QUALITY ASSURANCE PROJECT PLAN
FOR
WATER QUALITY MANAGEMENT PROGRAMS

2024

Surface Water Quality Bureau
New Mexico Environment Department

Approved: November 12, 2024

New Mexico Environment Department/Surface Water Quality Bureau (NMED/SWQB). 2024. *Quality Assurance Project Plan for Water Quality Management Programs [QAPP]*.

Clean Water Act Section 106 Grant # I-00635023
Effective Date: Five years from date of final approval

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APPROVAL PAGE

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GROUP A. PROJECT MANAGEMENT AND INFORMATION/DATA QUALITY OBJECTIVES

A1. Title Page

See page i.

A2. Approval Page

See page ii.

A3. Table of Contents, Document Format, and Document Control

List of Figures

List of Tables

Abbreviations and Acronyms

ASTM	American Society for Testing and Materials
ATTAINS	Assessment, Total Maximum Daily Load Tracking and Implementation System
BMP	Best Management Practices
CALM	Comprehensive Assessment and Listing Methodology
CFR	Code of Federal Regulations
CWA	Clean Water Act
DO	Dissolved Oxygen
DQI	Data Quality Indicator
DQO	Data Quality Objectives
FSP	Field Sampling Plan
E. coli	Escherichia coli
HAB	Harmful Algal Bloom
GRTS	Grant Reporting and Tracking System
ID	Identification
IR	Integrated Report and List
MASS	Monitoring Assessment and Standards Section
MDL	Method Detection Limit
MRL	Method Reporting Level
MQO	Measurement Quality Objectives
MST	Microbial Source Tracking
NM	New Mexico
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes Annotated
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
PSRS	Point Source Regulation Section
QA	Quality Assurance
QAA	Quality Assurance Audit
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QC	Quality Control
QMP	Quality Management Plan
RID	Request Identification
SAP	Sampling and Analysis Plan
SDL	Sample Detection Limit
SLD	Scientific Laboratory Division
SQUID	New Mexico’s Surface Water Quality Information Database
SOP	Standard Operating Procedure
SPRT	Standards, Planning and Reporting Team
STORET	Storage and Retrieval System
SWQB	Surface Water Quality Bureau
TMDL	Total Maximum Daily Load
UAA	Use Attainability Analysis

EPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WAP	Wetland Action Plan
WBP	Watershed Based Plan
WDAS	EPA Water Division, Assistance Programs Branch, State and Tribal Programs Section
WPS	Watershed Protection Section
WQA	Water Quality Act
WQS	Water Quality Standards
WQCC	Water Quality Control Commission
WQMP/CPP	Water Quality Management Plan/Continuing Planning Process
WQX	Water Quality Exchange

This document was prepared in accordance with U.S. Environmental Protection Agency (EPA) Guidance for Quality Assurance Project Plans (EPA QA/G-5) and the Quality Assurance Project Plan Standard (EPA CIO 2105-S-02.1).

A4. Project Purpose, Problem Definition, and Background

PROJECT PURPOSE AND PROBLEM DEFINITION

The purpose of this QAPP is to describe how the SWQB's environmental information operations are planned, implemented, documented, and assessed. This QAPP describes in comprehensive detail the necessary Quality Assurance (QA) and Quality Control (QC) requirements and other technical activities that must be implemented to ensure that the results of the environmental information operations performed will satisfy the stated performance and acceptance criteria. This QAPP is supported by the SWQB Quality Management Plan (QMP). If any environmental data operations funded directly or indirectly through the EPA fall outside this QAPP, an EPA-approved project-specific QAPP will be required.

Due to the dynamic nature of natural systems, the integrity or condition of New Mexico's (NM) surface waters may not always be known due to a lack of information or because of changing conditions. For example, the location of degraded waters and/or the level of degradation or contamination may not be known or may change as a result of human activities or natural occurrences (e.g., floods, droughts, wildfires, etc.). In other cases, standards for evaluating the condition of surface waters may change.

To address these problems, the SWQB collects chemical, physical, biological, and continuous data to evaluate the condition of the State's surface waters, determine where degraded waters occur, and gauge the effectiveness of restoration projects and permit limits and conditions. Tables 1 and 2 in section A5 thoroughly detail monitoring types, strategies, objectives, and products/outcomes for all environmental information collected by the SWQB.

BACKGROUND AND REGULATORY PROGRAMS AND STANDARDS

Section 101(a) of the federal Clean Water Act (CWA) states that, "The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The State of New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4 New Mexico Administrative Code (NMAC)) restates the objective of the CWA and goes on to say that the waters include, "those in New Mexico." In conformance with the CWA §§104(b), 106, 201, 205(j), 301(b), 303, 304(a), 305(b), 314, 319(h), 401(a), 404, and 604(b), the NM Water Quality Act (WQA; §§ 74-6-1 et seq., New Mexico Statues Annotated (NMSA) 1978) and 20.6.4 NMAC, SWQB data collection efforts generate and provide information to the public, NMED, and EPA that can be used to restore and maintain the integrity of NM's surface waters. As such, the SWQB receives CWA grants to conduct water quality monitoring to achieve this goal.

A5. Project Task Description

The SWQB collects, analyzes, and uses data from waters of the State on a structured, rotating basis to identify where water quality problems exist, prioritize protection and restoration projects, guide National Pollutant Discharge Elimination System (NPDES) permitting, and inform potential Water Quality Standards (WQS) revisions. Data acquisition types, objectives and application, general data collection frequency and schedule, and Team lead for data acquisition types are described in Table 1. Decision criteria and products and outcomes for SWQB objectives are described in Table 2.

Table 1. SWQB Environmental Monitoring Types and Strategy Details

Data Acquisition Type	Objectives and Application	Frequency and Schedule	Team Lead for Data Acquisition Type
NPDES Permit Compliance Inspections	The PSRS assists the EPA with the implementation of the NPDES program by conducting inspections that help address water pollution by regulating point sources that discharge pollutants into the waters of New Mexico. NPDES Inspections performed include but are not limited to, Compliance Evaluation, Offside Compliance, Compliance Sampling, Performance Audit, Reconnaissance, Off-Site Desk Audit, Compliance Biomonitoring, Toxics Sampling, Diagnostic, Pretreatment Compliance, Focused Compliance, Follow-Up, Sewage Sludge/Biosolids, Sanitary Sewer Overflow, Stormwater Inspection, Municipal Separate Storm Sewer System, Municipal Separate Storm Sewer System, Concentrated Animal Feeding Operation. See Appendix A for descriptions of each Inspection type.	Year-round as needed	Permit and Certification Team Compliance and Enforcement Team
Antidegradation Analysis	Effluent collected by NPDES existing, or proposed permittees and ambient stream data collected by proposed or current NPDES permitees or MASS may be used to calculate the degradation of receiving streams.	As needed for new facility, discharges, changes in existing facility discharge design flows or outfall locations, or changes in WQS	Permit and Certification Team
Ambient Surface Water Quality Monitoring	Physical, chemical, biological and continuous data collected for Ambient Surface Water Quality Monitoring may be used to 1) evaluate known or suspected influences on water quality (both natural and anthropogenic), 2) identify the condition of unassessed waterbodies, 3) provide information for Total Maximum Daily Loads (TMDL or TMDL alternatives), standards development or revision, Use Attainability Analysis (UAA), development or revision of listing methodologies, 4) assess against the State's WQS in development of the Integrated Report and List (IR), 5) develop and maintain Fish Consumption Advisories, and/or 6) determine potential harmful algal blooms (HABs). • Targeted Monitoring - Collection and evaluation of physical, chemical, biological, and continuous parameters from specified locations. • Fixed-Station Monitoring - The repeated long-term sampling or measurement of physical, chemical, biological, and continuous water quality parameters at representative locations to determine the waterbody's characteristics and temporal trends. Fixed-station monitoring may be done over a specified location for a particular period of time.	Routine monitoring is conducted on a rotational basin schedule as described in SWQB's 10-Year Monitoring and Assessment Strategy (NMED/SWQB 2016 or most current version) and survey Field Sampling Plans (FSPs).	Monitoring Team*
	• Probabilistic Monitoring – Unbiased statistical survey of waterbodies to determine general water quality condition at a specified scale. Data collection may include physical, chemical, and/or biological parameters.	Probabilistic monitoring is temporally and spatially based by the intent of the survey and the question(s) the survey is designed to address.	Monitoring Team*
Monitoring for Enforcement Purposes	Collection and evaluation of environmental data from sites selected based upon known or suspected influences on water quality (both natural and anthropogenic) to determine whether pollutant concentrations in a waterbody are in compliance with the limits and conditions specified in the State of NM Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC). This type of monitoring is similar to Targeted Monitoring with modified procedures pertaining to number of samples collected and chain of custody requirements for the purposes of considering enforcement action.	Year-round, as needed	Monitoring Team* Compliance and Enforcement Team
Incident Response Monitoring	Monitoring conducted in response to a known or suspected unpermitted release, discharge or spill to a surface water body. Also includes monitoring conducted in response to an unpermitted release, discharge, or spill to a surface water body as reported as part of sanitary sewer overflow, 7-day release, 15-day release, and final release reports. The information is used to determine the	Year-round, as needed	All Teams

Data Acquisition Type	Objectives and Application	Frequency and Schedule	Team Lead for Data Acquisition Type
	magnitude, extent and severity of impact to designated or existing uses. Monitoring may continue, as needed, to inform incident and recovery management, and requirement of corrective actions.		
Hydrology Protocol Survey	The collection and evaluation of hydrological, geomorphic, and biological indicators of the persistence of water as described in Appendix C of the Water Quality Management Plan / Continuing Planning Process. Hydrology Protocol surveys may also be used, for example, to determine the appropriate application of WQS and confirm WQS classification.	Late Spring and Fall, outside of summer monsoons and winter precipitation and snowmelt	Standards Planning & Reporting Team** Monitoring Team*
SWQB Watershed Protection Projects	The SWQB's collection and evaluation of biological, chemical, and physical (including geologic, streamflow, soils and vegetation) data to evaluate watershed conditions to develop watershed-based plans, alternative watershed-based plans, wetlands action plans, determine and partition potential sources of impairment, complete condition assessments of wetlands, and potential use for assessment against the State's WQS.	Spring to Fall, yearly (March-November)	Implementation & Restoration Team and NM Field Office Team Effectiveness Monitoring Team Wetlands Team
Effectiveness Monitoring	Collection and evaluation of environmental data to monitor and model changes in physical, chemical, biological, and continuous data associated with nonpoint source (NPS) pollution control projects for the purpose of assessing the projects overall effectiveness in reducing NPS and improving water quality. Data collected for this purpose may also have potential use for assessment against the State's WQS.	Spring to Fall, yearly (March-November)	Effectiveness Monitoring Team***
Independent Studies	Collection and evaluation of environmental data (direct and indirect) to monitor and/or model various independent studies pertaining to the goals and objectives of the SWQB.	Dependent on scope of work and goals of study	All Teams
Existing Information	Also known as secondary data or existing data, environmental and supporting data obtained from existing data sources or not directly measured or generated by the SWQB used for project implementation or decision making.	Year-round, as needed	All Teams
Modeling[1]	Modeling conducted by the SWQB using environmental data from either existing information or direct measurement that produce a product that aids in environmental decision making.	Year-round, as needed	All Teams

*Includes SWQB personnel from other Teams that are accompanied or trained by an experienced Monitoring Team member, Monitoring Team Supervisor or the MASS Program Manager. An experienced Monitoring Team member is detailed in the SWQB QAPP and applicable SOPs. Generally, for the Monitoring Team experienced is at least one year of field data collection or until such a time that the MASS Program Manager or Monitoring Team Supervisor determines that the individual can carry out data collection activities in accordance with this QAPP and applicable SOPs.
** Includes MASS Program Manager and SWQB personnel from other Teams that are trained by either the MASS Program Manager or the SPRT Supervisor.
***Includes personnel from the Watershed Protection Section that have signed applicable SOPs for data collection.

[1] The EPA Quality Policy defined in EPA Directive No: Chief Information Officer Environmental Information Quality Policy (CIO 2105.4) was designed and structured for the collection and use of Environmental Information. Because modeling can also produce data that will be used in decision making, quality issues are also relevant for these data (modeling inputs and outputs). Quality assurance of input data and parameter values are important to model quality. Because the input data are likely obtained from other existing information, data quality procedures for existing information should be followed when utilizing such data. See the following link: https://www.epa.gov/quality/guidance-quality-assurance-project-plans-modeling-epa-qag-5m

Table 2. SWQB Environmental Monitoring Summary for Waterbodies Sampled

Objective	Question or Decision	Decision Criteria	Products/Outcomes
Assess designated use attainment for the Integrated Report and provide information to the public on the condition of surface water	Surface waters of the state are meeting WQS criteria?	Applicable WQS attainment as determined by application of the Assessment Protocols	303(d)/305(b) Integrated Report and List
Determine whether ambient monitoring activities meet the programmatic needs of the SWQB.	Did the survey meet the objectives of the approved FSP or Sampling and Analysis Plan (SAP)?	Description of monitoring locations and activities in the FSP or SAP	Monitoring Survey Reports Fish Consumption Advisories HABs Advisories
Develop NPDES permit limits	What are the maximum concentrations of pollutants that can be discharged and meet the requirements of the WQS?	WQS and receiving water assimilative capacity	401 Certification NPDES Permit Limits
Determine if an unauthorized discharge impacted water quality	Did an unauthorized discharge cause a violation of the WQS?	WQS or immediate threat to human health	Compliance and Enforcement Actions (Compliance Order or Civil Action)
Evaluate compliance with NPDES permit limits	Does the effluent quality meet the NPDES permit requirements?	NPDES permit limits	Inspection Reports Compliance and Enforcement Action
Develop load and waste load allocations for TMDLs	What is the maximum pollutant load a waterbody can receive and meet the requirements of the WQS?	WQS and receiving water assimilative capacity	TMDL Plans TMDL alternatives NPDES Permit Limits
Develop or refine WQS	Are current assigned designated uses appropriate for the waterbody?	Data support a petition to the Water Quality Control Commission (WQCC) to revise WQS	UAA Workplans UAAs (including those using the Hydrology Protocol) Amendments to NM WQS
Develop wetlands standards	What are the appropriate criteria for wetlands?	Data support a petition to the WQCC to incorporate wetland specific WQS	Amendments to NM WQS
Determine probable sources and NPS mitigation measures	What are the probable sources of impairment and what are the potential mitigation measures to control nonpoint sources?	Best Management Practices (BMPs)	Watershed-Based Plan Alternative Watershed-Based Plan Watershed Restoration Action Strategies Wetland Action Plan
Evaluate effectiveness of restoration and mitigation measures implemented to control nonpoint sources	Have watershed restoration activities and mitigation measures improved water quality?	Applicable WQS attainment as determined by application of Data show improved water quality	Project Summary Reports Success Stories NPS Annual Report 303(d)/305(b) Integrated Report and List
Respond to citizen complaints, fish kills, spills and emergencies	Is the water or effluent quality a hazard to human or environmental health?	WQS, data and site investigation	Public communication Compliance and Enforcement Actions HABs Advisories
General education and public outreach	Is the general public being informed on SWQB water quality issues	Information is disseminated to the public through the product outcomes	White paper Special Reports Clearing the Waters newsletter Monitoring Survey Report Integrated Report

A6. Information/Data Quality Objectives and Performance/Acceptance Criteria

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

- consistent with the mission, goals, and objectives of the NMED and SWQB
- based on proper application of federal and state regulations, policy, and guidance
- based on all available, accurate information
- based on a thorough understanding of the information pertinent to objectives

Data Quality Objectives (DQOs) are qualitative and quantitative statements that help ensure the right data are collected to make a decision within confidence constraints. For data collected under this QAPP to support the decisions listed in Table 2, the Data Quality Indicators (DQIs) identified in Table 3 must be of sufficient quality to provide a high level of confidence in the resulting decisions.

Measurement Quality Objectives (MQOs) are statements about how good the measurements must be to be useful decision process inputs. MQOs are often expressed as statements about the acceptable values for DQIs and include measures such as percent recovery, percent relative standard deviation, and minimum detection limit (MDL). Acceptable values for analytical DQI are provided in Appendix B: Analytical Methods and Detection Limits, and in the procedures identified in SWQB Standard Operating Procedure (SOP) 15.0 Verification and Validation Procedures. For more information regarding the DQIs for individual parameters, see the referenced analytical method for chemical analytes and the relevant SOP for physical, chemical, biological, and continuous monitoring.

Table 3. Data Quality Indicators

DQI	Description of DQI
Precision	The degree of variation in repeated measurements of the same quantity of a parameter are minimized by assuring data are collected or collated in a consistent and repeatable manner as described in applicable SWQB SOPs.
Bias	Much of the environmental sampling conducted under this QAPP compares water quality of particular waterbodies on a temporal scale to which the potential systematic bias of a measurement or the process to which it is collected may cause errors in one direction. This is minimized, to the extent possible, by training staff on repeated sampling procedures in accordance with established SOPs and as prescribed in a FSP or other project sample designs, auditing of those processes as needed and documentation through field notes and applicable revisions to SOPs.
Accuracy	The degree of correctness with which a measurement reflects the true value of the parameter being assessed is enhanced through routine calibration practices as prescribed under the applicable SOP and the use of equipment with a range of accuracy within the decision criteria. Acceptable levels of accuracy are specified in the SOPs, are verified through evaluation of routine spiked and field blank sampling, as appropriate.
Representativeness	The measure of the degree to which data accurately and precisely represent variations at a sampling point is assessed through the sample design process and selection of methods based on the question or decision being monitored by considering the spatial and temporal scale of the waterbody being evaluated.

Comparability	Understanding and documenting the extent and magnitude of error in a dataset is important in being able to assess if the dataset is comparable. Documentation of the instruments used, the applicable SOPs used and any field notes along with comparisons to field blanks, spiked samples and duplicate samples will provide the information for a dataset to determine its comparability. Comparability is assessed through the sample design process and selection of methods.
Completeness	To ensure confidence of the dataset for use in the decision it is intended for, the percentage of validated samples collected for a particular dataset from the number that were planned should not be below 90%. This percentage is calculated based on the required number of samples.
Sensitivity	Sensitivity is the ability to discern the detection of a parameter within a sample set from null to meet the decision criteria and is based on the method being used in regard to the sensitivity of the instrument, potential interferences with other parameters, training to collect and analyze the sample, as well as the processes needed to calibrate within an acceptable range.

A7. Distribution List

The SWQB's Quality Assurance Officer (QAO) will provide a copy of the approved QAPP to the EPA Region 6 Project Officer and the SWQB Chief. The QAO will ensure that a copy of the approved QAPP is available on the SWQB webpage.

All individuals (i.e., SWQB personnel, contractors, interns, volunteers, or other NMED staff) working under this QAPP will provide the QAO a written or electronic statement to verify and acknowledge access to the QAPP and responsibility to comply with the requirements of the QAPP. The QAO will be responsible for maintaining electronic copies of all signed acknowledgement statements.

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A8. Project Organization

All project activities covered by this QAPP are performed by NMED SWQB personnel and individuals conducting work for the Bureau (e.g., contractors, interns, volunteers, or other NMED staff). The organization and responsibilities of key individuals are discussed below. The management structure of the NMED-SWQB is shown in Figure 1, while the organizational structure of the various sections and Teams are illustrated in Figure 2. The majority of SWQB personnel have responsibilities that include environmental data collection and analysis.

Quality Assurance Officer (QAO)- The QAO is directly supervised by the Standards, Planning and Reporting Team (SPRT) Supervisor. SPRT members support the QAO as needed. For the purposes of QA, the QAO reports to the SWQB Bureau Chief. The QAO is responsible for updating and maintaining the SWQB QAPP for Water Quality Management Programs and ensuring the QAPP accomplishes the goals of the SWQB QMP.

Program Managers- The SWQB is organized into three (3) technical sections: the Point Source Regulation Section (PSRS), the Monitoring, Assessment, and Standards Section (MASS), and the Watershed Protection Section (WPS). Each section (i.e., PSRS, MASS, and WPS) is led by a Program Manager. Program Managers report to the SWQB Chief and are responsible for verifying that all applicable activities of these sections and teams comply with the provisions of this QAPP and all associated SOPs.

SWQB Personnel- The PSRS, MASS, and WPS staff report to their respective Program Manager. All SWQB personnel within these sections who collect environmental data must do so in accordance with this QAPP. SWQB personnel collecting data are responsible for implementing the methods and procedures described in this QAPP and must be familiar with and follow the provisions of this QAPP.

Project Officer(s)- SWQB personnel who coordinate and manage specific projects report to their respective supervisor and Program Manager and are responsible for verifying that all data collection, storage, and management activities related to the project comply with the provisions of this plan and any applicable SOPs. Project Officer(s) include individuals leading routine water quality monitoring surveys, special water quality projects, NPDES compliance monitoring, CWA §319 monitoring, Effectiveness Monitoring and CWA §104(b)(3) Wetlands Program monitoring.

SWQB Financial and Administrative Section- Does not collect environmental data and does not conduct projects activities that result in the collection, production and/or use of environmental information, metrics or data. The Bureau Financial Manager reports to the Water Protection Division Financial Manager and is responsible for verifying that all applicable activities of these sections and teams comply with the provisions of this QAPP and all associated SOPs.

Non-SWQB Individuals working under this QAPP- On occasion, individuals not directly employed with the SWQB (e.g. contractors, volunteers, interns, other NMED staff) collect environmental data for Bureau use.

Individuals working under the direct supervision of SWQB staff (volunteers and interns) must be familiar with and follow the applicable provisions of this QAPP and associated SOPs. These individuals report and provide data to the SWQB staff they are working directly under.

For those projects in which an individual is working under a contract for the SWQB but does not have a project-specific QAPP, the QAO must provide review and approval of the quality assurances covered under the project's proposed workplan prior to data collection to ensure QA/QC requirements are consistent with the Bureau's QA requirements. These individuals report and provide data to the appropriate Project Officer(s).

Non-SWQB individuals (e.g. contractors and cooperators) may also collect environmental data for the Bureau under a project-specific QAPP. These individuals must provide sufficient QA/QC information to ensure the data meets the Bureau's QA/QC requirements and adhere to the project-specific QAPP along

with any applicable SOPs. These individuals also report and provide data to the appropriate Project Officer(s).

Laboratory Analytical Analyses

Most environmental water chemistry samples collected by the SWQB are analyzed by NM Department of Health Scientific Laboratory Division (SLD) and other contract laboratories. Each analytical laboratory must provide QA/QC information and conform to the specifications and requirements of this QAPP. Each contract laboratory will be required to provide a copy of their QAPP and will report required data to the listed Project Officer based on the procurement documentation.

A9. QAO Independence

The QAO shall be independent of environmental information operations. A full description of the responsibilities of the QAO and how the independence of the QAO is ensured can be found in the SWQB QMP.

A10. Project Organizational Chart and Communications

Figures 1 and 2 describe the management structure of the NMED-SWQB and the organization of the SWQB. The standard communication procedure when addressing concerns regarding data integrity, project discrepancies, or QAPP nonconformances involves the QAO and the Project or Program Manager, although the QAO also has a separate and direct line of communication to the Bureau Chief and the EPA Region 6 Project Officers and Quality Assurance Manager as needed.

Figure 1. Management Structure of the NMED-SWQB

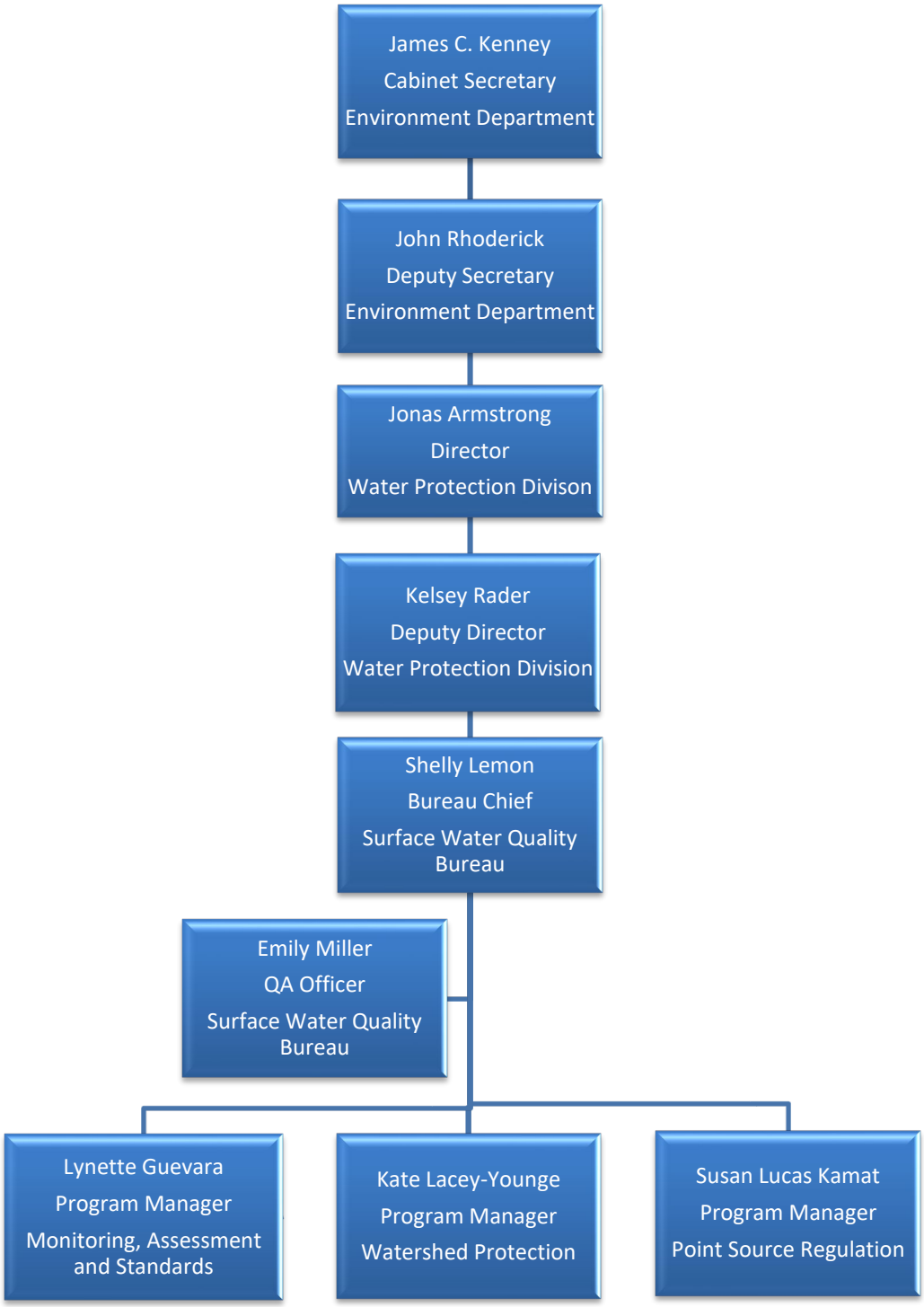
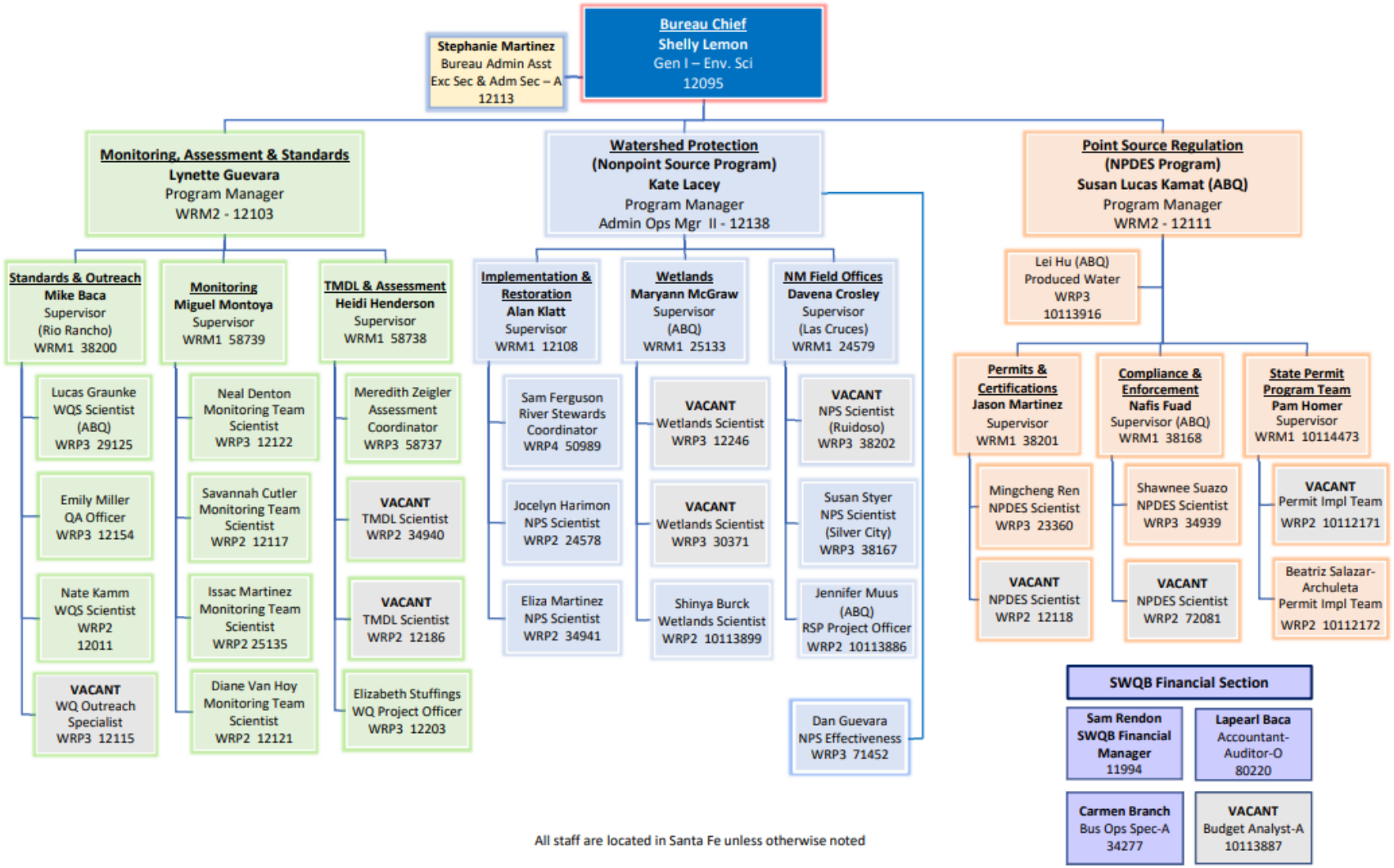


Figure 2. SWQB Organizational Chart



A11. Personnel Training/Certification

Proper training of field personnel represents a critical aspect of meeting the DQOs to fulfill the goals of this QAPP. All SWQB staff that collect environmental data under this QAPP must have sufficient training and experience. Additionally, all non-SWQB individuals (e.g. volunteers or interns) and newly hired SWQB personnel must be accompanied by experienced staff when collecting samples or field measurements until such a time that the Project Officer (if applicable), Supervisor, or Program Manager determines that the individual can independently carry out data collection activities in accordance with this QAPP and any applicable SOPs. Specific requirements prior to conducting field work under this QAPP include:

- All individuals conducting work under this QAPP must be familiar with the Statewide Water Quality Management Plan/Continuing Planning Process (WQMP/CPP).
- All individuals conducting work under this QAPP must read the SWQB QMP and sign an acknowledgment form before conducting any data collection, compilation, management, or analysis activities. The QAO will provide these and other applicable documents to all new staff.
- All individuals conducting work under this QAPP must read the applicable SOPs and sign acknowledgment forms prior to conducting any data collection, compilation, management, or analysis activities. Supervisors will provide these and other applicable documents to all new staff. The Project Officer must verify that staff participating in data collection activities have read the relevant SOPs and signed the acknowledgment forms.
- All SWQB personnel conducting work under this QAPP are required to complete and maintain their Defensive Driving certification through the National Safety Council Defensive Driving Council. All SWQB personnel are responsible for keeping this certificate on their persons when operating or while in a State Vehicle as well as providing a copy of their certificate to their supervisor, the SWQB vehicle coordinator, and the NMED Human Resources Bureau.
- All individuals conducting work under this QAPP must read and provide written acknowledgment of understanding of the job hazards identified under the SWQB's Job Hazard Analyses (JHA).
- All individuals conducting work under this QAPP must undergo laboratory safety training by the SWQB's Laboratory Safety Officer and be familiar with and provide written acknowledgment of understanding of the SWQB's Chemical Hygiene Plan (CHP). No individual shall be allowed in the SWQB laboratory without training and acknowledgment of the SWQB's CHP or under the presence of at least one (1) trained SWQB staff.
- Personnel in the PSRS are required to receive NPDES inspector training, obtain EPA credentials and be familiar with this QAPP and EPA's NPDES Compliance Inspection Manual (EPA 2017). All new PSRS personnel must be accompanied on NPDES inspections by experienced inspection officers until the Program Manager or direct Supervisor determines that the staff person is appropriately trained and qualified to conduct an inspection, deal with compliance issues, and write an inspection report.
- Additional training may be required to conduct specific aspects of an individual's job duties, either in the field or in an office setting. These training events may be provided upon request of the individual, as resources allow, or as directed by the State Personnel Office, NMED Secretary, Deputy Secretary, Human Resources Bureau, Water Protection Division Director, SWQB Chief, Program Manager, Project Officer, or Supervisor.

A12. Documents and Records

This QAPP and referenced procedures include methods related to the collection, processing, analysis, reporting, and tracking of environmental information. This QAPP is updated, at a minimum, every five years and is made available by the QAO, on the SWQB webpage, to those responsible for collecting,

processing, and analyzing environmental information in accordance with this QAPP. When changes affect the scope, implementation, or outcome of assessment, this QAPP will be revised accordingly.

REPORTING DOCUMENTS

Numerous reporting documents are produced by the sections of the SWQB and are summarized in Table 4. In addition to the reports described below, many SWQB projects require the submittal of progress reports to provide periodic status reports on a project.

Table 4. Summary of SWQB Reporting Documents

Organizational Unit	Reporting Documents Produced	Description
PSRS	Inspection Reports	Inspection reports are partially based on a review and evaluation of records maintained by the facility and PSRS. Records reviews vary by the type of facility (different facilities/permits have different record keeping requirements) and may include monitoring reports, previous inspection reports, permit applications, permits, and past or current EPA enforcement actions, laboratory records, site self-inspection records, employee training records, nutrient management records, etc. Areas of concern from inspections are documented using EPA forms and templates and discussed in the Inspection Report. Inspections Reports include details on all observations made during an inspection and may include photographs taken during the inspection. Inspection reports are submitted to both the facility operator(s) and EPA. Inspection reports may be used to determine compliance with the federal CWA.
Monitoring, Assessment, and Standards Section (MASS)	State of NM CWA §303(d)/§305(b) Integrated Report and List (IR)	The Integrated Report is a summary of the water quality status of NM waters and the management actions necessary to protect and restore them. The Integrated List identifies whether or not a particular surface water of the state is currently meeting its designated uses. The documents are commonly referred to as the IR and are developed using the procedures described in the NMED SWQB Comprehensive Assessment and Listing Methodology (CALM) (NMED/SWQB 2023 or most current).
	Water Quality Survey Summaries	A summary of a water quality survey that includes a map of the study area, descriptions of the sampling stations, and an inventory of the sampling events.
	TMDL Planning Documents	A written plan and analysis established to ensure that a waterbody will attain and maintain WQS, including consideration of existing pollutant loads and reasonably foreseeable increases in pollutant loads.
	Project Summaries	Provide detailed information on the results of individual water quality planning activities completed for CWA §604(b) projects.
	State of NM Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC)	Establishes the designated uses for a waterbody in order to restore and maintain the chemical, physical, and biological integrity for the protection of aquatic life and for recreation in and on the water in accordance with the CWA. It further defines the water quality criteria determined to be protective of the designated uses and establishes the State's antidegradation policy for protection of waters.

Organizational Unit	Reporting Documents Produced	Description
	Statewide Water Quality Management Plan/Continuing Planning Process	Establishes the state's processes that are used for managing its water quality program and describes how water quality assessments are used to prioritize water quality problems and implement control measures.
	QMP	Describes the SWQB quality system for planning, implementing, documenting, and assessing the effectiveness of environmental data operations.
	QAPP	A planning document that describes the necessary QA procedures, QC activities, and other technical activities implemented by the SWQB.
WPS	NPS Annual Report	Provides an overview of NPS management-related activities conducted in NM each year and summarizes the status of NPS 319(h) projects, River Stewardship Program projects, and wetland restoration activities.
	NPS Management Plan	A management plan used by States for controlling pollution added from nonpoint sources to waters within the State and improving the quality of such waters.
	Watershed-Based Plans (WBPs)	Comprehensive reports with nine elements written to address water quality problems for impaired waterbodies and approved by EPA.
	Alternative Watershed-Based Plans	Alternative comprehensive reports written to address isolated water quality problems for impaired waterbodies, support response to NPS pollution emergencies like post-wildfire, or other scenarios as appropriate.
	Wetland Action Plans (WAPs)	Comprehensive reports designed to specifically address wetlands and riparian resources within the boundary of a specific watershed. The WAP develops and proposes avenues to protect, restore, and create wetlands in NM.
	Effectiveness Monitoring Success Stories	Used to report changes in water quality due to implementation of BMPs.
	Project Summaries	Provide detailed information on the results of individual watershed restoration projects.

RECORDS MANAGEMENT

SWQB maintains electronic and physical (as needed) files for all projects. Table 5 identifies the contents of each file type and the respective locations. The public has access to SWQB files in accordance with the Inspection of Public Records Act, NMSA 1978, Sections 14-2-1 et seq. and the NMED Inspection of Public Records Policy 01-06 (2004). The SWQB will retain project documents in accordance with applicable sections of New Mexico's Disposition of Public Records and Non-Records regulation, codified at 1.13.30 NMAC and Retention and Disposition of Public Records regulations, codified at 1.21.2 NMAC.

Table 5. Locations of Documents Available from the SWQB

Records	Locations	Contents
NPDES Permit Records, 401 Certifications, PSRS Public Files	Electronic Copy: on Agency server. Hard Copy (as needed): SWQB	All information pertaining to NPDES permits, 401 certifications, and inspections. Files are maintained by permit type. Individual permits are organized by facility and filed under facility, name and permit number. Individual permit files have subfolders for permits, permit processing, monitoring, inspections, and enforcement. General permits are

Records	Locations	Contents
	Library (Ste. N2104 Rolling Files)	organized by activity/permit and have subfolders for the permit and permit processing. Construction and industrial general permit coverage, including inspections, are organized chronologically in county folders. CAFOs are organized by facility name and coverage ID. MS4s are organized by urban area with subfolders for covered agencies. Inspections are included in the agency subfolder. Any additional records obtained from the facility during an NPDES inspection or submitted by a facility operator for clarification after an inspection are also filed under the appropriate "Inspections" file. Documents are maintained indefinitely; however, older files are transferred to an electronic filing system or archived.
MASS Project Files	Electronic Copy: on Agency server. Hard Copy (as needed): Project Officer or SWQB Library (Ste. N2104)	A project file is maintained for each project undertaken by the SWQB. The Project Officer creates the file immediately upon assignment and maintains the file until completion. Each project file includes all documents (hard copy and/or electronic copies) pertaining to the project, including data forms, data reports, QA/QC and Data Verification and Validation information, notes, etc. Once a project is considered complete, the file is transferred to the appropriate SWQB Library location. Project records (hard copy and electronic) being implemented by outside entities for the MASS are stored according to project-specific QAPPs.
QA Files	Electronic Copy: on SWQB server. Hard Copy (as needed): QA Officer's office or SWQB Library (Ste. N2104 Rolling Files)	QA files include all information relating to QAPP and QMP revisions, QAPP training, acknowledgment forms, project-specific QAPPs, SOPs, copies of Data Validation and Verification results, and Data Quality Assessment information.
Administrative Record for actions taken by the Water Quality Control Commission (WQCC)	Electronic Copy: on Agency server, and stored electronically by the New Mexico WQCC Hard Copy (as needed): Administrator for Boards & Commissions	The Administrative Record contains all documents that were submitted to the WQCC for the record to set forth their decisions regarding the development and revisions to the State's WQS, the approval of the 303(d)/305(b) IR, and issuance of TMDLs.
WPS Projects	Electronic Copy: on SWQB server. Hard copy (as needed): Individual Project Officer's office.	A project file is maintained for each project undertaken by the WPS. The Project Officer creates the file immediately upon assignment and maintains the file until completion. Each project file includes all documents (hard copy and/or electronic copies) pertaining to the project, including data forms, data reports, QA/QC and Data Verification and Validation information, notes, etc. Project records (hard copy and electronic) implemented by outside entities for the WPS are stored according to project-specific QAPPs.

Records	Locations	Contents
Effectiveness Monitoring Data	Electronic Copy: on SWQB server Hard copy (as needed): Project Officer's office.	A project file is maintained for each project undertaken by the Project Officer. The Project Officer creates the file immediately upon assignment and maintains the file until completion. Each project file includes all documents (hard copy and/or electronic copies) pertaining to the project, including data forms, data reports, QA/QC and Data Verification and Validation information, notes, etc.
Reporting Documents	Electronic Copy: on Agency server. Hard Copy (as needed): State Library, Program Manager and SWQB Library (Ste. N2050 or N2104 Rolling Files)	Table 4 provides details regarding SWQB reporting documents, content detailed in reports, and responsible SWQB Section. Contact the applicable Program Manager for more information.
Other Records	Electronic Copy: on Agency server. Hard Copy: SWQB Premises	Each Section within the SWQB maintains the documents produced by the section. In addition, each section also maintains reference and informational documents pertinent to that section. Contact the Program Manager for information on exact locations.

GROUP B. IMPLEMENTING ENVIRONMENTAL INFORMATION OPERATIONS

This section addresses all aspects of environmental information operations to ensure that appropriate procedures for acquiring direct and existing information are appropriate, reliable, defensible, and of sufficient quality to fulfill project goals and objectives for SWQB actions completed by staff or external entities on behalf of the SWQB.

B1. Identification of Project Environmental Information Operations

The environmental information operations for projects implemented under this QAPP will vary depending on the type of monitoring objective and goals identified in Table 1 (descriptions and applications of each data acquisition type are found in this table and additional information is found below). Project design for any activity using environmental data conducted by the SWQB must be completed and documented appropriately prior to sampling or use of acquired data commences to ensure data aptly reflects the study goals and meets the DQIs of this QAPP.

The systematic planning process requirements that must be incorporated and documented for SWQB projects are based on EPA's systematic planning requirements issued by the Chief Information Officer's *Environmental Information Quality Procedure* (CIO 2105-P-01.4) and are summarized in the SWQB QMP. The results of the systematic planning process requirements are recorded in the project design for each project implemented by the SWQB. FSPs document the planning process for environmental information operations conducted under this QAPP and are developed and approved using SWQB SOP 2.1 Development of Field Sampling Plans (FSPs).

Federally funded work being managed by the SWQB but administered by other entities will require a project-specific QAPP, that is reviewed and approved by the applicable Program Manager, Project Officer, QAO, and EPA prior to commencement of work. Those projects include those funded with CWA 106, 314, 319(h), 104(b)(3), and 604(b), and Water Infrastructure Improvements for the Nation (WIIN) Act grants.

NPDES PERMIT COMPLIANCE INSPECTIONS

The federal NPDES permit program is the principal mechanism used by New Mexico for the protection of its surface waters from pollution by point-source discharges. Under this program, a permit specifies the amounts and concentrations of contaminants that a permittee may discharge to a waterbody. In addition, various (depending on the type of facility permitted) administrative (e.g., signatory, reporting and legal, etc.) and procedural (e.g., frequency and type of monitoring and analysis, etc.) requirements, and specific structural (e.g., detention/retention basins, vegetated swales and natural depressions, infiltration of runoff onsite, etc.) and non-structural (e.g., good housekeeping, preventive maintenance, spill prevention and response procedures, periodic inspections, employee training, nutrient management, etc.) pollution prevention measures and practices may be specified.

New Mexico does not directly implement the federal NPDES permitting program; however, the PSRS provides assistance to EPA in the following ways:

- Conducting compliance inspections on behalf of EPA
- Providing information to the regulated community and the public
- Providing EPA with low flow conditions and ambient water quality for use in reasonable potential analysis and confirming river segments NMAC citations for receiving streams
- Reviewing NPDES permits proposed by EPA to ensure that these permits are compliant with applicable provisions of the federal CWA §§208(e), 301, 302, 303, 306, and 307 and appropriate requirements of state law
- Issuing CWA Section 401 State Certification for all NPDES permits to assure compliance with applicable state WQS
- Conducting outreach as appropriate to inform facilities of the requirements of NPDES permits

According to EPA policy, all active permitted facilities classified as major (municipal, non-municipal or federal) should be inspected periodically by either EPA or the SWQB's PSRS. Each year, EPA coordinates with the PSRS to identify inspections that will be conducted by the PSRS or EPA. Facilities classified as minor dischargers are inspected on a prioritized basis, primarily based on date of last inspection. Additional factors considered when determining which minor facilities to inspect include citizen complaints, specific requests from EPA, the facility status with respect to Significant Non-Compliance status, and proximity to the above major and traditional minor facility inspection locations.

Several methods are used for ensuring compliance with environmental laws and regulations. These include conducting NPDES compliance evaluation activities (e.g. inspections) to detect violations and create a strong enforcement presence. Enforcement actions may be taken by EPA against violators to correct violations. A principal function of an inspection, regardless of inspection type, is to detect and document violations at the facility. Evidence collected during the inspection supports the resulting enforcement action that will bring the facility into compliance with EPA and WQCC regulations. Requirements for inspection of NPDES permittees are addressed in §308 of the CWA. Guidelines for conducting these inspections are available in the NPDES Compliance Inspection Manual (EPA 305-K=001, Interim Revised Version, January 2017).

Commonly sampled parameters during an NPDES compliance inspection, sampling frequency, specific procedures, methods, and considerations are documented in SWQB SOP 8.3 for NPDES Wastewater Sampling. Any deviations from the generalized sampling plan set forth in SOP 8.3 are documented as part of the NPDES permit compliance sampling inspection.

ANTIDEGRADATION ANALYSIS

Antidegradation analysis and review are supported by ambient water quality monitoring data, effluent data, and critical flow/4Q3 data (the minimum four consecutive day flow that occurs with a frequency of once in three years in the receiving water). Ambient water quality monitoring data are the baseline data used for antidegradation determinations and is provided either by the SWQB MASS, or the permittee. Data provided by MASS follows SWQB SOPs (all listed in Appendix C) and the QA/QC requirements referenced in this QAPP, and data provided by the permittee follows their FSP and/or Sampling and Analysis Plan (SAP) with equivalent QA/QC requirements. Effluent data are provided by the permittee following their SOPs and BMPs with EPA approved methods. The SWQB PSRS team reviews their methods and data on a case-by-case basis. Lastly, the PSRS team utilizes 4Q3 for antidegradation in relation to where the permittee is discharging. Approved and peer-reviewed tools and methods are used for this analysis, including but not limited to, USGS Hydrologic Toolkit, StreamStats, and Bell and Tillery regression equations (Bell and Tillery, 2023). See Appendix A of the State of NM Statewide WQMP/CPP for more information.

AMBIENT WATER QUALITY MONITORING

The MASS conducts water quality surveys on waterbodies within basins throughout New Mexico. The primary objective of Bureau's Ambient Water Quality Monitoring is to assess designated use attainment for the IR and provide information to the public on the condition of surface waters of New Mexico. Specific details on SWQB's monitoring program can be found in the *10-Year Monitoring and Assessment Strategy* (NMED/SWQB 2016 or most current version). Information regarding specific sampling designs can be found in the FSPs. Approved FSPs contain details including sampling locations, sampling frequencies, dates/timeframes, sample size, frequency of QC samples, and describes chemical analytes and physical, chemical, biological, and continuous parameters being sampled.

Appendix D lists analytes and parameters typically collected for Ambient Water Quality Monitoring. Table 6 provides the common analytes and parameters used to assess WQS criteria set forth in 20.6.4 NMAC. For the complete list of WQS pertaining to NM's designated uses, see the numeric criteria in 20.6.4.900 NMAC and narrative criteria in 20.6.4.13 NMAC.

Table 6. Parameters Commonly Associated with Designated Uses

Designated Use	**Parameters**
Aquatic Life[1]	- Dissolved oxygen (DO), pH, specific conductance, and turbidity - Temperature (capturing summer season maximum) - Total nutrients[2], total metals[3], dissolved metals[4], hardness - Flow (if a stream) and depth (if a lake)
Primary or Secondary Contact	*Escherichia coli (E. coli),* pH, and Microcystin and other HABs-related toxins (as needed)

Designated Use	Parameters
Domestic Water Supply	Nitrate, total metals[3], dissolved metals[4], radionuclides[5], and organics[6]
Irrigation	pH, dissolved metals[4], TDS/TSS, hardness, chloride, and sulfate
Livestock Watering	Total nutrients[2], total metals[3], dissolved metals[4], and radionuclides[5]
Wildlife Habitat	Total metals[3] and cyanide
Human Health	Dissolved metals[4], organics[6], and emerging contaminants[7]

1 Parameters collected for aquatic life use are also used to assess narrative standards such as biological integrity, bottom deposits, plant nutrients, and turbidity.
2 Total Nutrients include nitrate + nitrite, ammonia, total Kjeldahl nitrogen, and total phosphorus and may also include Total Persulfate Nitrogen.
3 Total metals include aluminum, mercury, and selenium at a minimum.
4 Dissolved metals typically include aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.
5 Radionuclides include gross alpha/beta and Ra-226 + Ra-228 and Total Uranium.
6 Organics include base/neutral acid extractables (Method 8720) and volatile organic compounds (Method 8260).
7 Emerging contaminants include but are not limited to PFAS, PCBs, HABs-related toxins.

MONITORING FOR ENFORCEMENT PURPOSES

The environmental information operations for enforcement purposes will be developed on a case-by-case basis in cooperation with EPA and/or NMED's Office of General Counsel (OGC) and Compliance and Enforcement Director to determine sampling locations, frequency of data collection, and parameters to be sampled. As described above, this monitoring type requires systematic planning; however, due to possible enforcement action, the requirements of an FSP may not apply and are determined on a case-by-case basis by EPA or OGC.

INCIDENT RESPONSE MONITORING

Monitoring conducted in response to a known or suspected unpermitted release, discharge, or spill to a surface water body, requires systematic planning prior to data collection but does not require an FSP. All SWQB Teams may conduct Incident Response Monitoring that have reviewed and signed all applicable SOP(s) and acknowledgment form(s) required for data collection related to the incident.

HYDROLOGY PROTOCOL

The Hydrology Protocol (HP) is a survey method documented in Appendix C of the Department's WQMP/CPP used to collect information on the persistence of water in lotic systems. An FSP is not needed for data collection; however, training is required, and systematic planning is highly recommended.

SWQB WATERSHED PROTECTION PROJECTS

SWQB staff working in the WPS periodically conduct water quality surveys on waterbodies throughout NM for various projects including but not limited to development of watershed-based plans, determination of wetlands, and evaluation of wetland conditions. Projects implemented by outside entities that are not led by SWQB personnel must have their own project-specific QAPP.

Each project conducted by WPS, completed in-house, must have an FSP or SAP approved by the WPS Program Manager and the QAO. Should the proposed data collection be outside of the approved SWQB

SOPs or this QAPP, then a project-specific QAPP must be developed to be approved by the WPS Program Manager, QAO, and EPA Region 6 prior to commencing work.

EFFECTIVENESS MONITORING

The environmental information operations for watershed protection projects consist of monitoring for effectiveness and assessment purposes. Effectiveness Monitoring conducted by the Effectiveness Monitoring Coordinator (Project Officer) will not require a project-specific QAPP; however, an FSP documenting the planning process will be developed yearly prior to data collection by the Project Officer. The study design will generally consist of sampling stations upstream and downstream of the project areas, with sampling conducted before and after project implementation (Grabow et al. 1998). Exact monitoring locations will be determined in the field based on professional judgment, restoration locations, data gaps, data needs, known SWQB monitoring locations, and may require cooperator assistance for determining monitoring locations for specific projects. Should the proposed data collection be outside approved SWQB SOPs or this QAPP, additional information will be required and documented in an EPA-approved project-specific QAPP.

INDEPENDENT PROJECTS

The study design for SWQB Independent Projects (not including those conducted by outside entities) that are not identified specifically above, must have an FSP or SAP approved by the QAO and applicable Program Manager prior to implementing any work. In addition, these projects may require a project-specific QAPP to ensure QA of any data collection or compilation.

EXISTING INFORMATION

Projects that utilize existing information document the systematic planning process in project-specific documents that include FSPs, SAPs, or QAPPs.

MODELING

SWQB Projects that utilize modeling will be documented through a Modeling Objective(s) Form, or a project-specific QAPP (see section B4. Quality Control), both documents will capture systematic planning. The planning process will specifically address project-specific objectives for model outputs, document data inputs, and speak to QA/QC requirements for the model based on project objectives.

B2. Methods for Environmental Information Acquisition

FIELD ACTIVITIES ENVIRONMENTAL MEASUREMENTS

Methods of sample collection, preservation, and handling used in determining water quality as a part of this QAPP shall be in accordance with SWQB SOPs (see Appendix C for full list of SOPs or on the SWQB webpage: https://www.env.nm.gov/surface-water-quality/sop/) or with methods described in the following references or otherwise approved by EPA:

- "Guidelines establishing test procedures for the analysis of pollutants under the Clean Water Act," 40 Code of Federal Regulations (CFR) Part 136 or any test procedure approved or accepted by EPA using procedures provided in 40 CFR Parts 136.3(d), 136.4 and 136.5
- Standard Methods for the Examination of Water and Wastewater, latest edition, American Public Health Association

- Methods for Chemical Analysis of Water and Waste, and other methods published by EPA Office of Research and Development or Office of Water
- Techniques of Water Resource Investigations of the U.S. Geological Survey (USGS)
- Annual Book of American Society for Testing and Materials (ASTM) Standards. Volumes 11.01 and 11.02, Water (I) and (II), latest edition, ASTM International
- Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations
- National Handbook of Recommended Methods for Water-Data Acquisition, latest edition, prepared cooperatively by agencies of the U.S. Government under the sponsorship of the USGS
- Federal Register, latest methods published for monitoring pursuant to the Safe Drinking Water Act regulations
- EPA's most recent NPDES Compliance Inspection Manual
- Hydrology Protocol as published in Appendix C of the NMED's EPA approved WQMP/CPP

All field activities will be conducted in accordance with the SOPs; however, site conditions or project-specific data collection objectives may necessitate the use of alternative field procedures not included in the SOPs. The use of field methods other than those presented above or in the Bureau's SOPs must be approved prior to data collection by the applicable Program Manager and QAO and documented onto established SWQB forms or in designated field logbooks.

LABORATORY ANALYSES

Analytical methods shall be performed in accordance with methods listed in Appendix B, referenced in 20.6.4.14(A) NMAC, or otherwise approved by EPA for CWA purposes. Appendix B includes a list of common analytes and analytical methods for Ambient Water Quality Monitoring, Monitoring for Enforcement Purposes, Watershed Protection Projects, Effectiveness Monitoring, and other SWQB Projects.

Methods used for NPDES Permit Compliance Inspections and Evaluations shall be in accordance with those approved under 40 CFR Part 136 or other test methods specified in the permit or approved by the EPA Regional Administrator and should be sufficiently sensitive to evaluate compliance with the permit limits and requirements.

Prior to contracting with any outside laboratory, the laboratory's equipment, analytical methods, and QC procedures will be provided to the SWQB through a QAPP (or equivalent) to confirm they are in accordance with the procedures listed in this QAPP and current SWQB SOPs. Corrective action measures are described in the QMP and SWQB SOPs 15.0 and 16.1.

For most analytical analyses of samples, the SWQB uses the Air and Heavy Metals, Organics, Water, and Radiochemistry Sections of the NM SLD Chemistry Bureau. SLD uses a software-based Laboratory Information Management System (LIMS) to issue standardized result reports which include detection limits, quantitation limits, and data qualifiers. For detailed information on the detection limits and reporting conventions adopted by the SLD see Appendix E.

EXISTING INFORMATION

Most SWQB decisions made pursuant to this QAPP involve new data acquired using procedures described or referenced in this document. When decisions must be partially based on historical data, past data acquired by the SWQB are given preference because of known data quality. Data acquired by other sources will be reviewed by the Bureau but must be accompanied by supporting QA documentation and metadata in order to evaluate its usability.

Data collected by individuals or entities other than the SWQB to be used for enforcement of WQS under the NM WQA (74-6-10 NMSA), water quality assessments in development of the IR, TMDL development, or WQS amendments proposed by the SWQB must, at a minimum, meet the QA/QC requirements described in applicable SWQB SOPs and this QAPP. External data used in development of the IR must undergo a data quality determination by the QAO prior to use, for more information see Appendix A of the CALM (2023 or current).

Environmental information collected by EPA, or a permittee intended for use with NPDES Permit Compliance Inspections and Evaluation must be collected in accordance with 40 CFR 136 or other test methods specified in the permit or approved by the EPA Regional Administrator. Permittee data may be used by the SWQB Permit and Certification Team and Compliance and Enforcement Team to characterize pollutant concentrations in effluent at outfalls or monitoring locations that discharge to surface waters of the state.

Data collected by external entities intended for specific projects such as WBPs, WAPs, or effectiveness monitoring but not specifically conducted by the SWQB or under direct supervision of SWQB staff, or those projects that deviate from this QAPP must seek approval from the QAO before utilizing existing information in project development. The data collection must have been conducted under an approved QAPP or equivalent prior to conducting any work.

The SWQB uses established models for various environmental decision-making activities, including load reduction reporting, estimates for load-reduction in various water environments, air-water correlation, and aquatic toxicology that examines the bioavailability of analytes in the aquatic environments. Models will be used as described in modeling manuals (or equivalent). Modeling objectives will be documented through a Modeling Objective(s) Form or a project-specific QAPP. The applicable documents will be used to ensure the optimal model type is used for the intended project objective and to ensure data inputs are captured so that environmental decision-making based on model outputs is defensible.

B3. Integrity of Environmental Information

This section describes SWQB's efforts to ensure that each sample collected retains its original physical form and chemical composition from time of collection through its final disposition. The majority of the laboratory analyses are done at SLD. If another laboratory is used the SWQB ensures that the laboratory meets our QA/QC requirements.

SAMPLE HANDLING

The details of the sample handling procedures are found in the most current SWQB SOPs and NPDES Compliance and Inspection Manual, Chapter 5: Sampling (EPA 2017). A summary of the most common sample handling procedures is located in Appendix F. Amendments to EPA's sampling handling

requirements as listed under Table II at 40 CFR 136.3(e) "*Required Containers, Preservation Techniques, and Holding Times*" will be updated in relevant SWQB SOPs.

SAMPLE CUSTODY

For samples that require transport off-site or physical change of custody, SWQB practices two different chain of custody procedures: informal or formal.

Informal Chain of Custody Procedure:

Requires that the receiving laboratory acknowledge receipt of the samples by date stamping the submittal forms and providing copies of the stamped forms to the person delivering the samples. This date-stamped submittal form is then held as part of the record. This procedure, as outlined in SWQB SOP 8.2, ensures the integrity and quality of these samples. Unless specifically noted, this procedure is applied, as applicable, for Ambient Water Quality Monitoring, Hydrology Protocol Surveys, Watershed Protection Projects, Effectiveness Monitoring, Discharge Monitoring from a Point Source (except for compliance and enforcement purposes – see below), Incident Response Monitoring, Independent Studies, and other SWQB Projects not noted elsewhere.

Formal Chain of Custody Procedure:

Required for NPDES Permit Compliance Inspections and Monitoring for Enforcement Purposes. This procedure, as outlined in SOP 8.3, is intended to ensure the integrity of samples so they can be used as admissible evidence to enforce environmental laws and regulations. Facility samples taken in cases involving an enforcement or administrative action related to a permit, certificate, order, or potential violation of a regulation or law shall follow chain of custody procedures provided by the contracted analytical laboratory. Analysis sample containers are required to be sealed with evidence tape to uphold the integrity of the sample against tampering or contamination.

B4. Quality Control

QC activities are technical activities, including data verification and validation procedures, that measure the attributes and performance of a process, item or service against a defined standard performed on a routine basis to quantify the inherent variability of any environmental data measurement activity. The purpose of implementing QC activities is to reduce variability and uncertainty in the decision-making process. Additionally, the results obtained from the QC analysis, or data quality assessment, may identify areas where the variability can be reduced or eliminated in future data collection efforts, thereby improving the overall quality of the project. QC mechanisms are implemented as described under section A6. Information/Data Quality Objectives and Performance/Acceptance Criteria as well as the SWQB SOPs. Corrective actions, and how the effectiveness of the corrective action shall be determined and documented, is described in the QMP and SOPs 15.0 and 16.1.

FIELD DATA COLLECTION

The SWQB controls field data quality by using standardized methods documented in the most current SWQB SOPs. All personnel who collect environmental data must be familiar with these protocols, sign acknowledgment forms associated with specific SWQB SOPs and collect data according to the procedures defined therein.

The collection and analysis of field QC samples is an important part of the continuing effort to improve data quality by assessing and possibly refining the collection, transportation, and handling procedures.

Additional checks on the quality of field activities performed by the SWQB staff include periodic Quality Assurance Audits (QAAs). Projects to be audited are randomly selected and the audits performed by the QAO, or designee will use SWQB SOP 16.1 Technical System Audits.

BLANKS AND COLLECTION FREQUENCY

A blank sample is a sample that is processed and handled in the same manner as the associated environmental sample and is intended to be free of the analytes of interest. The frequency of blank collection is based on sampling run and the number of samples collected per sampling run. The SWQB defines a sampling run as a period of time used to represent the most common collecting period or grouping of sampling activities indicative of SWQB sampling operations. Typically, most samples are collected during multi-day collection events that depart and return to the office in a given business week. Blanks associated with a run are assumed to collectively represent a group of samples where the staff, equipment, vehicle, reagents, preservation, and storage remain constant. When multiple single-day trips are planned within a given week that maintain constant variables as described above, the single-day trips may be considered collectively as a run. The types and frequency of QC blank samples used by SWQB are outlined in SOP 8.2 Chemical Sampling in Lotic Environments.

BLANK VALIDATION CODES

An analysis of blank contamination is conducted during the data validation process. After validation is completed, qualifier codes are assigned to any data points that, based on the blank samples, may have been contaminated. Qualifier codes indicate to the data user that chemicals were detected in the associated blank and that the sample results may be compromised. See SOP 15.0 for detailed descriptions of blank validation codes.

FIELD DUPLICATES AND REPLICATES

SWQB may collect duplicates and replicates for chemical sampling as needed for special investigations. However, the SWQB does not routinely collect duplicate samples and instead relies on standard procedures and laboratory quality assurance to ensure the repeatability of the data. The SWQB does not routinely collect replicates during chemical sampling because replicate samples do not isolate sample collection and analytical error from environmental variability, and because a small set of replicate samples does not provide information that is useful for making decisions about the other samples on the sampling run.

LABORATORY QUALITY CONTROL

Chemical data received electronically are provided to the QAO who is responsible for reviewing the data prior to upload into SQUID. All chemical analytical results received by the SWQB must include the following information, at a minimum: Data source (the lab code from which the data originated), SWQB unique sample location ID, SWQB unique sample ID, sample collection date/time, laboratory sample number, sample analysis date/time, analytical method/suite/name, chemical abstracts service reference number (CASRN), concentration units, method detection limit, minimum reporting level, sample detection limit, and result concentration value and laboratory qualifier codes.

All analytical samples (except those bacteria samples analyzed in-house using IDEXX water microbiology test kits, see SWQB SOP 9.1 Bacteriological Sampling) are analyzed by laboratories that 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
- 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

The NM Department of Health SLD conducts most chemical analyses for SWQB. The laboratory reports Method Reporting Limits, and SDLs according to Appendix E, and their data qualifiers are listed in the Data Verification & Validation Worksheet located on the SWQB website. Statistical criteria used by the contract laboratories to validate and express the variability of analytical results are described in the QAPP or equivalent provided by each laboratory.

MODELING QUALITY CONTROL

A graded approach will be utilized for the use of models in SWQB projects and will examine the use of input data and parameter values for model development when used in environmental decision making. A graded approach is an important element of the SWQB's QA requirements because it allows the application of QA and QC activities to be adapted to meet the requirements of the project. When a project-specific QAPP is unnecessary, a Modeling Objective(s) Form is used and documents project-specific objectives, data inputs, and QA and QC requirements for data acceptance and rejection criteria for use in modeling. These criteria will support and defend decisions based on model outputs.

EFFECTIVENESS ANALYSIS

Effectiveness analysis utilizes a study design that generally consists of sampling stations both upstream and downstream of the project areas, with sampling conducted before and after project implementation. The data produced from this sampling design are analyzed according to procedures detailed in *Detecting Water Quality Changes before and After BMP Implementation: Use of a Spreadsheet for a Statistical Analysis* (Grabow et al. 1998). Before performing any statistical analyses to detect differences or change using Effectiveness Monitoring data, an "exploratory data analysis" will be done to confirm that the data are in the proper form for analysis. The Project Officer will check for autocorrelation and ensure data are normally distributed before data analysis and interpretation. Accounting for these variables allows for better documentation of the water quality change due to treatment type (Grabow et al. 1998). The regression analysis, used to determine differences or changes in water quality, is an analysis of covariance (ANCOVA), where two variables (e.g., water temperature and treatment type) are compared for a linear relationship. The statistical analysis is parametric and requires that the data be approximately normally distributed and independent (not autocorrelated).

B5. Instruments/Equipment Calibration, Testing, Inspection, and Maintenance

FIELD OPERATIONS

All field equipment requiring calibration must be calibrated in accordance with the most current SWQB SOPs and the manufacturer's instruction manual for each instrument. Calibration information specific to Sondes can be found in SOP 6.1 – Sondes. An electronic calibration log is kept on the agency server for each instrument which includes all calibration forms associated with the instrument.

All field equipment must undergo inspection and maintenance prior to each sampling trip. Complete procedures for operating and maintaining equipment used for collecting environmental measurements are contained in the manufacturer's instruction manual for each instrument and the most current SWQB SOPs. Results of equipment maintenance and inspections are noted in a dedicated file for each instrument and kept on the agency server. The SWQB maintains an equipment spreadsheet to review and track long-term monitoring devices, parts, and necessary components regularly throughout the lifetime of the project. Any deficiencies in equipment must be noted and reported immediately to the Project Officer or Program Manager, who will check the equipment and arrange for repair or replacement.

LABORATORY OPERATIONS

Analytical instruments and equipment used by contract laboratories are calibrated prior to each instrument analysis batch using manufacturer's recommended procedures and the guidelines provided in the Handbook for Analytical Quality Control (EPA 1979). All calibration procedures and equipment maintenance are validated and documented by the contract laboratory and are described in the laboratory's QAPP or equivalent. Information regarding SWQB analytical equipment and analysis of total coliforms and *E. coli* is provided in SWQB SOP 9.1.

OFFICE OPERATIONS

The SWQB has ongoing technical support for Department-owned computers, email services, printers, plotters, databases, geographical information systems, network servers, and software applications. Routine updates and repairs of information technology equipment are maintained by NMED's Office of Information Technology (OIT). Staff are responsible for reporting anomalies and malfunctions and reporting them to OIT in a timely manner.

B6. Inspection/Acceptance of Supplies and Services

The activities and procurement processes for supplies and consumables for all activities discussed under this QAPP adhere to the State of New Mexico's purchasing policy. The SWQB receives sample containers from SLD or IDEXX which go through the laboratory's and manufacturer's QA/QC acceptance criteria. For new containers, manufacturer certificates of contamination-free containers are accessible on their respective websites. Bottles and containers from SLD undergo a sterility check where every new batch contains one or two laboratory reagent blank controls and they look for a zero signal. If any contamination exists, it is documented in the control data. If contamination exists SLD would not use the lot and either send it back to the manufacturer or destroy it. All bottles from IDEXX have an associated lot/batch number printed on both the bottles and the order receipts. A certificate of analysis including all bottle QC specifications can be requested from IDEXX based on their lot/batch number (see Appendix G for example). Sample containers ordered directly by SWQB must be approved by the QAO for the planned analysis.

B7. Environmental Information Management

All data collected by the SWQB are maintained in either electronic and/or hard copy format. Document and records management are further detailed in A6. Information/Data Quality Objectives and Performance/Acceptance Criteria. Control mechanisms and lines of communication to address error correction and prevention of loss of information are discussed in C1. Assessments and Response Actions.

ELECTRONIC DATA MANAGEMENT

SWQB data obtained or received in electronic formats are imported or entered into the appropriate database(s) by the designated staff person dependent on data purpose and type. The primary data management tools used by the SWQB are summarized in Table 7.

Electronic data are initially managed on individual computers (backed up weekly) prior to being transferred to a specified location in the SWQB network server and then uploaded to SQUID. These data are filed and labeled in a consistent manner using a dedicated filing system.

To facilitate the integration of all of these tools, waterbodies are georeferenced or categorized based on geographic location. Additional categories are applied to waterbodies, such as assessment unit, watershed size/area, designated uses, ecoregion, elevation, habitat type, etc., to facilitate data comparability and communication within and among the assorted data management tools used by various water quality management programs.

Table 7. SWQB Data Management Tools

Data Management Tool	Description
SWQB Water Quality Database	Archival Access-based database used by the SWQB to house water quality data (chemical, physical, biological) collected by the Water Quality Monitoring Program for data collected in 2000- 2009.
SQUID	The SWQB's in-house Surface Water Quality Information Database (SQUID) is an integral tool for coordinated storing, assessing, and reporting of water quality data and conclusions between SWQB programs, to EPA, and to NM's stakeholders. This Oracle© database, developed and maintained by NMED's Information Technology Bureau, allows for required electronic reporting of monitoring data to EPA's water quality exchange (WQX) database and WQS attainment conclusions to EPA's ATTAINS database. SQUID also contains many survey planning and tracking tools and reports. SQUID was updated in 2018 to be compatible with EPA's newly redesigned ATTAINS database
ATTAINS	The Assessment, TMDL Tracking and Implementation System (ATTAINS) is an online system for accessing information about the conditions in the Nation's surface waters. ATTAINS tracks water quality assessment data, including use attainment, and causes and sources of impairment, and supports three principal functions: (1) Improve the quality and consistency of water quality reporting (2) Reduce the burden of preparing reports under CWA §§ 303(d), 305(b), 314, and 319 (3) Improve water quality data analysis ATTAINS provides data entry forms and automates the production of reports that NM submits to EPA through the 303(d)/305(b) process. The ATTAINS web reports also provide users with easy access to view the information on the status of waters at the national, state and site-specific waterbody levels.
SWQB's NPDES database	Oracle-based database that helps the SWQB track the status of the permits, the state's certification of the permits (and is not intended to duplicate database information maintained by EPA for NPDES permits), and inspection information. Permit information originates when either a permit application is received from an existing or potential permittee or when the EPA sends NMED a draft permit to be certified by the state. Inspection information

Data Management Tool	Description
	originates when a PSRS staff member conducts a Compliance Evaluation Inspection (CEI), Compliance Sampling Inspection (CSI), or any other formal inspection. The summary of the inspection report is entered into the database by the staff member who conducted the inspection. The database contains information about individual permits in relation to waterbody assessment units for integration into SWQB projects such as TMDL development and watershed assessment/planning activities. NMED is currently developing an enterprise Water Quality Permitting database for use by Ground Water Quality Bureau and SWQB. The database will feature electronic data reporting by permittees and electronic submittal of reports and notifications. The database is complaint with the EPA NET system. SOPs for data standardization and entry will be created.
Grants Reporting and Tracking System (GRTS)	The NPS Program's main reporting vehicle for the CWA Section 319 program. GRTS is a data management system that enables EPA and States to describe the progress they have made in implementing the national NPS Pollution program. GRTS electronically tracks projects and activities funded with CWA Section 319(h) funds and state funds.
Water Quality Exchange	The Water Quality Exchange (WQX) Data Warehouse (previously referred to as Storage and Retrieval System (STORET) is EPA's repository of the water quality monitoring data collected by water resource management groups across the country. WQX is populated with biological, chemical, and physical data on surface and ground water collected by federal, state and local agencies, Indian Tribes, volunteer groups, academics and others. SWQB flows data to WQX through NMED's node. Outside groups can submit data to WQX through the Water Quality Portal.

PAPER DATA MANAGEMENT

SWQB data obtained or received in hard copy format are entered into one of the databases identified in Table 7, by the Project Officer or designee and then imported into electronic format for processing. All hard copy paper data are filed and labeled in a consistent manner.

TYPES OF DATA COLLECTED AND SPECIFIC MANAGEMENT

Specific management pertaining to types of data collected by the SWQB are summarized in Table 8 below.

Table 8. Types of Data Collected and Specific Management

Type of Data Collected	Specific Management
Physio-chemical Field	Original field forms are entered into SQUID and kept in a project binder. Data are useable after verification and validation using most current SWQB SOP 15.0. Additional details on data storage and management are referenced in SWQB SOPs 8.2 and 12.0.
Chemical Analytical	Data originate when the contracted analytical laboratory produces results from water samples submitted by the SWQB. Data includes measurements from water column or sediment of chemical parameters such as ions, nutrients, metals, volatile organic compounds, microcystins, radionuclides, and PFAS. Data are reviewed by the QAO and an initial QAA is performed for the reported detection flags and project staff are informed of any issues found. Data are entered into the database and verification and validation are performed.

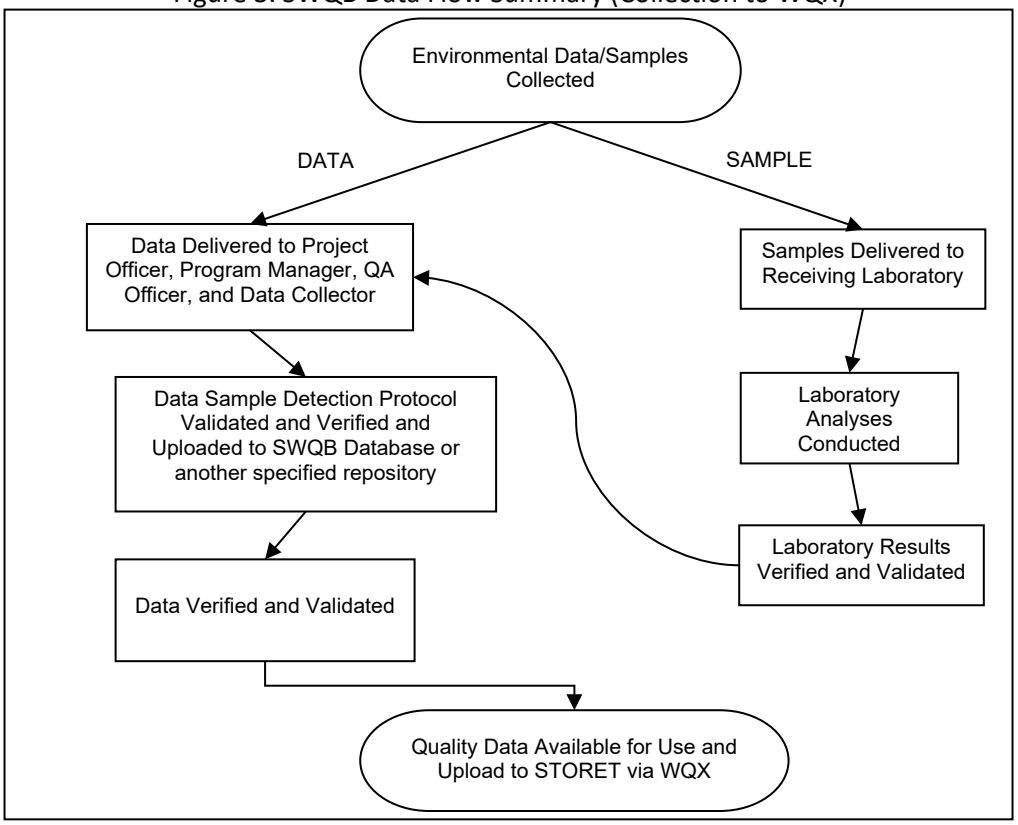
Type of Data Collected	Specific Management
	Data transformations must be performed on subsets of data in order to assess the attainment of WQS: • Hardness data are provided by the laboratory or calculated from a subset of metals data reported above a screening threshold set at the minimum possible standard. These metals include dissolved silver, dissolved cadmium, dissolved chromium, dissolved copper, dissolved lead, total aluminum, dissolved manganese, dissolved nickel, and dissolved zinc. • Gross alpha (Am-241 reference) transformations are completed for data reported at or above the quantification limit.
Fish Tissue	Data originate when the contracted analytical laboratory produces results from the fish tissue samples submitted by the SWQB. Data include measurements of toxic chemicals present in fish tissue such as mercury, DDT, and PCBs to be used for development of fish consumption advisories. Paper copies are maintained and organized by waterbody, eventually transferred to a summary spreadsheet. Electronic data are loaded into SQUID. The data are usable once incorporated into the summary spreadsheet and placed in the referenced repositories. Data are provided to EPA annually who maintain a national database for fish consumption advisories.
Ambient Toxicity	Data originate when EPA or contracted analytical laboratories produce results from water or sediment samples submitted by SWQB. These include results from analyses of water or sediment samples as measured by an organism's response upon exposure to the sample (e.g. lethality, impaired growth, or reproduction). These data are received from the lab in electronic or paper copies and are maintained by the Project Officer. Data are usable upon receipt from the lab.
Bacteriological	Data originate when a contracted analytical laboratory produces results from the water samples submitted by the SWQB or when the results are produced from analyses conducted in-house by SWQB staff using IDEXX equipment. Results received from analytical laboratories are managed in the same way as chemical analytical data. Bacteriological data include organism counts and counts from qPCR or digital PCR. If results are produced in-house, then the results are transcribed from the results form into a spreadsheet that is then uploaded to SQUID. Data are usable upon completion of verification and validation. Additional details are references in the most current SWQB SOP 9.1
Sonde and Data Logger	Data originate when uploaded from a recording device and exported to LTD Data Management spreadsheets. Data include parameters such as DO, pH, specific conductance, turbidity, and temperature which are recorded during long-term deployment in waterbodies. The data are QA'd following the most current SWQB SOP 6.4. Data are uploaded to SQUID. Data are useable following verification and validation.
Physical Habitat/ Geomorphology	Data originate when field measurements are recorded directly onto field forms by project team members. Data include physical habitat and geomorphological measurements such as percent canopy cover, pebble counts, cross-sections, etc. Each field form associated with habitat data are checked for completeness and accuracy by the crew lead in the field prior to leaving the site. Completely checked field forms are indicated by crew lead's initials on each page of field data. Physical habitat data are entered into electronic spreadsheets for upload to SQUID. Data are usable following verification and validation. Additional information if referenced in SWQB SOP 5.0.

Type of Data Collected	Specific Management
Flow	Data originate when directly recorded onto field forms by SWQB staff. Data include measurements recorded directly from flow meters or equipment or using best professional judgement, including entering a zero for dry, non-flowing streams. Upon returning from the field, the flow data are entered into an Excel template for flow discharge determination. All flow calculations are maintained by project and copies of the calculation spreadsheet are printed out and included in the project binder with the original field sheet. Once the calculations have been completed the results are entered into SQUID. The results are verified and validated. Additional details are referenced in SOP 7.0.
Macroinvertebrates	Data originate when a contracted taxonomic laboratory produces results from the macroinvertebrate samples submitted by SWQB. Macroinvertebrate data include ID to lowest practical taxon and enumeration of aquatic macroinvertebrate specimens collected from a waterbody. Results are received in electronic format and uploaded to SQUID, where a series of calculations are performed for use in biological assessments. The data are usable following verification and validation.
Periphyton/ Phytoplankton/ Zooplankton	Data originate when a contracted analytical or taxonomic laboratory produces biomass or community composition results from a periphyton, phytoplankton, or zooplankton sample submitted by SWQB. Results are received in electronic format and uploaded to SQUID and are usable following completion of verification and validation.
Hydrology Protocol	Data collected in accordance with the Hydrology Protocol are uploaded to SQUID upon review and verification following field data collection activities. Additional information for Hydrology Protocol field data form and storage can be found in Appendix C of the New Mexico Statewide WQMP/CPP.
Probable Source Determination	Identification of probable source(s) of pollutants are documented in the comment section of the Steam/River Field Data Form and Reservoir Field Data Form by staff in the field through visual observation during each sampling even and uploaded to SQUID.
Photographs	SWQB manages photographs on an individual project or survey basis. Photographs are only used as ancillary data to document project location and physical features in the project area. Photographs use predefined labeling conventions that incorporate site location, date, and watershed.

WQX

Quality data (post-verification and validation) in SQUID are submitted to Internal Node, which generates an XML file and submits it to WQX. WQX Web utilizes a standard set of data elements and internet protocols to create and store XML data submission files. The data are then imported by EPA staff to the WQX national data warehouse. Data uploaded to WQX include field data, chemical analytical data, and summary continuous data. All data that meet QA/QC specifications are uploaded to WQX. Figure 3 illustrates the data flow from SWQB field collection activities through the storage of validated data on the WQX system.

Figure 3. SWQB Data Flow Summary (Collection to WQX)



DATA ACCESS

SWQB staff have access to the data directly via the database(s). Other data users may obtain data through either requests to SWQB staff or through a formal Inspection of Public Records Act request submitted to the NMED. The Department, with assistance through OIT, manages access to databases for authorized personnel through a database access approval process.

GRANT REPORTING AND TRACKING SYSTEM (GRTS)

GRTS is an online EPA-mandated database for the Section 319 Nonpoint Source Program and can be accessed by EPA, SWQB staff, and the public. GRTS tracks project activities for Watershed Protection Section implementation and planning projects to improve water quality. Tracking information in GRTS begins when a contract or interagency agreement for on-the-ground water quality improvement projects or planning projects are approved. Each Watershed Protection Section project has an assigned SWQB Project Officer who is responsible for maintaining the project-specific information in GRTS. Upon being assigned a project, the Project Officer logs onto the GRTS database and enters mandatory and additional tracking elements for each project. The Project Officer is responsible for maintaining and updating the database throughout the course of the project. The information input into GRTS is usable immediately.

GROUP C. ASSESSMENT, RESPONSE ACTIONS, AND OVERSIGHT

This section addresses the activities for assessing the effectiveness of the implementation of environmental information operations and related QA/QC activities performed by the SWQB.

C1. Assessments and Response Actions

SWQB field sampling and measurement techniques are continually undergoing review and modification for possible improvements. The findings of procedural evaluations should be shared and discussed with other SWQB field personnel, Team Supervisors, and Program Managers. Problems encountered during a project will be immediately reported to the Project Officers, who will consult with appropriate individuals to determine appropriate action. Decisions will be made by Program Managers, Project Officers, and Team Leaders, with input from field staff, whether to continue with existing methods and techniques, switch to new methods and techniques, or to use combinations of both. Any changes to procedures covered or referenced by this QAPP will be documented. Should the corrective action impact the project or data quality, the Project Officer will alert the QAO. The collection of high-quality and representative data are always the most important consideration. It is important that all SWQB technical staff communicate throughout the entire project, from initial planning to final report publication.

QAAs will be conducted periodically to provide assessment of the implementation of the procedures outlined or referenced in this QAPP, detailed information on audits, including the number and frequency of assessments and timeframe for response actions can be found in SWQB SOP 16.1 Technical System Audit (TSA).

At the end of each field season, data are verified and validated by the SWQB Project Officer or designee to determine variability and data usability. The QAO will work with appropriate staff and summarize QA issues periodically. Problem areas will be identified through this process and the QAO and appropriate Project Coordinators will work to take corrective action. QA reports prepared by contract laboratories further help to determine accuracy and the limits of the data. Since analytical methods are continuously becoming more sensitive, this communication process is vital and on-going.

C2. Oversight and Reports to Management

Annual and final reports will be written by respective programs/projects and will include progress of the project, any available data, and any deviations from the initial plan. Reports are transmitted from the Project Officers to their immediate supervisor or Program Managers, and from Program Managers to the Bureau Chief. Any QA issues encountered are brought directly to the QAO. Printouts, status reports, or special reports for EPA will be prepared upon request. Electronic versions of the Verification and Validation (VV) Worksheets from any section will be provided to the to QAO for filing on the network server when data will be considered for enforcement of WQS under the NM WQA (74-6-10 NMSA), water quality assessments for development of the IR, or WQS amendments being proposed by the SWQB.

MASS

The Project Officer is responsible for keeping the Program Manager and Team Supervisors informed concerning the progress of the water quality survey or project(s) and any problems or anomalies encountered. The Project Officer or designee is responsible for maintaining and completing the applicable VV Worksheets and submitting a copy of the results to the QAO. The original VV Worksheets will be filed with the QAO, and electronic versions maintained on the network server.

WPS

The Project Officers are responsible for keeping the Program Manager and Team Supervisors informed concerning the progress of projects and any problems or anomalies encountered. Data collected by WPS

will follow the procedures outlined in the most current SOPs and project-specific QAPPs. The WPS maintain their own project binders along with original VV Worksheets.

PSRS

The Project Officer is responsible for keeping the Program Manager and Team Supervisors informed concerning the progress of projects and any problems or anomalies encountered. Data collected by PSRS will follow the procedures outlined in the most current SWQB SOPs. The PSRS maintains its own project binders along with original VV Worksheets.

ANALYTICAL REPORTING CONDUCTED BY LABORATORY

The SWQB QAO and technical personnel, in conjunction with appropriate laboratory staff, will determine if any corrective actions are necessary regarding laboratory analysis and reporting. Upon request, laboratories will submit a summary of data accuracy and precision, performance and system audit results, and discussion of significant QA problems and recommended solutions.

QA/QC

The QAO will periodically compile a summary report of all QA/QC issues encountered to be distributed to the contract laboratories, EPA Region 6, and appropriate SWQB staff. Any adopted changes will be subsequently reflected as changes to this QAPP.

GROUP D. ENVIRONMENTAL INFORMATION REVIEW AND USABILITY DETERMINATION

All data collected by the SWQB undergoes a series of verification and validation processes to ensure that the data are of sufficient quality and conform to a project's specific objectives. SWQB Water Quality Databases are maintained for data retrieval purposes only and all data maintained in these databases have undergone verification and validation in previous years.

D1. Environmental Information Review

Data review, verification, and validation are key steps to ensure data integrity, suitability, and usability. The data verification and validation procedures for chemical, physical, biological, and continuous data conducted by the SWQB are described in the most current SWQB SOP 15.0. This process establishes the criteria for accepting, rejecting, or qualifying data. The VV Worksheets serve as the summary of results for each type of data verified and validated. These worksheets serve as a record for the Project Officer and QAO, who will resolve any data quality issues. The QAO also uses the information provided in the VV Worksheets to prepare a summary of the issues that arose and the resulting resolution status on a periodic basis. Data used to make decisions regarding enforcement of WQS under the NM WQA (74-6-10 NMSA), water quality assessments for development of the IR, TMDL development, or WQS amendments proposed by the SWQB are required to have undergone a verification and validation procedure and a Data Quality Level determination issued by the SWQB QAO. More information is provided in the most current version of the CALM, Appendix A - Data Quality Tables.

Data validation and verification procedures and associated acceptance criteria used by a contract analytical laboratory are described in the QAPP (or equivalent) as provided by each laboratory. Statistical criteria used by the laboratory for validating and expressing the variability of analytical results are the standard deviation, coefficient of variation, range, 95-percent confidence limits, and control charts.

All data not meeting the appropriate QA/QC requirements as identified through the data verification and validation process are assigned appropriate laboratory qualifiers or SWQB validation codes. A summary of laboratory and SWQB's qualifier codes is provided in the SOP 15.0, Attachments B1-B5.

D2. Useability Determination

A data collected that have undergone the verification and validation procedures (or equivalent) are considered usable for enforcement of WQS under the NM WQA (74-6-10 NMSA), water quality assessments for development of the IR, TMDL development, or WQS amendments proposed by the SWQB. Data are considered usable once the data verification and validation process has been completed and the data have been accepted, rejected, or qualified. The SWQB uses the data to meet the objectives described in Section A of this QAPP. Guidelines for using qualified data for CWA §303(d)/ §305(b) attainment decisions and information on Data Quality Levels for consideration in development of the CWA §303(d)/ §305(b) IR are provided in the most current version of the CALM. In general, rejected data are considered unusable for assessment in the CWA §303(d)/ §305(b) IR or for compliance purposes. Other data that are qualified (as specified by qualifier or validation code), but not rejected, may be used provided the potential uncertainties associated with the data are addressed and appropriate caveats attached. The data are also provided to the public for use through EPA's WQX database.

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APPENDICES

Appendix A
NPDES Permit Compliance Inspection Type Descriptions

Inspection Type	*Description*
NPDES Compliance Evaluation Inspection	Collection and evaluation of data, including self-monitoring reports as a review of a permitted facility's records and a visual examination of the treatment facility, effluent, and receiving waters. The results may lead to enforcement action.
NPDES Offsite Compliance Inspection	Collection and evaluation of data, including self-monitoring reports as well as a review of a permitted facility's records and photographs of the treatment facility, effluent, and receiving waters. The results may lead to enforcement action.
NPDSE Compliance Sampling Inspection	Incorporates all components of a Compliance Evaluation Inspection and adds to it the collection of effluent samples and verification of flow measurements to determine effluent quality and permit compliance. Samples of the receiving stream above and below the outfall are also collected in some instances to evaluate the chemical impact of the effluent stream.
NPDES Performance Audit Inspection	Evaluation of a permittee's sampling, flow measurements, chain of custody, laboratory analysis, data compilation, reporting, and record-keeping procedures. The results may lead to enforcement action.
NPDES Reconnaissance Inspection	An abbreviated Compliance Evaluation Inspection often used to determine the general status of a facility or to focus on only one aspect of compliance, such as effluent quality, without performing a complete review.
NPDES Off-Site Desk Audit	A comprehensive off-site compliance evaluation of information, data, records, and facility reports to make a facility-level or program-level compliance determination. An Off-Site Desk Audit may include review of sampling and monitoring data, responses to CWA section 308 requests, compliance deliverables, discharge monitoring reports, annual reports, communications, and tips and complaints. The results may lead to enforcement action.
NPDES Compliance Biomonitoring Inspection	A review of a permittee's toxicity bioassay techniques and records maintenance to evaluate compliance with the biomonitoring terms of the NPDES permit and to determine whether the permittee's effluent is toxic. The results may lead to enforcement action.
NPDES Toxics Sampling Inspection	A Compliance Sampling Inspection focused on toxic substances regulated b the NPDES permit. A Toxics Sampling Inspection may evaluate influent, process operations, and treatment facilities to identify toxic substances requiring controls. The results may lead to permitting or enforcement action.
NPDES Diagnostic Inspection	Identification of the causes of facility permit noncompliance with suggestions of immediate remedies that will help the facility achieve compliance and support current or future enforcement action.
NPDES Pretreatment Compliance Inspection	Evaluation of publicly owned treatment work's (POTW) implementation of its approved pretreatment program, including a review of monitoring records, inspections, and enforcement activities for its industrial users. The Pretreatment Compliance Inspection may be supplemented with an inspection of any industrial user that discharges to the POTW. The results may lead to enforcement action.
NPDES Focused Compliance Inspection	Evaluation of a facility's compliance history, information about recent changes in the facility's operation, and other data for specific portions of a facility, permit or program to make a compliance determination. The results may lead to enforcement action.

NPDES Follow-Up Inspection	Conducted when a routine inspection or complaint identifies a compliance problem, the appropriate resources are assembled to deal effectively with a specific enforcement problem.
NPDES Sewage Sludge/Biosolids Inspection	Assessment of a facility engaged in a regulated sludge or biosolids activity to evaluate compliance with applicable regulatory provisions, including sludge monitoring, recordkeeping and reporting, treatment operations, sampling and laboratory quality assurance, and use or disposal practices. The results may lead to enforcement action.
NPDES Sanitary Sewer Overflow Inspections	Evaluates compliance with NPDES terms and conditions for system design, operation and maintenance, permit reporting requirements, an enforcement order, a consent decree, or another enforceable document after a known or suspected overflow event. The results may lead to enforcement action.
NPDES Stormwater Inspection	Evaluate compliance with NPDES permits for stormwater discharge by reviewing a site-specific Stormwater Pollution Prevention Plan (SWPPP) and related records and walking the site to verify that the SWPPP is accurate and Best Management Practices (BMPs) are in place and functioning properly. The results may lead to enforcement action.
NPDES Municipal Separate Storm Sewer System (MS4) Audit	Evaluation of MS4 stormwater management program implementation to identify problems the government or agency may have in implementing the program.
NPDES Municipal Separate Storm Sewer System Inspection	Review of elements of the MS4 stormwater management program to evaluate whether the MS4 is implementing an adequate program in the selected program elements. The results may lead to enforcement action.
NPDES Concentrated Animal Feeding Operation (CAFO) Inspection	A review of facility documents and records, such as a facility's permit, nutrient management plan, animal inventory, and all associated records, and on-site assessment of maintenance conditions and storage availability of the facility to evaluate compliance with applicable regulations and permit requirements. For CAFOs that land-apply manure, litter, or process wastewater, the inspection will include review of in-field and edge-of-field conservation practices and land application protocols to determining whether the CAFO has non-agricultural stormwater discharges from land application areas. The results may lead to enforcement action.

Appendix B
Analytical Methods and Detection Limits for:

Ambient Surface Water Quality Monitoring, Discharge Monitoring from Point Sources, Monitoring for Enforcement Purposes, Incident Response Monitoring, Watershed Protection Projects, Effectiveness Monitoring, and Independent Studies. *Methods and detection limits for NPDES Permit Compliance Inspections and Evaluations will be those approved under 40 CFR 136, specified in the permit or approved by the Regional Administrator, as appropriate.*

Analyte (Bold Indicates WQS)	CAS #	Fraction	Method #	MDL[1] (ug/l)
Alkalinity	E1640192	Total	SM 2320B	2875
Aluminum	7429-90-5	Dissolved	200.8	1.8
Aluminum	7429-90-5	Total	200.8	1.8
Ammonia	7664-41-7	Dissolved	350.1	21.76
Ammonia	7664-41-7	Total	350.1	21.76
Antimony	7440-36-0	Dissolved	200.8	0.035
Arsenic	7440-38-2	Dissolved	200.8	0.2
Asbestos	1332-21-4	Total	100.2	0.2 MFL
Barium	7440-39-3	Dissolved	200.8	0.22
Beryllium	7440-41-7	Dissolved	200.8	0.17
Bicarbonate	71-52-3	Total	SM 2320B	1340
Biological Oxygen Demand	N/A	Total	SM 5210B	2000
Boron	7440-42-8	Dissolved	200.7	3.8
Cadmium	7440-43-9	Dissolved	200.8	0.055
Calcium	7440-70-2	Total	200.7	8.38
Carbonate	3812-32-6	Total	SM 2320B	1600
Chemical Oxygen Demand	E1641638	Total	SM 5220D	10,000
Chloride	16887-00-6	Total	300	544
Chlorine Residual	7782-50-5	Dissolved	330.5	0.2
Chromium	7440-47-3	Dissolved	200.8	0.07
Chromium III	16065-83-1	Dissolved	N/A	1.38
Chromium VI	18540-29-9	Dissolved	N/A	1.38
Cobalt	7440-48-4	Dissolved	200.8	0.02
Copper	7440-50-8	Dissolved	200.8	0.38
Cyanide	57-12-5	Dissolved	335.4	2.98
Cyanide	57-12-5	Total	335.4	2.98
Dissolved Oxygen	7782-44-7	Total	360.1, D888-09C	N/A
Dioxin	1746-01-6	Total	8290	5 pg/L
Fluoride	7782-41-4	Total	340.2, SM 4500-F-C	100

Analyte (Bold Indicates WQS)	**CAS #**	**Fraction**	**Method #**	**MDL[1] (ug/l)**
Fluoride	7782-41-4	Total	300	39
Gross alpha (adjusted)	N/A	Total	Calculated	0.2 pCi/L
Gross Alpha	12587-46-1	Total	SM 7100B	0.1 pCi/L
Gross Beta	12587-47-2	Total	SM 7100B	0.1 pCi/L
Hardness (2.497*Ca + 4.118*Mg)	N/A	Dissolved	Calculated	N/A
Iron	7439-89-6	Dissolved	200.8	0.21
Lead	7439-92-1	Dissolved	200.8	0.0054
Magnesium	7439-95-4	Dissolved	200.7	1.3
Manganese	7439-96-5	Dissolved	200.7	0.011
Mercury	7439-97-6	Dissolved	245.1	0.01
Mercury	7439-97-6	Dissolved	200.8	0.007
Mercury	7439-97-6	Total	245.1	0.01
Methylmercury	22967-92-6	Total	1630	1.0 ng/g
Molybdenum	7439-98-7	Dissolved	200.8	0.03
Molybdenum	7439-98-7	Total	200.8	0.03
Nickel	7440-02-0	Dissolved	200.8	0.028
Nitrate + Nitrite	14797-55-8	Dissolved	353.2	14.5
Nitrate + Nitrite	14797-55-8	Total	353.2	14.5
Nitrate as N	84145-82-4	Total	353.2	5.73
Organic Carbon	7440-44-0	Dissolved	SM 5310C	500
Organic Carbon	7440-44-0	Total	SM 5310C	500
Orthophosphate	98059-61-1	Dissolved	365.1	3
pH	N/A	Total	150.2	N/A
Phosphate	7723-14-0	Dissolved	365.4	34.1
Phosphate	7723-14-0	Total	365.4	34.1
Polychlorinated biphenyls (PCBs)	1336-36-3	Total	1668A	0.00064
Potassium	7440-09-7	Total	200.7	20.68
Radium-226	13982-63-3	Total	903.1	0.14 pCi/L
Radium-226 + 228	N/A	Total	Calculated	N/A
Radium-228	15262-20-1	Total	904	0.21 pCi/L
Salinity	N/A	Total	2520A	N/A
Selenium	7782-49-2	Dissolved	200.9	0.27
Selenium	7782-49-2	Dissolved	200.8	0.23
Selenium	7782-49-2	Total	200.9	0.39

Analyte (Bold Indicates WQS)	CAS #	Fraction	Method #	MDL[1] (ug/l)
Selenium	7782-49-2	Total	200.8	0.23
Silicon	7440-21-3	Total	200.7	21
Silver	7440-22-4	Dissolved	200.8	0.02
Sodium	7440-23-5	Total	200.7	5
Specific Conductance	N/A	Total	120.1	N/A
Strontium	7440-24-6	Total	200.7	1.11
Strontium-90	10098-97-2	Total	SM 7110B	3 pCi/L
Sulfate	18785-72-3	Total	300	430
Temperature	N/A	Total	170.1	N/A
Thallium	7440-28-0	Dissolved	200.8	0.02
Turbidity	N/A	Total	ISO 7027	N/A
Total Dissolved Solids	E1642222	Total	SM 2540C	17350
Total Kjeldahl Nitrogen	E17148461	Total	351.2	62.5
Total Persulfate Nitrogen	5466-54-6	Total	SM 4500-N-C	10
Total Suspended Solids	E1642818	Total	SM 2540D	968
Tritium	10028-17-8	Total	N/A	N/A
Uranium	7440-61-1	Dissolved	200.8	0.02
Uranium	7440-61-1	Total	200.8	0.02
Uranium - 234 (isotopic)	15117-96-1	Total	Method 900	0.06 pCi/L
Uranium - 238 (isotopic)	7440-61-1	Total	Method 900	0.04 pCi/L
Vanadium	7440-62-2	Dissolved	200.8	0.06
Zinc	7440-66-6	Dissolved	200.8	0.57
Total Coliforms	E761700	Total	Colilert-182000, Colilert/2000, 9221, 9222	1 MPN/CFU
Escherichia coli	68583-22-2	Total	Colilert-182000, Colilert/2000, 9221, 9222	1 MPN/CFU
Microbial Source Tracking (MST)	N/A	Total	qPCR or digital PCR	N/A
1,1,1,2-Tetrachloroethane	630-20-6	Total	8260B	0.1
1,1,1-Trichloroethane	71-55-6	Total	8260B	0.4
1,1,2,2-Tetrachloroethane	79-34-5	Total	8260B	0.19
1,1,2-Trichloroethane	79-00-5	Total	8260B	0.1
1,1-Dichloroethane	75-34-3	Total	8260B	0.23
1,1-Dichloroethylene	75-35-4	Total	8260B	0.3
1,1-Dichloropropene	563-58-6	Total	8260B	0.2

Analyte (Bold Indicates WQS)	CAS #	Fraction	Method #	MDL[1] (ug/l)
1,2,3-Trichlorobenzene	87-61-6	Total	8260B	0.2
1,2,3-Trichloropropane	96-18-4	Total	8260B	0.12
1,2,4-Trichlorobenzene	120-82-1	Total	8270D	0.31
1,2,4-Trichlorobenzene	120-82-1	Total	8260B	0.22
1,2,4-Trimethylbenzene	95-63-6	Total	8260B	0.2
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	Total	8260B	0.15
1,2-Dibromoethane (Ethylene dibromide (EDB))	106-93-4	Total	8260B	0.14
1,2-Dichlorobenzene	95-50-1	Total	8270D	0.47
1,2-Dichlorobenzene	95-50-1	Total	8260B	0.12
1,2-Dichloroethane	107-06-2	Total	8260B	0.15
1,2-Dichloropropane	78-87-5	Total	8260B	0.12
1,2-Dinitrobenzene	528-29-0	Total	8270D	0.4
1,2-Diphenylhydrazine	122-66-7	Total	8270D	2
1,3,5-Trimethylbenzene	108-67-8	Total	8260B	0.2
1,3-Dichlorobenzene	541-73-1	Total	8270D	0.53
1,3-Dichlorobenzene	541-73-1	Total	8260B	0.16
1,3-Dichloropropane	142-28-9	Total	8260B	0.16
1,3-Dinitrobenzene	99-65-0	Total	8270D	0.91
1,4-Dichlorobenzene	106-46-7	Total	8270D	0.55
1,4-Dinitrobenzene	100-25-4	Total	8270D	0.35
1,4-Dioxane	123-91-1	Total	8260B	18
1-Methylnaphthalene	90-12-0	Total	8270D	0.32
2,2-Dichloropropane	594-20-7	Total	8260B	0.46
2,3,4,6-Tetrachlorophenol	58-90-2	Total	8270D	0.4
2,3,5,6-Tetrachlorophenol	935-95-5	Total	8270D	0.4
2,4,5-Trichlorophenol	95-95-4	Total	8270D	0.31
2,4,6-Trichlorophenol	88-06-2	Total	8270D	0.23
2,4-Dichlorophenol	120-83-2	Total	8270D	0.29
2,4-Dimethylphenol	105-67-9	Total	8270D	0.43
2,4-Dinitrophenol	51-28-5	Total	8270D	0.42
2,4-Dinitrotoluene	121-14-2	Total	8270D	0.2
2,6-Dinitrotoluene	606-20-2	Total	8270D	0.23
2-Butanone (MEK)	78-93-3	Total	8260B	2.2

Analyte (Bold Indicates WQS)	CAS #	Fraction	Method #	MDL[1] (ug/l)
2-Chloroethyl Vinyl Ether	110-75-8	Total	8260B	1
2-Chloronaphthalene	91-58-7	Total	8270D	0.23
2-Chlorophenol	95-57-8	Total	8270D	0.32
2-Chlorotoluene	95-49-8	Total	8260B	0.33
2-Hexanone	591-78-6	Total	8260B	0.39
2-Methylnaphthalene	91-57-6	Total	8270D	0.4
2-Methylphenol	95-48-7	Total	8270D	0.22
2-Nitroaniline	88-74-4	Total	8270D	0.34
2-Nitrophenol	88-75-5	Total	8270D	0.37
3,3'-Dichlorobenzidine	91-94-1	Total	8270D	0.45[2]
3-Methylphenol & 4-Methylphenol	108-39-4 & 106-44-5	Total	8270D	0.655
3-Nitroaniline	99-09-2	Total	8270D	0.96
4,4'-DDD	72-54-8	Total	8081A	0.0144[2]
4,4'-DDE	72-55-9	Total	8081A	0.00437[2]
4,4'-DDT	50-29-3	Total	8081A	0.00727[2]
4,6-Dinitro-2-methylphenol	534-52-1	Total	8270D	0.4
4-Bromophenyl Phenyl Ether	101-55-3	Total	8270D	0.19
4-Chloro-3-methylphenol	59-50-7	Total	8270D	0.32
4-Chloroaniline	106-47-8	Total	8270D	0.2
4-Chlorophenyl Phenyl Ether	7005-72-3	Total	8270D	0.41
4-Chlorotoluene	106-43-4	Total	8260B	0.2
4-Isopropyltoluene	99-87-6	Total	8260B	0.2
4-Methyl-2-pentanone	108-10-1	Total	8260B	1.0
4-Nitroaniline	100-01-6	Total	8270D	0.43
4-Nitrophenol	100-02-7	Total	8270D	0.4
Acenaphthene	83-32-9	Total	8270D	0.56
Acenaphthylene	208-96-8	Total	8270D	0.36
Acetone	67-64-1	Total	8260B	3.3
Acetonitrile	75-05-8	Total	8260B	7.6
Acrolein	107-02-8	Total	8260B	13[2]
Acrylonitrile	107-13-1	Total	8260B	1.5[2]
Alachlor	15972-60-8	Total	8270D	0.2
Alachlor	15972-60-8	Total	525.2	0.031

Analyte (Bold Indicates WQS)	CAS #	Fraction	Method #	MDL[1] (ug/l)
Aldrin	309-00-2	Total	8270D	0.2[2]
Aldrin	309-00-2	Total	525.2	0.015[2]
Aldrin	309-00-2	Total	8081A	0.025[2]
Allyl Chloride	107-05-1	Total	8260B	3.8
alpha-BHC	319-84-6	Total	8270D	0.1[2]
beta-BHC	319-84-6	Total	8081A	0.025
Aniline	62-53-3	Total	8270D	0.1
Anthracene	120-12-7	Total	8270D	0.44
Atrazine	1912-24-9	Total	8270C or D	0.03
Azobenzene	103-33-3	Total	8270D	0.28
Benzene	71-43-2	Total	8260B	0.2
Benzidine	92-87-5	Total	8270D	0.31[2]
Benzo(a)anthracene	56-55-3	Total	8270D	0.2
Benzo(a)pyrene	50-32-8	Total	8270D	0.43
Benzo(b)fluoranthene	205-99-2	Total	8270D	0.44
Benzo(g,h,i)perylene	191-24-2	Total	8270D	0.63
Benzo(k)fluoranthene	207-08-9	Total	8270D	0.35
Benzyl alcohol	100-51-6	Total	8270D	0.21
beta-BHC	319-85-7	Total	8270D	0.2[2]
beta-BHC	319-85-7	Total	8081A	0.025
bis(2-Chloroethoxy)methane	111-91-1	Total	8270D	0.49
bis(2-Chloroethyl)ether	111-44-4	Total	8270D	0.24
bis(2-Chloroisopropyl)ether	108-60-1	Total	8270D	0.46
bis(2-Ethylhexyl)adipate	103-23-1	Total	8270D	1
bis(2-Ethylhexyl)phthalate	117-81-7	Total	8270D	1
Bromobenzene	108-86-1	Total	8260B	0.12
Bromochloromethane	74-97-5	Total	8260B	0.21
Bromodichloromethane	75-27-4	Total	8260B	0.2
Bromoform	75-25-2	Total	8260B	0.34
Bromomethane	74-83-9	Total	8260B	13
Butylbenzyl Phthalate	85-68-7	Total	8270D	0.36
Carbazole	86-74-8	Total	8270D	0.18
Carbon Disulfide	75-15-0	Total	8260B	0.2

Analyte (Bold Indicates WQS)	CAS #	Fraction	Method #	MDL[1] (ug/l)
Carbon Tetrachloride	56-23-5	Total	8260B	0.2
Chlorobenzene	108-90-7	Total	8260B	0.16
Chloroethane	75-00-3	Total	8260B	1.4
Chloroform	67-66-3	Total	8260B	0.2
Chloromethane	74-87-3	Total	8260B	0.37
Chloroprene	126-99-8	Total	8260B	0.33
Chrysene	218-01-9	Total	8270D	0.26[2]
cis-1,2-Dichloroethene	156-59-2	Total	8260B	0.2
cis-1,3-Dichloropropene	10061-01-5	Total	8260B	0.15
cis-1,4-Dichloro-2-butene	1476-11-5	Total	8260B	1.1
cis-Chlordane (alpha-chlordane)	5103-71-9	Total	8270D	0.2
cis-Chlordane (alpha-chlordane)	5103-71-9	Total	8081A	0.015
Chlordane	57-74-9	Total	8270D	0.2[2]
Chlordane	57-74-9	Total	8081A	0.3[2]
Cyanazine	21725-46-2	Total	525.3	0.2
delta-BHC	319-86-8	Total	8270D	0.2
delta-BHC	319-86-8	Total	8081A	0.025
Dibenz(a,h)anthracene	53-70-3	Total	8270D	0.66
Dibenzofuran	132-64-9	Total	8270D	0.23
Dibromochloromethane	124-48-1	Total	8260B	0.25
Dibromomethane	74-95-3	Total	8260B	0.13
Dichlorodifluoromethane	75-71-8	Total	8260B	0.35
Dieldrin	60-57-1	Total	8270D	0.1[2]
Dieldrin	60-57-1	Total	8081A	0.025[2]
Diethylphthalate	84-66-2	Total	8270D	0.35
Dimethylphthalate	131-11-3	Total	8270D	0.26
Di-n-butyl Phthalate	84-74-2	Total	8270D	0.59
Di-n-octyl phthalate	117-84-0	Total	8270D	0.33
Endosulfan I (alpha)	959-98-8	Total	8270D	0.1[2]
Endosulfan I (alpha)	959-98-8	Total	8081A	0.025
Endosulfan II (beta)	33213-65-9	Total	8270D	0.2[2]
Endosulfan II (beta)	33213-65-9	Total	8081A	0.025
Endosulfan sulfate	1031-07-8	Total	8270D	0.2

Analyte (Bold Indicates WQS)	CAS #	Fraction	Method #	MDL[1] (ug/l)
Endosulfan sulfate	1031-07-8	Total	8081A	0.01
Endrin	72-20-8	Total	8270D	0.2[2]
Endrin	72-20-8	Total	8081A	0.025
Endrin aldehyde	7421-93-4	Total	8270D	0.1
Endrin aldehyde	7421-93-4	Total	8081A	0.025
Endrin ketone	53494-70-5	Total	8270D	0.2
Endrin ketone	53494-70-5	Total	8081A	0.025
Ethyl Methacrylate	97-63-2	Total	8260B	0.79
Ethylbenzene	100-41-4	Total	8260B	0.2
Fluoranthene	206-44-0	Total	8270D	0.28
Fluorene	86-73-7	Total	8270D	0.36
gamma-BHC (lindane)	55963-76-6	Total	8270D	0.1
gamma-BHC (lindane)	55963-76-6	Total	8081A	0.05
Heptachlor	76-44-8	Total	8270D	0.019[2]
Heptachlor	76-44-8	Total	8081A	0.025[2]
Heptachlor epoxide	1024-57-3	Total	8270D	0.2[2]
Heptachlor epoxide	1024-57-3	Total	8081A	0.025[2]
Hexachlorobenzene	118-74-1	Total	8270D	0.23[2]
Hexachlorobutadiene	87-68-3	Total	8270D	0.27
Hexachlorobutadiene	87-68-3	Total	8260B	0.31
Hexachlorocyclopentadiene	77-47-4	Total	8270D	0.32
Hexachloroethane	67-72-1	Total	8270D	0.2
Indeno(1,2,3-cd)pyrene	193-39-5	Total	8270D	0.41[2]
Iodomethane	74-88-4	Total	8260B	0.68
Isobutyl Alcohol	78-83-1	Total	8260B	10
Isophorone	78-59-1	Total	8270D	0.43
Isopropylbenzene	98-82-8	Total	8260B	0.2
meta para Xylene mix	108-38-3 & 106-42-3	Total	8260B	0.32
Methacrylonitrile	126-98-7	Total	8260B	4.4
Methoxychlor	72-43-5	Total	8270D	0.024
Methoxychlor	72-43-5	Total	8081A	0.075
Methyl Methacrylate	80-62-6	Total	8260B	0.15
Methylene Chloride (Dichloromethane)	75-09-2	Total	8260B	0.1

Analyte (Bold Indicates WQS)	CAS #	Fraction	Method #	MDL[1] (ug/l)
Metolachlor	51218-45-2	Total	525.2	0.1
Metribuzin	21087-64-9	Total	525.2	0.1
Naphthalene	91-20-3	Total	8270D	0.42
Naphthalene	91-20-3	Total	8260B	0.24
n-Butylbenzene	104-51-8	Total	8260B	0.3
Nitrobenzene	98-95-3	Total	8260B	5.4
Nitrobenzene	98-95-3	Total	8270D	0.27
N-nitrosodimethylamine	62-75-9	Total	8270D	0.36[2]
N-nitroso-di-n-propylamine	621-64-7	Total	8270D	0.4[2]
N-nitrosodiphenylamine	86-30-6	Total	8270D	0.31
ortho-Xylene	95-47-6	Total	8260B	0.2
Pentachloroethane	76-01-7	Total	8260B	0.2
Pentachlorophenol	87-86-5	Total	8270D	0.27
Phenanthrene	85-01-8	Total	8270D	0.45
Phenol	108-95-2	Total	8270D	0.58
Prometryn	7287-19-6	Total	619	0.1
Propionitrile	107-12-0	Total	8260B	4.3
Propylbenzene	103-65-1	Total	8260B	0.2
Pyrene	129-00-0	Total	8270D	0.21
Pyridine	110-86-1	Total	8270D	0.46
sec-Butylbenzene	135-98-8	Total	8260B	0.2
Simazine	122-34-9	Total	525.2	0.022
Styrene	100-42-5	Total	8260B	0.13
tert-Butyl Methyl Ether (MTBE)	1634-04-4	Total	8260B	0.32
tert-Butylbenzene	98-06-6	Total	8260B	0.2
Tetrachloroethene	127-18-4	Total	8260B	0.19
Tetrahydrofuran (THF)	109-99-9	Total	524.2	7.9
Toluene	108-88-3	Total	8260B	0.2
Toxaphene	8001-35-2	Total	8081A	0.075[2]
Toxaphene	8001-35-2	Total	508.1	0.013[2]
trans-1,2-Dichloroethene	156-60-5	Total	8260B	0.2
trans-1,3-Dichloropropene	10061-02-6	Total	8260B	0.31
trans-1,4-Dichloro-2-butene	110-57-6	Total	8260B	0.5

Analyte (Bold Indicates WQS)	CAS #	Fraction	Method #	MDL[1] (ug/l)
trans-Chlordane	5103-74-2	Total	8081B	0.2
Trichloroethene	79-01-6	Total	8260B	0.2
Trichlorofluoromethane	75-69-4	Total	8260B	0.3
Bromoform	75-25-2	Total	8260B	0.34
Chloroform	67-66-3	Total	8260B	0.18
Dichlorobromomethane	75-27-4	Total	8260B	0.2
Chlorodibromomethane	124-48-1	Total	8260B	0.25
Vinyl Acetate	108-05-4	Total	8260B	0.4
Vinyl Chloride	75-01-4	Total	8260B	0.3
Xylene	1330-20-7	Total	8260B	0.12
Mercury	7439-97-6	Tissue	7471A	9.9 ug/kg
Selenium	7782-49-2	Tissue	6020	98 ug/kg
Aldrin	309-00-2	Tissue	8081	0.14 ug/kg
Dieldrin	60-57-1	Tissue	8081	0.16 ug/kg
Endosulfan sulfate	1031-07-8	Tissue	8081	0.53 ug/kg
Endrin	72-20-8	Tissue	8081	0.21 ug/kg
Endrin aldehyde	7421-93-4	Tissue	8081	0.35 ug/kg
Endrin ketone	53494-70-5	Tissue	8081	0.32 ug/kg
Heptachlor	76-44-8	Tissue	8081	0.51 ug/kg
Heptachlor epoxide	1024-57-3	Tissue	8081	0.17 ug/kg
Lindane	58-89-9	Tissue	8081	0.21 ug/kg
Methoxychlor	72-43-5	Tissue	8081	2.4 ug/kg
Toxaphene	8001-35-2	Tissue	8081	20 ug/kg
cis-Chlordane	5103-71-9	Tissue	8081	0.17 ug/kg
p,p'-DDD	72-54-8	Tissue	8081	0.29 ug/kg
p,p'-DDE	72-55-9	Tissue	8081	0.22 ug/kg
p,p'-DDT	50-29-3	Tissue	8081	0.79 ug/kg
trans-Chlordane	5103-74-2	Tissue	8081	0.18 ug/kg
.alpha.-Endosulfan	959-98-8	Tissue	8081	0.19 ug/kg
.alpha.-Hexachlorocyclohexane	319-84-6	Tissue	8081	0.14 ug/kg
.beta.-Endosulfan	33213-65-9	Tissue	8081	0.81 ug/kg
.beta.-Hexachlorocyclohexane	319-85-7	Tissue	8081	0.55 ug/kg
.delta.-Hexachlorocyclohexane	319-86-8	Tissue	8081	0.22 ug/kg

Analyte (Bold Indicates WQS)	**CAS #**	**Fraction**	**Method #**	**MDL[1] (ug/l)**
Polychlorinated biphenyls (PCBs) Congeners, Total Blank Corrected	1336-36-3	Tissue	1668A	0.5 ug/kg

[1] The MDL information presented is based primarily on the NMDOH Scientific Laboratory Division and contract laboratory reported limits. These limits are approximate and may change based on laboratory and individual sample performance.
[2] MDL may be greater than the water quality criterion defined in 20.6.4.900 NMAC.

SWQB samples analyzed for PFAS must be analyzed at an accredited laboratory (for PFAS) certified to analyze a suite of analytes for either EPA method 533, EPA method 537.1, or EPA draft method 1633 (or equivalent). A list of analytes for each EPA method conducted by SLD can be found in SLD PFAS analyte list as outlined in SOP 8.4 Per- and Polyfluoroalkyl Substances (PFAS) Sample Collection.

Appendix C
SWQB Standard Operation Procedures

Also see Standard Operating Procedures (nm.gov) for access to updated SOPs.

SWQB SOPs	Description	Purpose
1.0 General		
1.1 SOP Creation & Maintenance	Describes the process for creating, reviewing, and maintaining SOPs for the SWQB.	Template for creating SOPs.
2.0 Planning		
2.1 Development of Field Sampling Plans (FSP)	Describes the process for preparing and implementing an FSP.	Serves as the comprehensive record for each project.
3.0 RESERVED		
3.0 RESERVED	*Pending*	*Pending*
4.0 Field Observations		
4.1 Probable Source Determination	Describes the process for developing a qualitative evaluation of probable sources of impairment based on visual observations made by professionals in the field.	Used to incorporate information into Total Maximum Daily Loads (TMDLs) and the Clean Water Act (CWA) §303d/§305b Integrated List.
4.2 Photo-documentation	*Pending*	*Pending*
Hydrology Protocol – Appendix C of the WQMP/CPP	Provides the methodology for distinguishing among ephemeral, intermittent and perennial streams and rivers in New Mexico.	Used to provide technical support for an UAA and is required for the expedited UAA process (20.6.4.15.C NMAC).
5.0 Physical Habitat		
5.0 Physical Habitat	Describes the procedure for measuring the physical habitat attributes and geomorphic characteristics relating to the dimension, pattern, and profile of wadeable streams.	Used by SWQB to ensure physical habitat measurements are collected in accordance with SOP so that accurate defensible data is collected by SWQB.
6.0 Sondes & Thermographs		
6.1 Sondes	Describe the procedure for calibrating and maintaining water quality monitoring sondes and dataloggers for collection of instantaneous or unattended measurements.	Used by SWQB to ensure that sondes and dataloggers used by SWQB are properly calibrated, checked and maintained in accordance with SOP so that accurate defensible data is collected by SWQB.
6.2 DO and Conductivity Loggers	Describes the procedure for deploying water quality monitoring sondes and dataloggers (excluding thermographs) in rivers and streams for instantaneous or unattended measurements.	Used by SWQB to ensure that sondes and dataloggers (excluding thermographs) are deployed in accordance with SOP so that accurate defensible data is collected by SWQB.
6.3 Thermographs	Describe the procedure for deploying temperature data loggers s in rivers and streams for unattended measurements. Also, include maintenance procedures for temperature loggers.	Used by SWQB to ensure that temperature data loggers are deployed and maintained in accordance with SOP so that accurate defensible data is collected by SWQB.
6.4 Long-term Deployment Data Logger QA & Upload	Describe the procedures for retrieving recorded data from sondes and datalogger. Used to assess	Used by SWQB for retrieving recorded data from sondes and data loggers,

	the quality of data from sondes and dataloggers in water. Details how to standardize data formatting in Excel; for uploading data into SQUID.	assessing data quality and details the procedure used for uploading data into SQUID.
7.0 Flow		
7.0 Flow	Describes the process and equipment for measuring stream flow in rivers and streams.	Used by SWQB to ensure that flow is collected in accordance with SOP so that accurate defensible data is collected by SWQB.
8.0 Chemical Sampling		
8.1 Chemical Sampling – Equipment Cleaning Procedure	Describes the procedure, equipment, and supplies, needed to clean typical water chemical sampling equipment.	Used by SWQB when cleaning and maintaining sampling equipment.
8.2 Chemical Sampling in Lotic Environments	Describe the sample collection techniques, preservation and acidification requirements, equipment, and quality control activities associated with the chemical sampling of surface water in lotic environments.	Used by SWQB when sampling for total suspended solids, total dissolved solids, nutrients, metals, hardness, radionuclides, cyanide, organics, etc. in lotic environments to ensure accurate defensible data is collected according to SOP.
8.3 NPDES Wastewater Sampling	Describes the methods and considerations to be used and observed when collecting wastewater samples for field screening and details laboratory analysis procedures during NPDES Compliance Sampling Inspections.	Used by SWQB when sampling surface water for NPDES compliance sampling inspections.
8.4 PFAS Sample Collection	Describes the sample collection techniques, preservation requirements, equipment, and quality control activities associated with sampling of per- and polyfluorinated alkyl substances (PFAS).	Used by SWQB when sampling for PFAS.
9.0 Bacteriological Sampling		
9.1 Bacteriological Sampling	Describes the collection and analysis of ambient water and wastewater samples for total coliform and E. coli using the IDEXX laboratories, Inc. Colilert method for water quality standards assessment and permit compliance monitoring.	Used by SWQB when sampling for total coliform and E. coli.
11.0 Biological Sampling		
11.1 Benthic Macroinvertebrates	Describe the sample collection techniques, preservation requirements, equipment, and quality control activities associated with benthic macroinvertebrate sampling.	Used by SWQB when sampling for benthic macroinvertebrate to ensure accurate defensible data is collected according to SOP.
11.2 Periphyton	Describes the sample collection techniques, preservation requirements, equipment, and quality control activities associated with periphyton sampling in lotic environments.	Used by SWQB when sampling for periphyton to ensure accurate defensible data is collected according to SOP.
11.3 Phytoplankton	*See Lake Sampling SOP*	
11.4 Fish Community Sampling	Describe the process of fish collection for fish community studies. NMED/SWQB only collects fish for community studies in lotic waters.	Used by SWQB when sampling for fish community studies to ensure accurate defensible data is collected according to SOP.

11.5 Fish Consumption Advisory Program	Describe the development process for Fish Consumption Advisories to determine the presence of environmental contaminants in fish.	Used by SWQB when sampling fish tissue to ensure accurate defensible data is collected according to SOP.
12.0 Lake Sampling		
12.1 Lake Sampling	Describe the sample collection techniques, preservation requirements, equipment, and quality control activities associated with chemical, physical, and biological sampling of surface water in lentic environments.	Used by SWQB when sampling for chemical, physical, and biological characteristics of surface water in lentic environments.
13.0 Specialized Monitoring		
13.1 Probabilistic Monitoring	Describes probabilistic monitoring which is a randomized sample design for stream monitoring that includes sample collection for physical habitat measurements, benthic macroinvertebrate samples, flow data, sonde grab data and collecting both chemical and bacteriological samples at each sampling site.	Used by the SWQB for data collection that provides an unbiased data set for evaluation of the condition of the state's perennial, wadeable streams.
14.0 File Management		
14.2 QA/QC File Management	*Pending*	*Pending*
15.0 Data Verification and Validation		
15.0 Data Verification and Validation Procedures	Describe activities associated with the validation and verification of chemical, physical, and biological data.	Used by SWQB staff for verification and validation of data collected under the SWQB.
16.0 SWQB Audits		
16.1 Technical System Audit (TSA)	Describe in detail how a TSA will be conducted for the various NMED SWQB projects.	Used by the SWQB to establish and implement an effective audit and assessment program.

Appendix D
Ambient Water Quality Monitoring Commonly Sampled Parameters

Analytical Suite	Parameters	Notes, if applicable
Field Parameters	pH	Both instantaneous and long-term deployment
	Temperature	Both instantaneous and long-term deployment
	Specific Conductance	Both instantaneous and long-term deployment
	Dissolved Oxygen (DO)	Both instantaneous and long-term deployment
	Turbidity	Both instantaneous and long-term deployment
	Flow (Discharge)	Flow not taken if stream gage present
Metals	Dissolved Metals	List of specific metals identified in FSP
	Total Metals	Total Al: 10 µm filter for Turbidity > 30 NTU, List of specific metals identified in FSP
Anion and Cations	Alkalinity	
	Bicarbonate	
	Calcium	For hardness calculation
	Carbonate	
	Chloride	Subject to segment-specific numeric criteria
	Dissolved Organic Carbon (DOC)	Model input parameter for metals and nutrients
	Hardness	Must be collected concurrently with metals for which the WQS criterion is “hardness dependent”
	Magnesium	For hardness calculation
	Sulfate	Subject to segment-specific numeric criteria
	Total Dissolved Solids	Subject to segment-specific numeric criteria
	Total Suspended Solids	
Nutrients	Ammonia	
	Nitrate plus Nitrite	
	Phosphorus, Total	
	Total Kjeldahl Nitrogen	
	Total Persulfate Nitrogen	
Bacteria	Escherichia coli	Primary and Secondary Contact
	Total Coliform	
Organic Chemicals	Base/Neutral/Acids Semivolatiles (SVOCs)	See USEPA Method 8270D or Appendix B for list of specific SVOCs analyzed
	Volatile Organic Chemicals (VOCs)	See USEPA Method 8260B or Appendix B for list of specific VOCs analyzed
	PCBs	Congeners, Blank Corrected
Radionuclides	Radium 226/228	Required for adjusted Gross α/Gross β
	Gross α/Gross β	
	Total Uranium	Required for adjusted Gross α/Gross β
Other Parameters	Cyanide	WQS criteria is for total recoverable cyanide
	Total Chlorine Residuals	
	Chlorophyll a	Collected for nutrient assessment
	Microcystin	Algal toxin affecting recreational use
Toxicity	Ambient Toxicity	Analysis performed by USEPA Region VI
Biological	Macroinvertebrates	
	Fish Community	
	Fish Tissue	Analyzed for PCBs, Hg, Se, DDT or other contaminants of concern
	Periphyton	

	Phytoplankton	
	Zooplankton	
Physical Habitat	Percent Sand and Fines	General WQS Criteria
	Stream Slope	
	Percent Canopy Cover	
	Channel Cross Section	

Appendix E
SLD Detection Limits and Laboratory Reporting Conventions

Tables 1-3 summarize the reporting conventions adopted by the Organic and Inorganic Chemistry Sections.

- Method Detection Limit (MDL) –The minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results (EPA 821-R-16-006, 2016).
- Minimum Reporting Level (MRL) - The lowest concentration at which an analyte can be detected in a sample and its concentration can be reported with a reasonable degree of accuracy and precision.
- Sample Detection Limit (SDL) – The sample specific detection limit; equal to (Dilution Factor x MDL (organics) or Dilution Factor x MRL (inorganics)).

Tables 1 and 2 summarize the detection and quantitation limit reporting for the Organic and Inorganic sections, respectively. The qualifiers and reporting conventions for the detection conditions of analytical results analyzed by the Organic and Inorganic Section of SLD, used by the SWQB are provided in Table 3.

Table 1. SLD Organic Section Detection and Quantitation Limits

SLD Section	Method Detection Limit (MDL)		Dilution Factor (DF)		Sample Detection Limit (SDL)		Method Reporting Limit (MRL)
Organic	MDL	x	DF	=	SDL	=	MRL

Table 2. SLD Inorganic Section Detection and Quantitation Limits

SLD Section	Method Reporting Limit (MRL)		Dilution Factor (DF)	Sample Detection Limit (SDL)
Air and Heavy Metals	MRL	X	DF	= SDL
Water Chemistry	MRL	X	DF	= SDL

Table 3. Detection Condition Qualifiers and Reporting Conventions

LABORATORY QUALIFIERS AND REPORTING CONVENTIONS				
Detection Condition	Criteria	Logical Response[(1)]	Qualifier	Reporting Convention
not detected at C ≥ SDL	C < SDL	TRUE	U	Report SDL
detected at C < SDL but >MDL	SDL > C >MDL	FALSE	J	Report estimated value
detected at C ≥ SDL	C ≥ SDL	FALSE	No Qualifier	Report value

C = analytical concentration

[(1)] Logical Question: Was the substance not detected at a concentration greater than or equal to the SDL?

Because "MDL" refers to a method detection limit and "SDL" incorporates both a quantitation factor and a sample-specific dilution factor, SWQB has requested that the Organics section assign "U" and "J" flags according to Table 13. The Inorganic sections report results as either positive values or <SDL. The SLD Inorganic sections use the MRL as a consistent reporting limit for a given analyte. The MRL is always greater than the MDL, which is instrument and operator-specific, by a factor that may range between 3 and 10.

The Radiochemistry section of SLD defines detection limit as the concentration of analyte that can be counted with a precision of plus or minus 100 % at the 95 % confidence level (1.96 σ , where σ (or sigma), is the standard deviation of the net counting rate of the sample) as referenced in 40 CFR 141.25(c). The Radiochemistry section notes that small negative or positive values less than 2 σ should be interpreted as "not detected," or less than the SDL. The Radiochemistry section reports results as either positive values or <SDL. Table 4 summarizes the detection and quantification limits for the Radiochemistry section. The qualifiers and reporting conventions for the detection conditions of analytical results analyzed by the Radiochemistry Section of SLD, used by the SWQB are provided in Table 5.

Table 4. Radiochemistry Detection and Quantitation Limits

SLD Section	Minimum Detection Limit (MDL)		Dilution Factor(DF)	Sample Detection Limit (SDL)
Radiochemistry Section	MDL*	X	DF	= SDL

* concentration of analyte that can be counted with a precision of plus or minus 100% at the 95% confidence level

Table 5. Radiochemistry Section Detection Condition Qualifiers and Reporting Conventions

Detection Condition	Criteria	Logical Response	Qualifier	Reporting Convention
not detected at C ≥ SDL	C < SDL	TRUE	U	Report SDL
detected at C ≥ SDL	C ≥ SDL	FALSE	No Qualifier	Report value

C = analytical concentration

Appendix F
Sample Handling Procedures and Holding Times

Sample Type	Sample Container	Preservation [1]	Maximum Holding Time[13]
Inorganic Tests			
Ions – full Suite[2] Ions – SWQB suite [3]	1-quart polyethylene cubitainer	On ice, approximately 6°C	7 days TSS – TDS 14 days other
TDS and TSS only	250 ml HDPE or 1 quart polyethylene cubitainer	On ice, approximately 6°C	7 days
Chloride	1-quart polyethylene cubitainer	None	28 days
Total Nutrients [4]	1-quart polyethylene cubitainer	1 mL H_2SO_4, on ice, approximately 6°C	28 days
Total Persulfate Nitrogen	250 ml HDPE or 1 quart polyethylene cubitainer	On ice, approximately 6°C or freeze	On ice: 7 days Frozen: 6 months
Dissolved Nutrients [5]	1-quart polyethylene cubitainer	Filtered (0.45□m) within 15 minutes of sample collection[14], 1 mL H_2SO_4, on ice, approximately 6°C	28 days
Cyanide [6]	1-quart polyethylene cubitainer	5-7 pellets NaOH, 0.6g ascorbic acid if chlorine present on ice, approximately 6°C	14 days
Hardness Ca + Mg	1-quart polyethylene cubitainer	1.8 mL H_2SO_4, on ice, approximately 6°C	180 days
Dissolved Organic Carbon (DOC)	8 oz amber glass bottle	Filtered (0.45□m) within 48 hours, ≥2 ml H_3PO_4 to pH≤2, on ice, approximately 6°C	28 days
Total Organic Carbon (TOC)	8 oz amber glass bottle	≥2 ml H_3PO_4 to pH≤2, on ice, approximately 6°C	28 days
Metals			
Total Metals [7]	1-quart polyethylene cubitainer	2.0. mL HNO_3,	28 days mercury – 6 months other
Total Recoverable Aluminum	1-quart polyethylene cubitainer	Turbidity <= 30 NTU: 2.0 mL HNO_3 Turbidity > 30 NTU: Filtered (10□m) within 15 minutes of sample collection[14], 2.0 mL HNO_3	6 Months
Dissolved Metals [8]	1-quart polyethylene cubitainer	Filtered (0.45□m) within 15 minutes of sample collection[14], 2.0 mL HNO_3	28 days mercury – 6 months other
Microbiological Tests			
: Total Coliform, and *E. coli* [9]	120-mL shrink-banded containers(IDEXX part number WB120SBST) 125-mL sterile polypropylene bottels(lab)	0.0008% $Na_2S_2O_3$, on ice, less than 10°C	8 hours for regulatory 24 hours for non-regulatory
Microbial Source Tracking (MST)	Dependent on laboratory	On ice, < 10°C	Dependent on project DQOs
Organic Tests [10]			
Method 8270 – Base/Neutral Acid Extractables [11]	Two 1-liter amber glass bottles (lab)	On ice, approximately 6°C	7 days until extraction, 40 days after extraction
Method 8260 – Volatile Organic Compounds [11]	Two 40-mL glass vials (lab) in Whirl-Pack	5 drops 10% HCl per vail (HCl provided by lab and prepared within 30 days of use), on ice, approximately 6°C	14 days
Microcystin	Two 40-mL glass vials (lab) in Whirl-Pack	0.0008% $Na_2S_2O_3$, on ice, less than 10°C	14 days
Radiological Tests			
Radionuclides [12]	Two 1-gallon polyethylene cubitainers	No preservative, store at room temperature	6 months
Biological Tests			
Ambient Toxicity (acute and chronic) in water and sediment	1-gallon polyethylene cubitainer (water) and/or Two 1-quart, wide-mouth glass containers (sediment)	On ice, approximately 6°C	36 hours

Sample Type	Sample Container	Preservation [1]	Maximum Holding Time[13]
Chlorophyll *a* (streams/rivers)	1-quart opaque container	Filter sample with Whatman GF/F or GF/C filters. Place filters in cooler with dry ice or store in cooler at 6°C or less and freeze no more than 12 hours after collection	28 Days.
Chlorophyll *a* (lakes)	1-quart opaque container.	Filter sample with Whatman GF/F or GF/C filters. Place Whatman filter in petri dish, wrap in foil , and place in cooler with dry ice and keep frozen.	28 Days if samples taken from a lake with pH ≥7
Phytoplankton (lakes)	1-quart polyethylene cubitainer	10-25 mL Acid Lugol's Solution within 2 hours of collection, on ice or refrigerated, approximately 6°C or less, in the dark	not applicable
Diatoms (lakes/streams/rivers)	glass or plastic vials, 45 mL	10 mL 95% ethanol or Lugol's Solution. On ice or refrigerated, approximately 6°C	not applicable
Periphyton community composition (streams/rivers)	50-mL plastic vial	2-4 mL of 10% formalin	not applicable
Macroinvertebrates	glass or polypropylene jar(s), size varies	fill jar with 95% ethanol; remove air bubbles	not applicable
Fish	Whirl-pack or equivalent	10% formalin to cover; remove air bubbles	not applicable
Fish Tissue	Filet and wrap in foil	Keep on ice and freeze	not applicable

Notes:

1 Preserve samples as soon as reasonably possible, preferably immediately after sample collection. Pre-preserved sample containers may be used.
2 Ions (full suite) include calcium, magnesium, potassium, sodium, hardness, alkalinity, bicarbonate, carbonate, sulfate, chloride, TDS, and TSS.
3 Ions (SWQB suite) include TDS, TSS, hardness, fluoride, chloride, and sulfate.
4 Total Nutrients include nitrate + nitrite, ammonia, total Kjeldahl nitrogen, and total phosphorus.
5 Dissolved nutrients include nitrate + nitrite, ammonia, orthophosphate, and dissolved phosphorus.
6 If chlorine or sulfide is suspected to be present, see SWQB SOPs for alternative handling procedures and holding times.
7 Total metals include aluminum, mercury and selenium at a minimum.
8 Dissolved metals include aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.
9 $Na_2S_2O_3$ is included in containers provided by IDEXX. If samples analyzed by SLD, contact SLD Environmental Microbiology regarding sample containers and schedule.
10 Various other organic analyses are available upon request. Refer to the SLD Organic Chemistry section (505 841-2571) or other contract labs for sample container, preservation and holding time information.
11 Refer to 40CFR136 for the list of parameters analyzed using methods 8270 and 8260.
12 Radionuclides generally include gross alpha/beta and Ra-226 + Ra-228.
13 Contact laboratory in advance of sampling to ensure that samples can be analyzed within the required holding times.
14 Or as soon as practically possible. In some cases, it may not be feasible to filter a sample within 15 minutes (e.g., remote sites). See EPA methods 200.7 and 200.8

Appendix G
Example IDEXX Quality Control Certificate

120mL Sterile Vessels w/Sodium Thiosulfate

QUALITY CONTROL CERTIFICATE

Product and Company Contact Information

Product Catalog Number: WV120SBST-200
Part Number: 98-09221-00
Lot Number: BY007V
Expiration date: 07 December 2026

Technical Support Inquiries:

1-207-556-4496
1-800-321-0207 (US/CAN)
00-800-4339-9111 (Europe)
Email: water@idexx.com

Manufactured for:

IDEXX Laboratories, Inc.
One IDEXX Drive
Westbrook, ME 04092 USA
Fax: 1-207-556-4630
idexx.com/water

Physical Properties

Fill Line Accuracy	Lot has been tested using the gravimetric method. The 100 mL fill line is accurate to within ± 2.0%, which meets critical volume requirements as presented in ISO 8199:2018, section 5.3.
Sterility	Lot has been irradiated. In accordance with ISO 11137-02, post-irradiated product has a minimum sterility assurance level (SAL) of 10^{-3}. No growth after 48 hours incubation at 35°C ± 0.5°C with sterile Tryptic Soy Broth.
Appearance	Absence of nicks, scratches, and cracks.
Sodium Thiosulfate Content	Lot is able to neutralize a 100 mL sample with up to 15 mg/L chlorine per *Standard Methods for the Examination of Water and Wastewater* section 9060A.2.
Fluorescence Test	Result: Pass

This product was performance tested and has met all quality control specifications required for release.
This information is released by IDEXX Quality Assurance:

Name: Justice Bowie, Quality Associate Sr I

Signature: 

frm-QA-093_C, CO #112883, Effective Date: 06/02/2019

Monday, January 15, 2024