional health information in their Consumer Confidence Reports. The correct reporting code for results under total nitrate and nitrite is SDWIS code 1038.

Please share these clarifications and recommendations concerning nitrate and total nitrate and nitrite with your primacy agencies. If you have any additional questions or concerns regarding this document or other regulatory requirements, please contact Cathy Davis, Manager, Protection Branch at (202) 564-2703 or Davis.CatherineM@epa.gov.

MICHELLE LUJAN GRISHAM
GOVERNOR

JAMES C. KENNEY
CABINET SECRETARY

July 16, 2021

STAFF GUIDANCE

Guidance Title: Use of Nitrate + Nitrite (total) Analysis for Compliance Determinations with Nitrate Maximum Contaminant Level
Rule Affected: 40 CFR 141.23

Background: According to 40 CFR 141.23, all public water systems (PWSs) are required to monitor at least annually to determine compliance with the Nitrate MCL of 10 mg/L listed in 40 CFR §141.62. As the primacy agency the NMED Drinking Water Bureau allows for the use of Nitrate + Nitrite (total) results to be used for compliance with the Nitrate MCL. The exception to this requirement is certain consecutive systems treated as a single system for monitoring purposes as allowed by 40 CFR 141.29

Guidance:

Sample Collection
The NMED Drinking Water Bureau (DWB) sampling team collects Nitrate + Nitrite (total) samples for all PWSs that are not owned or operated by a Federal Agency on an annual basis. Samples being analyzed for Nitrate + Nitrite (total) must be preserved with sulfuric acid in the field at the time of collection, transported on ice, stored at a temperature of ≤ 4°C, and be analyzed within 28 days* [40 CFR §141.23(k)(2)].

If a sample result is ≥ 5 mg/L (½ the MCL) according to a Nitrate + Nitrite (total) analysis, the PWS's source has shown a potential for Nitrate contamination that may necessitate the PWS be placed on quarterly monitoring. Analysis of a confirmation sample following an exceedance of ≥ 5 mg/L using a Nitrate + Nitrite (total) analysis will be conducted using a Nitrate **only** method of analysis as specified in 40 CFR 141.23(k), table item 18, rather than a Nitrate + Nitrite (total) method.

Upon receiving notice that a PWS has exceeded a concentration of ≥ 5 mg/L for Nitrate + Nitrite (total), compliance staff will communicate with the appropriate NMED DWB sampler that a confirmation sample is required. Compliance staff may contact DWB sampler upon receipt of preliminary lab results, indicating a concentration greater than half of the MCL. Confirmation samples must be collected within 24 hours after receipt of the laboratory analytical report showing an MCL exceedance for the first sample. If the NMED DWB sampler is unable to collect the sample within 24 hours the PWS will be notified that they are responsible to take the confirmation sample.

Confirmation samples must be transported on ice, stored at a temperature of ≤ 4°C, and be analyzed within 48 hours if the PWS is non-chlorinated; 14 days if chlorinated. There is no chemical preservation added to the sample.

	Nitrate + Nitrite (total)	Nitrate (chlorinated)	Nitrate (non-chlorinated)
Preservation	H_2SO_4 to pH < 2	None	None
Temperature	≤ 4°C (do not freeze)	≤ 4°C (do not freeze)	≤ 4°C (do not freeze)
Container	Plastic or Glass	Plastic or Glass	Plastic or Glass
Hold Time	28 days*	14 days	48 hours
Method	EPA 300.0 or EPA 353.2	EPA 300.0 or EPA 353.2	EPA 300.0 or EPA 353.2
SDWIS code	1038	1040	1040

*Samples used to demonstrate compliance, especially for acute contaminants, should be analyzed as soon after collection as possible.

Compliance Action and Public Notification
Systems unable to comply with the 24-hour sampling requirement after exceeding a concentration of 5 mg/L must immediately notify persons served by the PWS in accordance with §141.202 to meet Tier 1 public notification requirements. Systems exercising this option must collect a confirmation sample within two weeks of notification of the analytical results of the first sample.

Exceedance of either the Nitrate MCL or Nitrate + Nitrite (total) MCL (10 mg/L) requires a Tier 1 public notification, also requiring the PWS to notify consumers within 24 hours after the PWS learns about the violation [40 CFR §141.202].

Community water systems: samples analyzed using a Nitrate + Nitrite (total) analysis must report results in their Consumer Confidence Reports' detected contaminant table and, applicable information for MCL violations [40 CFR §141.153]. Systems which detect Nitrate + Nitrite (total) and Nitrite at levels above 5 mg/L, but equal to or below the MCL, must also provide additional health information in their Consumer Confidence Report to ensure that the public is informed of possible risks to infants from drinking water containing elevated concentrations of nitrate [40 CFR §141.154(c)].

Increased Monitoring
If any one sample has a concentration ≥ 5 mg/L, a Community or NTNC water systems will be placed on a quarterly schedule for a minimum of one year. Specifically:

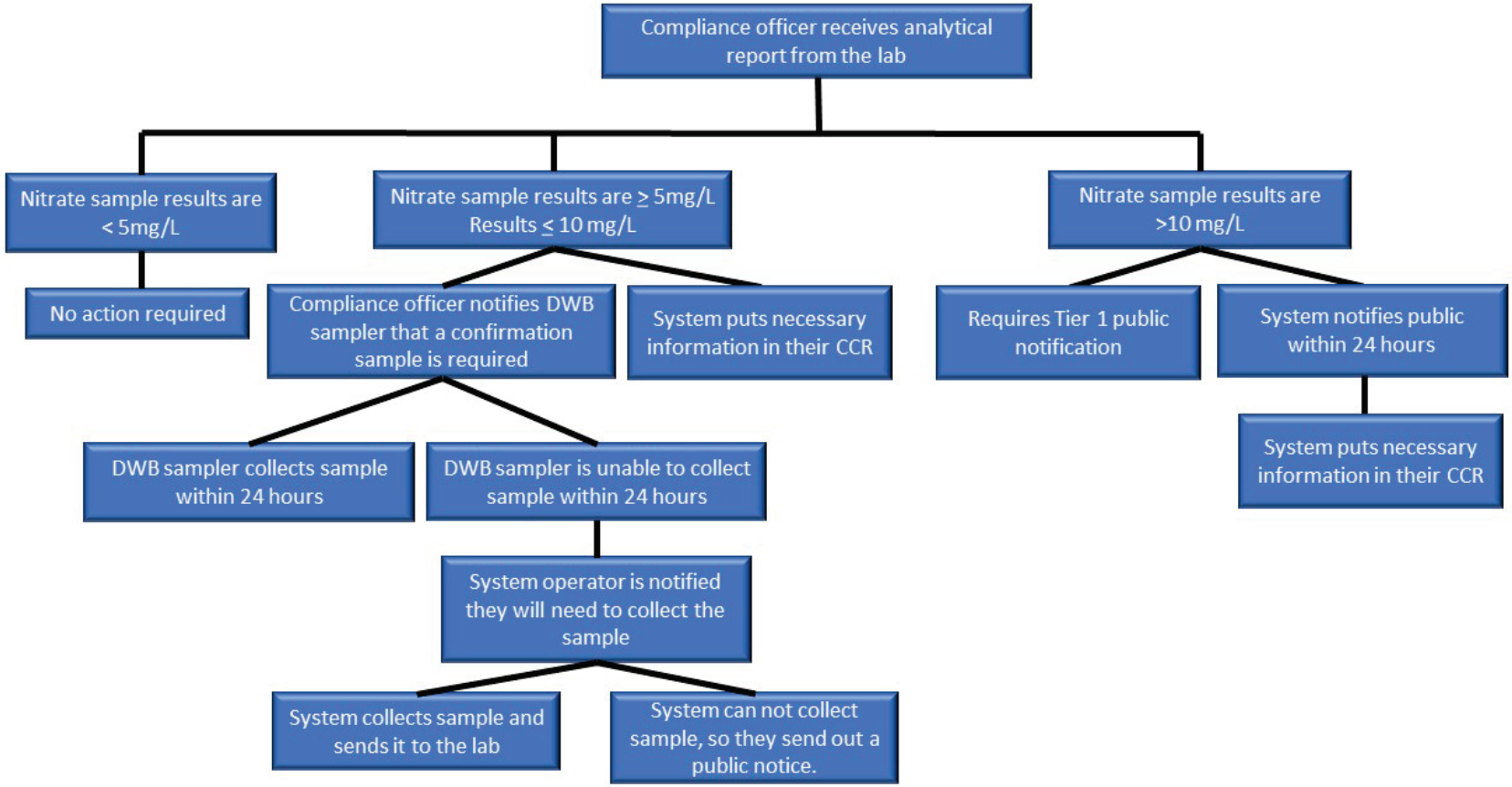
- The sample schedule will begin in the quarter following the ≥ ½ MCL result.
- A groundwater system may have the sampling frequency reduced to annually after four consecutive quarterly samples are reliably and consistently less than the MCL [40 CFR §141.23(d)(2)]. This includes samples for systems that are reliably and consistently between the ≥ ½ MCL and the MCL.
- A surface water system may have the sampling frequency reduced to annually if all analytical results from four consecutive quarters are < ½ of the MCL. A surface water system shall return to quarterly monitoring if any one sample is ≥ ½ of the MCL [40 CFR §141.23(d)(3)].

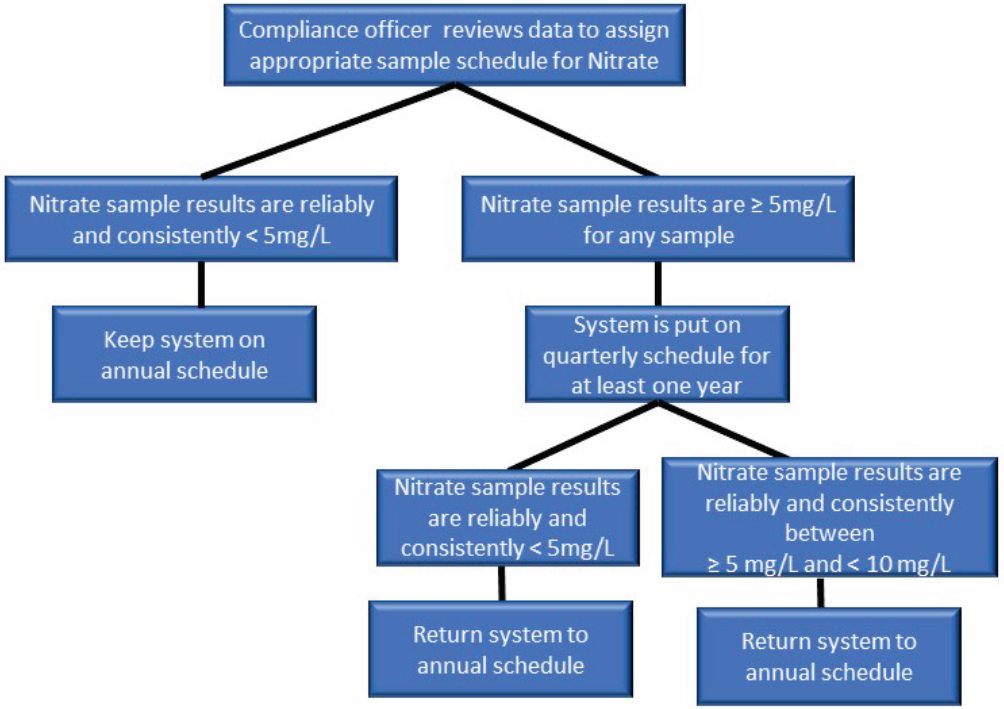
Approved by:

PWSS Manager

Approved by:

Water Conservation Fund Manager


Compliance officer receives analytical report from the lab
Nitrate sample results are < 5mg/L
Nitrate sample results are ≥ 5mg/L Results ≤ 10 mg/L
Nitrate sample results are >10 mg/L
No action required
Compliance officer notifies DWB sampler that a confirmation sample is required
System puts necessary information in their CCR
Requires Tier 1 public notification
System notifies public within 24 hours
System puts necessary information in their CCR
DWB sampler collects sample within 24 hours
DWB sampler is unable to collect sample within 24 hours
System operator is notified they will need to collect the sample
System collects sample and sends it to the lab
System can not collect sample, so they send out a public notice.


Compliance officer reviews data to assign appropriate sample schedule for Nitrate
Nitrate sample results are reliably and consistently < 5mg/L
Nitrate sample results are ≥ 5mg/L for any sample
Keep system on annual schedule
System is put on quarterly schedule for at least one year
Nitrate sample results are reliably and consistently < 5mg/L
Nitrate sample results are reliably and consistently between ≥ 5 mg/L and < 10 mg/L
Return system to annual schedule
Return system to annual schedule

APPENDIX D.

MAXIMUM CONTAMINAT LEVELS FOR REGULATED CONTAMINATS

Maximum Contaminant Levels for Regulated Contaminants

Microbiological Standards

Contaminant	Maximum Contaminant Level or Required Treatment Technique
Cryptosporidium	Disinfect and filter (or meet criteria to avoid filtration); Unfiltered systems are required to include *Cryptosporidium* in their existing watershed control provisions
Giardia lamblia	Disinfect and filter (or meet criteria to avoid filtration) to remove/inactivate 99.9% *Giardia lamblia*
Heterotrophic Plate Count	Disinfect and filter (or meet criteria to avoid filtration) so that there are no more than 500 bacterial colonies per millimeter
Legionella	Disinfect and filter (or meet criteria to avoid filtration)
Total Coliforms (including fecal coliform and *E. Coli*)	Disinfect and filter (or meet criteria to avoid filtration) so that no more than 5% of the samples of total coliform test positive in a month
Turbidity	Disinfect and filter (or meet criteria to avoid filtration); Systems that use conventional or direct filtration, at no time can turbidity (cloudiness of water) go higher than 1 nephelometric turbidity unit NTU), and samples for turbidity must be less than or equal to 0.3 NTU in at least 95 percent of the samples in any month. Systems that use filtration other than the conventional or direct filtration must follow state limits, which must include turbidity at no time exceeding 1 NTU.
Viruses (enteric)	Disinfect and filter (or meet criteria to avoid filtration)

Disinfection and Disinfection Byproduct Standards

Disinfection			
Disinfection ByProducts		***Disinfectants***	
Contaminant	**MCL (mg/L)**	**Contaminant**	**MRDL (mg/L)**
Bromate	0.010	Chloramines (as Cl_2)	4.0
Chlorite	1.0	Chlorine (as Cl_2)	4.0
Haloacetic acids (HAA5)	0.060	Chlorine Dioxide (as ClO_2)	0.8
Total Trihalomethanes (TTHMs)	0.80		

Inorganic Chemical Standards

Inorganic Chemicals			
Contaminant	**MCL (mg/L unless otherwise indicated)**	**Contaminant**	**MCL (mg/L unless otherwise indicated)**
Antimony	0.006	Cyanide (as free cyanide)	0.2
Arsenic	0.010	Fluoride	4.0
Asbestos (fiber >10 micrometers)	7 million fibers/L	Lead*	Action Level = 0.015
Barium	2	Mercury (inorganic)	0.002
Beryllium	0.004	Nitrate (measured as Nitrogen)	10
Cadmium	0.005	Nitrite (measured as Nitrogen)	1
Chromium (total)	0.1	Selenium	0.05
Copper*	Action Level = 1.3	Thallium	0.002

* Lead and Copper are regulated by a TT that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps.

Maximum Contaminant Levels for Regulated Contaminants

Organic Chemical Standards

Organic Chemicals			
Contaminant	**MCL (mg/L) or TT**	**Contaminant**	**MCL (mg/L) or TT**
Acrylamide	TT** 0.05% dosed at 1 mg/L	Epichlorohydrin	TT** 0.01% dosed at 20 mg/L
Alachlor	0.002	Ethylbenzene	0.7
Atrazine	0.003	Ethylene dibromide	0.00005
Benzene	0.005	Glyphosate	0.7
Benzo(a)pyrene (PAHs)	0.0002	Heptachlor	0.004
Carbofuran	0.04	Heptachlor epoxide	0.0002
Carbon tetrachloride	0.005	Hexachlorobenzene	0.001
Chlordane	0.002	Hexachlorocyclopentadiene	0.05
Chlorobenzene	0.1	Lindane	0.0002
2,4-D	0.07	Methoxychlor	0.04
Dalapon	0.2	Oxamyl (Vydate)	0.2
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	Polychlorinated biphenyls (PCBs)	0.0005
o-Dichlorobenzene	0.6	Pentachlorophenol	0.001
p-Dichlorobenzene	0.075	Picloram	0.5
1,2-Dichloroethane	0.005	Simazine	0.004
1,1-Dichloroethylene	0.007	Styrene	0.1
cis-1,2-Dichloroethylene	0.07	Tetrachloroethylene	0.005
Trans-1,2-Dichloroethylene	0.1	Toluene	1
Dichloromethane	0.005	Toxaphene	0.003
1,2-Dichloropropane	0.005	2,4,5-TP (Silvex)	0.05
Di(2-ethylhexyl)adipate	0.4	1,2,4-Trichlorobenzene	0.07
Di(2-ethylhexyl)phthalate	0.006	1,1,1-Trichloroethane	0.2
Dinoseb	0.007	1,1,2-Trichloroethane	0.005
Dioxin (2,3,7,8-TCDD)	0.0000003	Trichloroethylene	0.0005
Diquat	0.02	Vinyl Chloride	0.002
Endothall	0.1	Xylenes (total)	10
Endrin	0.002		

**Each water system must certify, in writing, to the state (using third-party or manufacturer's certification) that when acrylamide and epichlorohydrin are used to treat water, the combination (or product) of dose and monomer level does not exceed the levels specified.

Radionuclide Standards

Radionuclides	
Contaminant	**Standard**
Alpha particles	15 picocuries per L (pCi/L)
Beta particles and photon emitters	4 millirems per year
Radium 226 and Radium 228 (combined)	5 pCi/L
Uranium	30 µg/L

APPENDIX E.

ANALYTICAL METHODS, SAMPLE CONTAINERS, REGEANTS, AND HOLD TIMES

Methods, Sample Containers, Reagents, and Hold Times

Sample Type	Method	Container	Dechlorination agent	Preservative	Hold time for sampler	Hold time per method (lab)
INORGANICS						
Anions						
Chloride	300.0	1-500 mL P	n/a	cool, ≤ 4°C	n/a	28 days
Fluoride	300.0	1-100 mL P	n/a	cool, ≤ 4°C	n/a	28 days
Nitrite	300.0	1-100 mL P	n/a	cool, ≤ 4°C	submit immediately after sampling	48 hours
Nitrate-Nitrite	300.0/353.2	1-100 mL P	n/a	H_2SO_4, pH ≤ 2 (8-10 drops); cool, ≤ 4°C		28 days
Sulfate	300.0	1-500 mL P	n/a	cool, ≤ 4°C	n/a	28 days
Color	SM 2120 B	1-500 mL P	n/a	cool, ≤ 4°C	submit immediately after sampling	48 hours
Cyanide	335.4	1-500 mL P	0.6 g ascorbic acid	8-12 pellets NaOH, pH ≥12	n/a	14 days
[1, 2,3] Heavy Metals						
Aluminum	200.7/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH ≤ 2; cool, ≤ 4°C	n/a	6 months
Arsenic	200.8	1-500 mL P	n/a	5 mL-HNO_3, pH ≤ 2; cool, ≤ 4°C	n/a	6 months
Antimony	200.8	1-500 mL P	n/a	5 mL-HNO_3, pH ≤ 2; cool, ≤ 4°C	n/a	6 months
Barium	200.7/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH ≤ 2; cool, ≤ 4°C	n/a	6 months
Beryllium	200.7/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH ≤ 2; cool, ≤ 4°C	n/a	6 months
Cadmium	200.7/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH ≤ 2; cool, ≤ 4°C	n/a	6 months
Copper	200.7/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH ≤ 2; cool, ≤ 4°C	n/a	6 months
Chromium	200.7/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH ≤ 2; cool, ≤ 4°C	n/a	6 months
Iron	200.7	1-500 mL P	n/a	5 mL-HNO_3, pH ≤ 2; cool, ≤ 4°C	n/a	6 months

Sample Type	Method	Container	Dechlorination agent	Preservative	Hold time for sampler	Hold time per method (lab)
Lead	200.8	1-500 mL P	n/a	5 mL-HNO_3, pH $\leq$ 2; cool, $\leq$ 4°C	n/a	6 months
Manganese	200.7/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH $\leq$ 2; cool, $\leq$ 4°C	n/a	6 months
Mercury	245.1/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH $\leq$ 2; cool, $\leq$ 4°C	n/a	28 days
Nickel	200.7/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH $\leq$ 2; cool, $\leq$ 4°C	n/a	6 months
Selenium	200.8/200.9	1-500 mL P	n/a	5 mL-HNO_3, pH $\leq$ 2; cool, $\leq$ 4°C	n/a	6 months
Silver	200.7/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH $\leq$ 2; cool, $\leq$ 4°C	n/a	6 months
Sodium	200.7	1-500 mL P	n/a	5 mL-HNO_3, pH $\leq$ 2; cool, $\leq$ 4°C	n/a	6 months
Thallium	200.8	1-500 mL P	n/a	5 mL-HNO_3, pH $\leq$ 2; cool, $\leq$ 4°C	n/a	6 months
Zinc	200.7/200.8	1-500 mL P	n/a	5 mL-HNO_3, pH $\leq$ 2; cool, $\leq$ 4°C	n/a	6 months
Odor	SM 2150 B	1-500 mL P	n/a	cool, $\leq$ 4°C	submit immediately after sampling	24 hours
pH	SM 4500 H+B	1-500 mL P	n/a	n/a	analyze immediately	analyze immediately
Surfactants	SM 5540C	1-500 mL P	n/a	cool, $\leq$ 4°C	submit immediately after sampling	48 hours
TDS	SM 2540C	1-500 mL P	n/a	cool, $\leq$ 4°C	submit immediately after sampling	7 days
ORGANICS						
[4,5] VOC I	524.2	2-40 mL clear glass vials	ascorbic acid	2 drops-HCl	72 hours	14 days from time of sampling
[4,5] VOC II	504.1	2-40 mL clear glass vials	$Na_2S_2O_3$	n/a	72 hours	Must be extracted AND analyzed within 14 days

Sample Type	Method	Container	Dechlorination agent	Preservative	Hold time for sampler	Hold time per method (lab)
SOC, PCB, Chlorodane, Toxaphene	525.2/508.1	2-1000 mL amber glass bottles	Na_2SO_3	2 ml-HCl	72 hours	14 days to extract, 30 days to analyze after extraction
Acid Herbicides	515.4	1-250 mL amber glass bottle	Na_2SO_3	n/a	72 hours	14 days to extract, 21 days to analyze after extraction
Carbamates	531.2	1-40 mL amber glass vial	$Na_2S_2O_3$	n/a	72 hours	28 days from time of sampling
Glyphosate	547	1-40 mL amber glass vial	$Na_2S_2O_3$	n/a	72 hours	14 days from time of sampling
Endothall	548.1	1-250 mL amber glass bottle	$Na_2S_2O_3$	n/a	72 hours	7 days to extract, 14 days to analyze after extraction
Diquat	549.2	1-1000 mL dark polyethylene bottle	$Na_2S_2O_3$	n/a	72 hours	7 days to extract, 21 days to analyze after extraction
DISINFECTION BY-PRODUCTS						
Haloacetic Acids	552.2	2-65 mL amber glass vials	n/a	NH_4Cl; cool, -10°C, dark	72 hours	14 days from time of sampling
[5]Total trihalomethanes	524.2	2-40 mL clear glass vials	$Na_2S_2O_3$	cool, $\leq$ 4°C	72 hours	14 days from time of sampling
RADIOLOGICAL[6, 7]						
[8]Uranium, mass concentration	200.8	1-500 mL P	n/a	5 mL-HNO_3, pH $\leq$ 2; cool, $\leq$ 4°C	n/a	6 months
Gross alpha/gross beta	SM 7110 B	2-1 gal P	n/a	HNO_3, pH $\leq$ 2	n/a	6 months
Radium 226	903.1	2-1 gal P	n/a	HNO_3, pH $\leq$ 2	n/a	6 months
Radium 228	904.0	2-1 gal P	n/a	HNO_3, pH $\leq$ 2	n/a	6 months

Sample Type	Method	Container	Dechlorination agent	Preservative	Hold time for sampler	Hold time per method (lab)
MICROBIOLOGICAL						
Total coliform (P/A)	SM 9223 B MMO-MUG	sterile 120 mL P	$Na_2S_2O_3$	n/a	24 hours	30 hours
E. coli	SM 9223 B-QT MMO-MUG MPN/100 mL	sterile 120 mL P	$Na_2S_2O_3$	n/a	submit immediately after sampling	6 hours

[1]Metals (with the exception of Hg) have a 6 month hold time from sampling assuming the sample is acidified within 2 weeks.

2Pb and Cu must be taken as "first draw" and is collected in a 1 L cubitainer.

[3]Sodium is not on the primary contaminant list and has its own monitoring rule which follows the same schedule as primary list metals.

[4]A set of travel blanks must accompany all VOC I and VOC II samples and have a hold time of 30 days from time of preparation.

[5]Must be collected with zero headspace.

[6]When requesting the full radiological package (NRAD) 2-1 gal P are collected.

[7]When collecting the 4 quarterly samples for a radiological composite approximately 15 mL of HNO_3 should be added throughout the collection process, to $\leq$ 2 pH.

[8]If U is determined by mass, a 0.67 pCi/ug conversion factor must be used. This is based on 1:1 activity ratio of U-234 and U-238, characteristic of naturally occuring uranium.