NEW MEXICO ENVIRONMENT DEPARTMENT

Surface Water Quality Bureau
2025-2026 Lake Monitoring Survey
Middle Rio Grande and Canadian River/ Dry Cimarron River Watersheds

FIELD SAMPLING PLAN

3/31/2025

APPROVAL PAGE

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Surface Water Quality Bureau

Our mission is to preserve, protect, and improve New Mexico's surface water quality for present and future generations.

ACRONYMS

AU	Assessment Unit
BLM	Bureau of Land Management
CALM	Comprehensive Assessment and Listing Methodology
CWA	Clean Water Act
HUC	Hydrologic Unit Code (HUC)
EPA	Environmental Protection Agency
IR	State of New Mexico Clean Water Act §303(d)/305(b) Integrated Report
LTD	Long-term Deployment
MASS	Monitoring, Assessment, and Standards Section
MPG	Miles per gallon
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
NPS	Non-point Source
PCB	Polychlorinated biphenyl
PFAS	Perfluorinated and Polyfluorinated Alkyl Substances
PSRS	Point Source Regulation Section
QAO	SWQB Quality Assurance Officer
QAPP	Quality Assurance Project Plan
SLD	Scientific Laboratory Division
SOP	Standard Operating Procedure
SQUID	Surface Water Quality Information Database
SWQB	Surface Water Quality Bureau
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UAA	Use Attainability Analysis
USFWS	United States Forest Service
WPS	Watershed Protection Section
WQ	Water Quality
WQCC	Water Quality Control Commission
WQS	Water Quality Standards
WTUs	Work Time Units
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

The purpose of this Field Sampling Plan (Plan or FSP) is to provide a detailed description of the two-year Water Quality Survey to be conducted by the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB) on lakes in the 2025-2026 Middle Rio Grande Watershed and Canadian River / Dry Cimarron River Watershed survey areas. The NMED SWQB prepared this FSP in accordance with the most current SWQB *Standard Operating Procedure (SOP) 2.1 for Field Sampling Plan Development and Execution*. The Plan describes project objectives and decision criteria, and it includes the sampling schedule with locations, constituents, costs, and frequencies for physical, chemical, and biological data collection. It may be amended as the need arises. Amendments will be documented and justified in the subsequent survey report.

This is a companion document for the SWQB *Quality Assurance Project Plan for Water Quality Management Programs* (NMED/SWQB 2024a) (QAPP). Data will be collected according to the QAPP and the appropriate SWQB Standard Operating Procedures (SOPs). Both the QAPP and SOPs are posted on the SWQB website at https://www.env.nm.gov/surface-water-quality/qaqc/.

The lakes within this survey are located in the northeast portion of New Mexico, lying within Union, Colfax, Mora, Harding, Santa Fe, San Miguel, and Quay Counties, as well as Elephant Butte Reservoir and Caballo Reservoir in south central New Mexico in Sierra County. The project area (**Figure 1**) consists of publicly owned lakes and lake inlets. Historic and current land uses in the watersheds include ranching, silviculture, mining, recreation, and some urban and residential development. Land cover in the watersheds is composed of evergreen forest, shrub/scrubland, grassland, deciduous and mixed forest, and lotic waters and wetlands. Land ownership in the watersheds includes U.S. Forest Service, National Park Service, Bureau of Land Management (BLM), Tribal, U.S. Department of Defense, U.S. Fish and Wildlife Service, and State and Private parcels. This study will cover ten lakes or reservoirs located in Omnerick Level III Ecoregions 21 (Southern Rockies), 24 (Chihuahuan Deserts), and 26 (Southwestern Tablelands) (EPA 2006).

The NMED SWQB last monitored the lakes in these survey areas in 2015-2016 and identified both waters attaining New Mexico Water Quality Standards (WQS) and impaired waters (i.e., waters not attaining their specific designated uses). Streams within the watershed are divided into assessment units (AUs) based on differing geological and hydrological properties. Each AU is assessed individually using data from one or more monitoring sites located along the AU. Lakes are assigned a unique AU for each waterbody. For this survey, the NMED SWQB will sample selected monitoring locations for water quality constituents 2-4 times over two years, that also includes deployment of monitoring devices to gather long-term data sets and conduct physical habitat surveys where appropriate and warranted as resources allow. The total number of samples for each location is determined through a targeted monitoring plan for the Clean Water Act (CWA) §303(d)/ §305(b) Integrated Report (IR) classification, presence of point source discharge(s), and Total Maximum Daily Load (TMDL) status, among other considerations. The framework for monitoring prioritization is discussed in the SWQB Monitoring and Assessment Strategy (available at https://www.env.nm.gov/surface-water-quality/protocols-and-planning/) (NMED/SWQB 2016 or current version). The purpose of water quality sampling is to assess the quality of surface waters in the state, determine where water quality standards are not being met (i.e. waters are impaired), to inform development of Total Maximum Daily Loads (TMDLs) for impaired waters, and water quality standard criteria refinement, which lay the foundation for restoring and protecting surface water for the State of New Mexico. The type of monitoring planned at each site is discussed and summarized in **Section 5.0,** Sampling Plan.

Data are publicly available to interested parties through the U.S. Environmental Protection Agency (EPA) Water Quality Portal (https://www.waterqualitydata.us/) upon completion of data verification and validation.

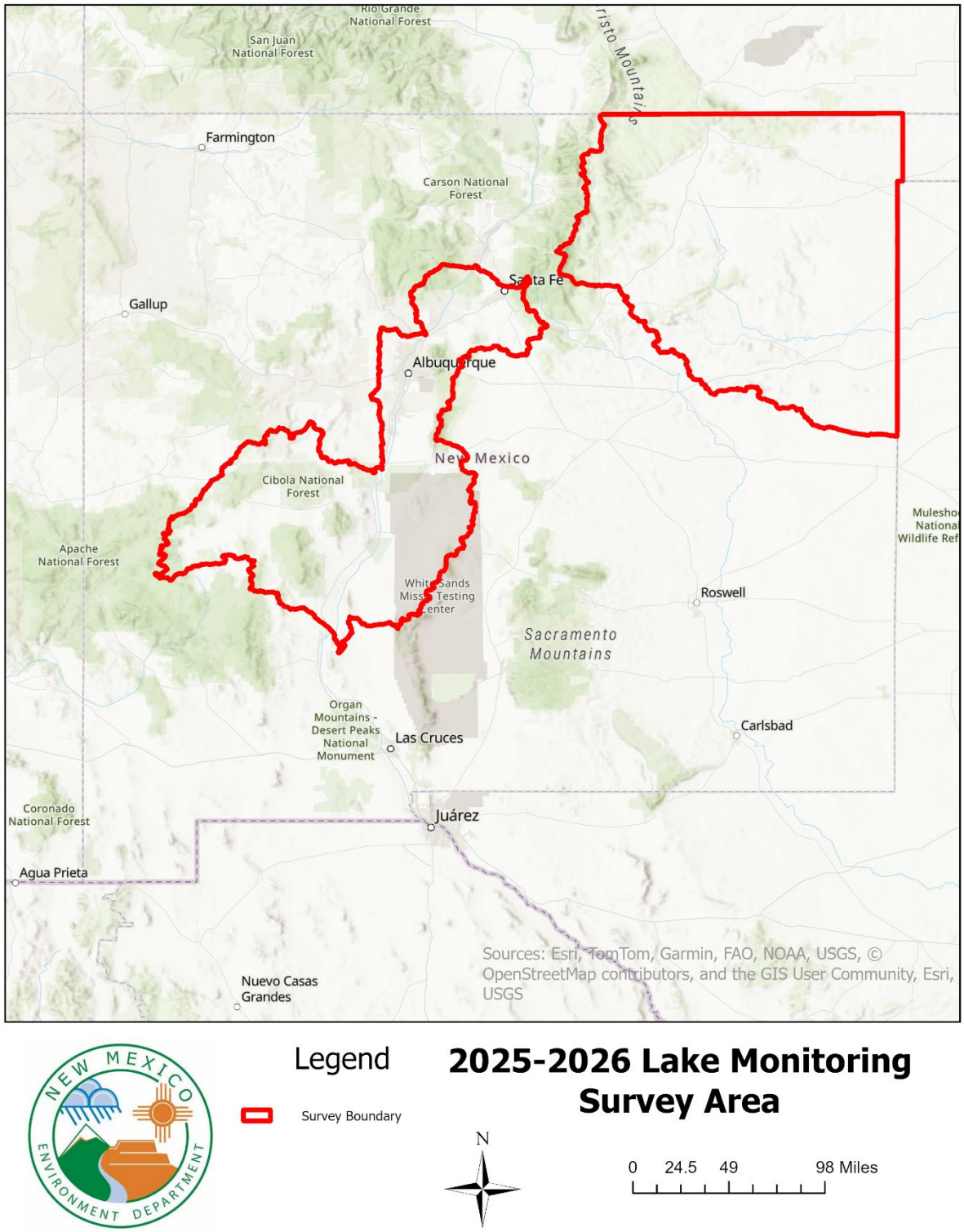


Figure 1. Lake Monitoring Survey Area

2.0 PROJECT PERSONNEL

2.1 Personnel Roles and Responsibilities

Table 1 details the responsibilities for this project. Each team member is responsible for implementing the assigned responsibilities. If individuals are unable to fulfill their duties, it is the individual's responsibility to find assistance and/or a replacement, in coordination with the appropriate Project Manager. Questions or comments on this FSP should be directed to the MASS Program Manager or Project Manager.

Table 1. Personnel Roles and Responsibilities

Team Member	Position/Role	Responsibilities
Lynette Guevara Monitoring, Assessment, and Standards Section Program Manager Lynette.Guevara@env.nm.gov 505-629-8811	Program Manager	Program Manager responsibilities noted in this FSP are completed in coordination with the Project Manager. Approve FSP, directs staff to publish the FSP according to program and/or grant requirements. Manage project personnel and resources throughout the project in coordination with Project Manager(s) and Project Team. Provide oversight and coordinate with Quality Assurance Officer (QAO) and Project Manager(s) on data collection activities not conducted in accordance with the FSP, QAPP, or current SOPs. Conduct environmental data collection activities in accordance with the developed FSP, QAPP, and current SWQB SOPs.

Team Member	Position/Role	Responsibilities
Miguel Montoya MASS Project Manager Miguel.Montoya@env.nm.gov 505-819-9882	Project Manager	Manage project resources throughout the project in coordination with Program Manager and Project Team. Conduct environmental data collection activities in accordance with the developed FSP, QAPP, and current SWQB SOPs. Data collection activities not conducted in accordance with the FSP, QAPP, or current SOPs will be documented and reported to the Program Manager and QAO. Conduct mid-survey meeting with team to discuss any changes to the project plan. Coordinate and conduct post-survey meeting with team to discuss differences between planned and actual sampling and what data gaps, if any, exist. Ensure the progress of project is kept on track by running SQUID reports and discussing on going data collection activities with Project Team. Write, coordinate, and assemble report and/or other grant deliverables required of the project.
Savannah Cutler Monitoring Team Scientist Savannah.Cutler@env.nm.gov 505-629-2443 Issac Martinez Monitoring Team Scientist Issac.Martinez@env.nm.gov 505-699-7101 Neal Denton Monitoring team Scientist Neal.Denton@env.nm.gov 505-531-7250 Hannah Burnham Monitoring team Scientist Hannah.Burnham@env.nm.gov 505-946-8808	Project Team	Conduct environmental data collection activities in accordance with the developed FSP, QAPP, and current SWQB SOPs. Data collection activities not conducted in accordance with the FSP, QAPP, or current SOPs will be documented and reported to the Project Manager. Maintain project files in dedicated survey folder. Calibration worksheets and field forms utilized for data collection will be maintained according to SOPs. Write assigned sections of reports and/or other grant deliverables required throughout the project.

Team Member	Position/Role	Responsibilities
Emily Miller Emilly.Miller@env.nm.gov 505-660-3534	Quality Assurance Officer (QAO)	Approve and ensure FSP is retained in accordance with 1.21.2 NMAC, Retention and Disposition of Public Records. Documents approved changes of FSP in QA project files. Conduct audits as needed to ensure compliance with FSP, QAPP and SOPs.
Michael Baca Michael.Baca1@env.nm.gov 505-946-8954	Standards Liaison	Provide information and data needs pertaining to water quality standards development and refinement located within the study area.
Heidi Henderson Heidi.Henderson@env.nm.gov 505-819-9986	TMDL and Assessment Team (TAT) Liaison	Provide information and data needs pertaining to TMDL development and assessment to be conducted in the study area.
Susan A. Lucas Kamat Susan.LucasKamat@env.nm.gov 505-946-8924	Point Source Regulation Section (PSRS) Liaison	Provide information and data needs pertaining to point source discharges located within the study area.
Kate Lacey Kathryn.Lacey@env.nm.gov 505-946-8952	Watershed Protection Section (WPS) Liaison	Provide information and data needs pertaining to nonpoint sources of pollution and BMPs located within the study area.
Maryann McGraw Maryann.McGraw@env.nm.gov 505-819-9891	Wetlands Program Liaison	Provide information and data needs pertaining to wetlands located within the study area.

2.2 Organization

The Project Team; Project Manager; Standards, Planning and Reporting Team Liaison; and TMDL and Assessment Team Liaison report to the MASS Program Manager for the responsibilities defined in this project. The Wetlands Program Liaison reports to the Watershed Protection Section (WPS) Program Manager. The Point Source Regulation Section (PSRS) Liaison and the WPS Liaison are section Program Managers and report to the SWQB Bureau Chief. An organizational chart of the SWQB is available at https://www.env.nm.gov/surface-water-quality/contact-us-3/.

3.0 PROJECT DESCRIPTION

3.1 Background

Section 303(d) of the Federal Water Pollution Control Act, known as the Clean Water Act (CWA), requires that each state submit to the U.S. Environmental Protection Agency (EPA) a list of water quality limited segments that require load allocations, waste load allocations, and TMDLs. The current CWA §303(d)

Program in New Mexico consists of three major steps: monitoring of surface waters, assessing monitoring data against the WQS, and developing TMDLs for those waters not meeting water quality standards (i.e., impaired).

CWA §305(b) requires that each state also submit a biennial report to the U.S. Congress through the EPA. The two requirements are combined into *The State of New Mexico §303(d)/§305(b) Integrated List and Report* (NMED/SWQB 2024b) (IR). The IR also serves as a source of basic information on water quality and water pollution control programs in New Mexico.

In accordance with the above stated statutory requirements, the IR report contains the following information:

- An assessment of surface water quality.
- An analysis of the extent to which the CWA §101(a) goal of surface water quality provides for protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water is being achieved.
- An overview of progress in water pollution control and recommendations for further action; and
- A description of the nature of nonpoint source pollution and of programs for nonpoint source control.

The activities described in this FSP are focused toward meeting the goals of the most recent, EPA-approved IR (NMED/SWQB 2024b). The impairments for AUs in this survey area listed in **Table 2** were identified during the SWQB's most recent survey of this watershed, conducted 2015-2016, and may include data from a variety of other investigations. The "IR Category" column provides the current AU's status in the IR (see **Appendix A** for definitions). "WQS Reference" provides the applicable Water Quality Standard reference as assigned to each AU and described in 20.6.4 New Mexico Administrative Code (NMAC) as governed by the New Mexico Water Quality Control Commission (WQCC) (NMAC 2022). The purpose of 20.6.4 NMAC is to establish WQS that consists of applicable designated uses of surface waters of the state, the water quality criteria necessary to protect those uses, and an antidegradation policy. The "TMDL Completed" column lists the EPA-approved TMDLs for the AU.

Assessment of surface waters against the WQS occurs after monitoring data have been verified and validated, using the most recent assessment protocols. Assessment protocols are updated every odd year (e.g., 2025, 2027) and are open for EPA and public review and comment. Waterbodies determined to be impaired are reported as such every even year (e.g., 2026, 2028) on New Mexico's IR List. TMDLs or TMDL alternatives are typically developed for impaired AUs on a priority basis.

Table 2. Lake Monitoring Survey: Impairment and TMDL Status of Survey Assessment Units

Assessment Unit Name	WQS Reference	IR Category	AU Current Impairments	TMDL(s) Completed
Caballo Reservoir	20.6.4.104	5/5A	Mercury - Fish Consumption Advisory |Nutrients	
Rio Grande (Caballo Reservoir to Elephant Butte Reservoir)	20.6.4.112	5/5C	Dissolved Oxygen	
Elephant Butte Reservoir	20.6.4.104	5/5C	Mercury - Fish Consumption Advisory |PCBS - Fish Consumption Advisory	

Assessment Unit Name	WQS Reference	IR Category	AU Current Impairments	TMDL(s) Completed
Rio Grande (Elephant Butte Rsvr to San Marcial at USGS)	20.6.4.105	5/5A	Aluminum, Total	
Morphy (Murphy) Lake	20.6.4.99	1		
Charette Lake (Lower)	20.6.4.308	5/5B	Temperature |Mercury - Fish Consumption Advisory	
Springer Lake	20.6.4.317	5/5C	Mercury - Fish Consumption Advisory	
Canadian R basin inlet/outlets, drains, canals, conveyances	Unclassified	N/A		
Eagle Nest Lake	20.6.4.315	5/5A	Nutrients	Plant Nutrients (2024)
Sixmile Creek (Eagle Nest Lake to headwaters)	20.6.4.309	4A	Escherichia Coli (E. Coli) |Turbidity |Temperature	E. coli (2004), Temperature (2010), Plant Nutrients (2010)
Cieneguilla Creek (Eagle Nest Lake to headwaters)	20.6.4.309	4A	Nutrients |Escherichia Coli (E. Coli) |Turbidity |Temperature |Sedimentation/Siltation	Turbidity (2004), SBD*(2004), Total Phosphorus (2010), Temperature (2010), E. coli (2010)
Moreno Creek (Eagle Nest Lake to headwaters)	20.6.4.309	4A	Temperature	Temperature (2010), Plant Nutrients (2010), Turbidity (2004)
Lake Maloya	20.6.4.312	5/5A	Nutrients	Plant Nutrients (2024)
Clayton Lake	20.6.4.316	5/5C	Nutrients |Mercury - Fish Consumption Advisory	
Seneca Creek (Perennial reaches abv Clayton Lake)	20.6.4.99	3/3A		
Canadian River (Conchas Reservoir to Mora River)	20.6.4.305	1		E. coli (2011)
Conchas Reservoir	20.6.4.304	5/5C	PCBS - Fish Consumption Advisory |Mercury - Fish Consumption Advisory	
Conchas River (Conchas Reservoir to Salitre Creek)	20.6.4.305	4A	Aluminum, Total |Escherichia Coli (E. Coli) |Nutrients	Chronic Aluminum (2019), E. coli (2019), Plant Nutrients (2019)
Ute Reservoir	20.6.4.302	5/5C	Mercury - Fish Consumption Advisory	
Ute Creek (Ute Reservoir to Bueyeros Creek)	20.6.4.98	3/3A		
Canadian River (Ute Reservoir to Conchas Reservoir)	20.6.4.303	5/5A	Temperature	E. coli (2011), Temperature (2019)
Pajarito Creek (Perennial prt Canadian R to Vigil Canyon)	20.6.4.303	4A	Temperature |Nutrients	Temperature (2019), Nutrients (2011), E. coli (2011)

NOTES: * Stream Bottom Deposits (now referred to as “Sedimentation/Siltation”)

3.2 Objectives

Table 3 outlines the project objectives identified to meet the various SWQB needs. Data needs have been determined based on core parameters needed to complete assessments according to the Comprehensive Assessment and Listing Methodology (CALM), impairments from previous studies, identified data gaps, and consultation with the SWQB MASS, PSRS, and WPS staff as well as other state agencies, federal agencies, tribes, local watershed groups, and interested parties.

Table 3. Project Objectives

Purpose for Water Quality Data Collection	Question to be answered	Decision Criteria	Products/ Outcomes
Assess designated use attainment for the *Integrated Report* and provide information to the public on the condition of surface waters	Are sampled waterbodies meeting WQS criteria?	WQS criteria interpreted through the CALM	Integrated Report
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 criteria and critical flow volume	TMDL loading calculations and NPDES permit limits
Evaluate restoration and mitigation measures implemented to control NPS pollution	Have watershed restoration activities and mitigation measures improved water quality?	WQS criteria and historic data	Project Summary Reports, NPS Annual Report, *Integrated Report (De-Listing)*
Develop or refine the WQS	Are the existing uses appropriate for the waterbody?	Data sufficient to support a petition to the WQCC to revise WQS	Use Attainability Analysis (UAA); Site Specific Criteria; Amendments to WQS
Obtain data for ambient/baseline water quality upstream of NPDES outfall	What is the water quality above the NPDES outfall?	Survey chemical, physical and biological data	NPDES Permits / Certifications

3.3 Monitoring Strategy

The SWQB monitoring of surface waters across the State currently occurs, on average, every six years using a rotational watershed sampling approach. Monitoring occurs during the non-winter months from March through November and focuses on physical, chemical, and biological conditions, mostly in perennial waters, including sampling for most pollutants that have numeric and/or narrative criteria in the WQS.

To achieve the goals outlined in Section 3.2, the NMED SWQB utilized a targeted monitoring design to address data needs identified for assessment, previous impairments, TMDLs, potential standards revisions, WPS restoration activities and point source monitoring. Monitoring sites were selected based on the data needs for an assessment unit, accessibility, and representation of and within the assessment unit. Each assessment unit is represented by one or more monitoring stations, each of which receives 2–4 site visits during the survey.

3.4 Project Schedule

As part of the survey planning process, the NMED SWQB holds a 30-day public comment period to solicit input on any areas of concern within the AUs surveyed and to inform interested parties about the SWQB water quality survey process, the specific sampling plans in the watershed, and the assessment and TMDL processes.

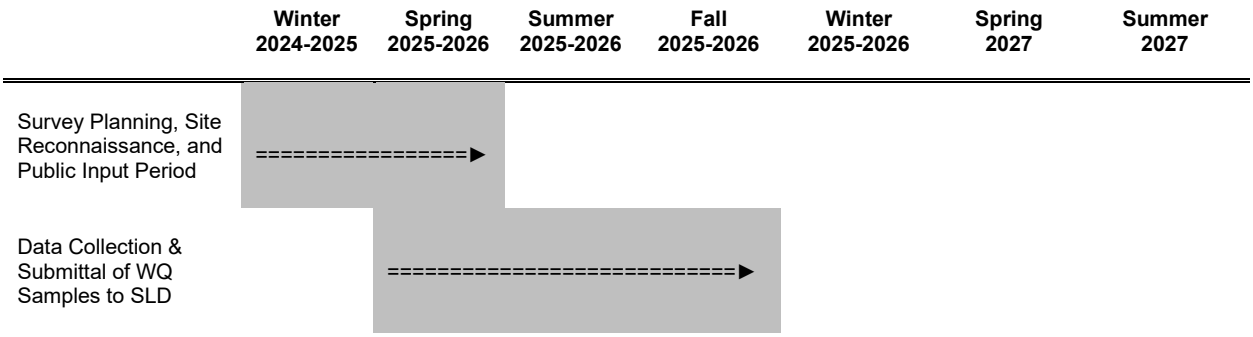
For this survey, the NMED SWQB held a virtual public meeting in March 2025, and considered information received from the public input process to finalize the FSP.

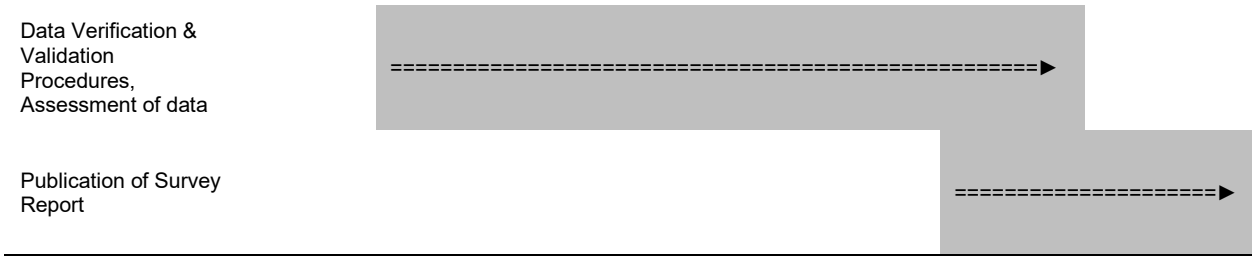
The NMED SWQB will document the progress of this project and track it from inception through implementation to ensure all sampling and analytical activities are performed in accordance with all applicable requirements and in a cost-effective manner. **Table 4** provides the project timeline.

Water chemistry results typically take several months to return from the analytical laboratory, the New Mexico Scientific Laboratory Division (SLD) and other contract laboratories. The NMED SWQB has incorporated the lag time to receive results into the schedule. When sample results are received, they undergo verification and validation according to SWQB SOPs. The final step of the project is the publication of a survey report on the SWQB website that summarizes the data collection effort and documents changes to the original and revised FSP. The final survey report will be made available at: https://www.env.nm.gov/surface-water-quality/water-quality-monitoring/.

Following project completion, the data will be assessed for incorporation into the 2026-2028 IR List. Once the assessments are complete, the TMDL development process will begin for any identified impairments.

Table 4. Project Schedule





3.5 Project Location

The project area consists of the perennial tributaries and lakes within the Elephant Butte Reservoir watershed (HUC 13020211), Caballo watershed (HUC 13030101), Rio Grande-Santa Fe watershed (13020201), Upper Canadian-Ute Reservoir watershed (HUC 11080006), Ute watershed (HUC 11080007), Conchas Watershed (HUC 11080005), Upper Canadian watershed (HUC 11080003), Upper Beaver watershed (HUC 11100101), Canadian Headwaters watershed (HUC 11080001), Cimarron watershed (HUC 11080002), and Mora watershed (HUC 11080004). **Table 5** shows a complete list of stations illustrated in **Figure 2 and Figure 3**.

Table 5. Lake Monitoring: Water Quality Stations

Map #	Station Name	Station ID	Assessment Unit	Station Rationale
1	CABALLO LAKE AT DAM DEEP - 41CaballoLkDam	41CaballoLkDam	Caballo Reservoir	Lake station
2	Canadian River at NM 104 at mile marker 88 - 09Canadi144.5	09Canadi144.5	Canadian River (Ute Reservoir to Conchas Reservoir)	Lake inlet station
3	Canadian River at NM 419 near Sanchez - 06Canadi232.6	06Canadi232.6	Canadian River (Conchas Reservoir to Mora River)	Lake inlet station
4	Cieneguilla Creek above Eagle Nest Lake	05Cieneg006.3	Cieneguilla Creek (Eagle Nest Lake to headwaters)	Lake inlet station
5	CLAYTON LAKE DEEP DAM - 16ClaytonDeep	16ClaytonDeep	Clayton Lake	Lake station
6	CONCHAS RESERVOIR NR DAM - 08ConResNrDam	08ConResNrDam	Conchas Reservoir	Lake inlet station
7	Conchas River @ NM 104 - 08Concha028.0	08Concha028.0	Conchas River (Conchas Reservoir to Salitre Creek)	Lake inlet station
8	E BUTTE AT DAM - 40EButteReDam	40EButteReDam	Elephant Butte Reservoir	Lake station
9	Eagle Nest Lake (Deep)	05EagleNestDP	Eagle Nest Lake	Lake station
10	Lake Maloya (Deep)	04LMaloyaDeep	Lake Maloya	Lake station
11	Lake Maloya Inlet at Chicorica Creek	04LMaloChicIn	Canadian R basin inlet/outlets, drains, canals, conveyances	Lake inlet station

Map #	Station Name	Station ID	Assessment Unit	Station Rationale
12	Lake Maloya Inlet at Schwachheim Creek	04LMaloSchwIn	Canadian R basin inlet/outlets, drains, canals, conveyances	Lake inlet station
13	Lower Charette Lake	06LoCharetteD	Charette Lake (Lower)	Lake station
14	Lower Charette Lake Inlet - 06LoCharInlet	06LoCharInlet	Charette Lake (Lower)	Lake inlet station
15	Moreno Creek at US 64	05Moreno003.7	Moreno Creek (Eagle Nest Lake to headwaters)	Lake inlet station
16	Morphy Lake 1.8 M FROM E SHORE, CENTERED TO DAM - 07MorphyLake2	07MorphyLake2	Morphy (Murphy) Lake	Lake station
17	Morphy Lake Inlet - 07MorphyInlet	07MorphyInlet	Canadian R basin inlet/outlets, drains, canals, conveyances	Lake inlet station
18	Pajarito Creek at NM 104 - 09Pajari020.0	09Pajari020.0	Pajarito Creek (Perennial prt Canadian R to Vigil Canyon)	Lake inlet station
19	RIO GRANDE ABOVE CABALLO LAKE - 41RGrand196.6	41RGrand196.6	Rio Grande (Caballo Reservoir to Elephant Butte Reservoir)	Lake inlet station
20	Rio Grande above Elephant Butte - 40RGrand254.7	40RGrand254.7	Rio Grande (Elephant Butte Rsvr to San Marcial at USGS)	Lake inlet station
21	Seneca Creek above Clayton Lake - 16Seneca043.0	16Seneca043.0	Seneca Creek (Perennial reaches abv Clayton Lake)	Lake inlet station
22	Sixmile Creek at US 64	05Sixmil001.4	Sixmile Creek (Eagle Nest Lake to headwaters)	Lake inlet station
23	Springer Lake (Deep)	05SpringerLDp	Springer Lake	Lake station
24	UTE CREEK NEAR LOGAN, N. MEX. - 10UteCre007.5	10UteCre007.5	Ute Creek (Ute Reservoir to Bueyeros Creek)	Lake inlet station
25	UTE RESERVOIR NEAR DAM - 09UteResNrDam	09UteResNrDam	Ute Reservoir	Lake station

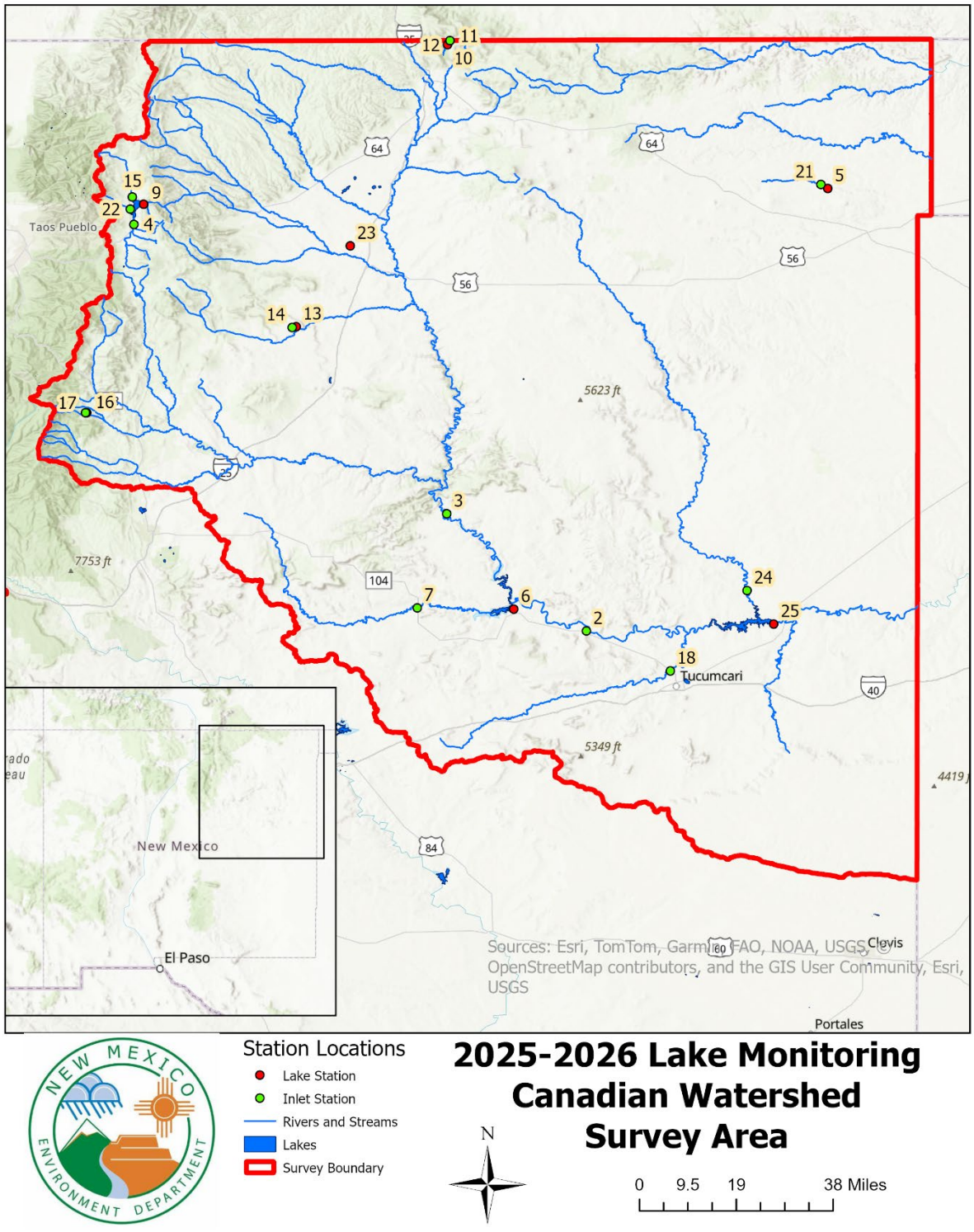


Figure 2. Northern Lake Monitoring Area and Monitoring Locations

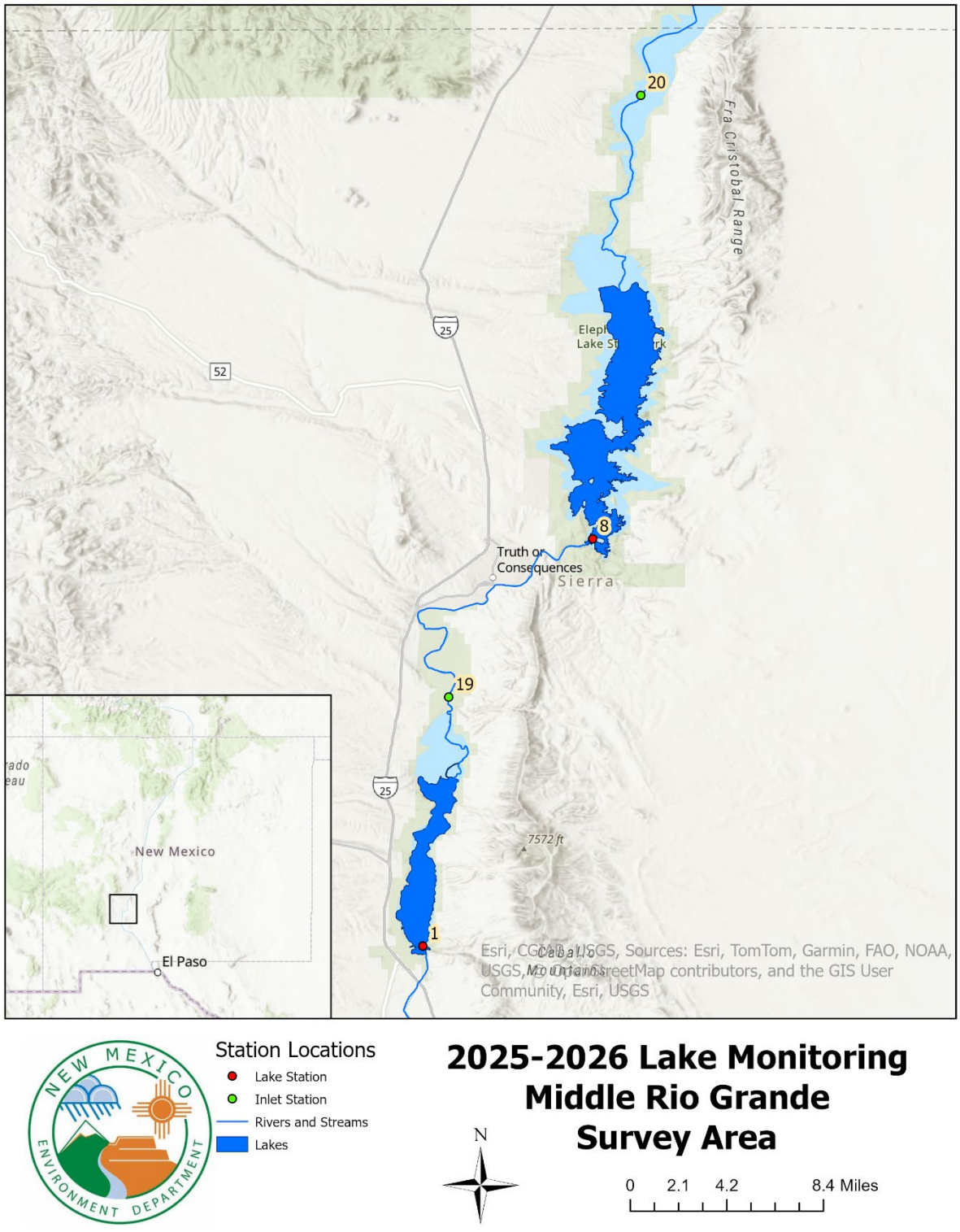


Figure 3. Southern Lake Monitoring Area and Monitoring Locations

4.0 DOCUMENTATION

Project documents will include this field sampling plan, field sheets (including chemistry, bio habitat, probable source observations and data logger deployment/retrieval sheets), calibration records, electronic data logger downloads, data validation and verification records, sample collection data, lab submittal forms, and records of analytical data in hard copy or in electronic form.

Documents will be maintained in accordance with the requirements of the SWQB QAPP for Water Quality Management Programs (NMED/SWQB 2024a).

The survey data will be organized within the following project folder in the SWQB database:

- Lake Monitoring Survey 2025-2026: Middle Rio Grande and Canadian River/ Dry Cimarron River Watersheds

The NMED SWQB will document project activities on SWQB Monitoring Field Sheets and enter and maintain information from field sheets in the SWQB database in accordance with the SWQB QAPP and SOPs. Analytical results will be electronically transferred into the SWQB database and uploaded to US EPA'S Water Quality Exchange (WQX) database upon completion of verification and validation of data. The project is completed once the Survey Report is finalized, after data has been verified and validated.

Narrative descriptions of progress, any plan deviations, issues, or corrective actions throughout the project will be documented in the mid-survey revised FSP and Final Survey Report. Any deviations from SOPs and other field, laboratory, and data analysis practices will be presented to the MASS Program Manager, Monitoring Team Supervisor and the Quality Assurance Officer for consideration and approval.

5.0 SAMPLING PLAN

5.1 Chemistry Sampling

Sample collection techniques, preservation and acidification requirements, equipment, and quality control activities associated with the sampling of surface water for analytes listed in **Table 6** will be conducted in accordance with the most current SWQB SOP 8.1 Chemical Sampling – Equipment Cleaning Procedure, SOP 8.2 Chemical Sampling in Lotic Environments, SOP 9.1 Bacteriological Sampling, SOP 12.1 Lake Sampling and QAPP (NMED/SWQB 2024a).

Water quality samples will be analyzed by the SLD, the SWQB laboratory, or contract laboratory in accordance with procedures outlined in the SWQB SOPs. Nutrient samples where high phosphorus levels are expected, such as WWTPs, will be analyzed using a method with a higher reporting limit.

Table 6 outlines the water quality analytes to be measured and their sampling frequency. The numbers listed within the analyte columns describe the number of samples planned for applicable analytes at each station during the 2025-2026 survey. The footnotes to **Table 6** contain more detailed information regarding chemical analytical suites.

Chemistry sample analytical suites for each station are planned based on the data needs identified for each assessment unit and to address the most common sources of impairment in lakes and streams. Due to limited resources, not all the water quality criteria listed in 20.6.4.900 NMAC will be sampled at all

stations. Radionuclides and volatile/semi-volatile organic compounds may be sampled in major tributaries, above and below NPDES permit discharges, and lakes. PCBs will be monitored in fish tissue on priority lakes in cooperation with the New Mexico Department of Game and Fish under the SWQB Fish Consumption Advisory Program as resources allow. PFAS sampling is also planned at surface water locations that may be relevant to drinking water intake sources, pending sufficient funding, resources, and dependent on laboratory.

In addition to the analytes listed, instantaneous measurements for field parameters such as temperature, specific conductance, salinity, dissolved oxygen concentration, dissolved oxygen saturation, pH, and turbidity will be measured at each monitoring site using an In-Situ® multi-parameter sonde (or equivalent) in accordance with the most current version of SWQB SOP 6.1 Sondes and SOP 12.1 Lake Sampling.

Table 6. Lake Monitoring Survey: Water Chemistry Sampling Frequency

Map #	Station Name	Station ID	Assessment Unit	TDS/TSS[1]	Nutrients (low P)[2]	Total Metals[3]	Dissolved Metals[4,7]	E. coli[10]	Total Organic Carbon	Dissolved Organic Carbon[7]	Volatile Organics[5,8]	Semi-Volatile Organics[5]	Radionuclides[6]	PFAS[5,9]
1	CABALLO LAKE AT DAM DEEP - 41CaballoLkDam	41CaballoLkDam	Caballo Reservoir	3	3	3	3	3	3	3	3	3	3	
2	Canadian River at NM 104 at mile marker 88 - 09Canadi144.5	09Canadi144.5	Canadian River (Ute Reservoir to Conchas Reservoir)	4	4	4	4	4	4	4				
3	Canadian River at NM 419 near Sanchez - 06Canadi232.6	06Canadi232.6	Canadian River (Conchas Reservoir to Mora River)	4	4	4	4	4	4	4				
4	Cieneguilla Creek above Eagle Nest Lake	05Cieneg006.3	Cieneguilla Creek (Eagle Nest Lake to headwaters)	4	4	4	4	4	4	4				
5	CLAYTON LAKE DEEP DAM - 16ClaytonDeep	16ClaytonDeep	Clayton Lake	2	2	2	2	2	2	2				
6	CONCHAS RESERVOIR NR DAM - 08ConResNrDam	08ConResNrDam	Conchas Reservoir	3	3	3	3	3	3	3	3	3	3	
7	Conchas River @ NM 104 - 08Concha028.0	08Concha028.0	Conchas River (Conchas Reservoir to Salitre Creek)	4	4	4	4	4	4	4				
8	E BUTTE AT DAM - 40EButteReDam	40EButteReDam	Elephant Butte Reservoir	3	3	3	3	3	3	3	3	3	3	
9	Eagle Nest Lake (Deep)	05EagleNestDP	Eagle Nest Lake	3	3	3	3	3	3	3	3	3	3	
10	Lake Maloya (Deep)	04LMaloyaDeep	Lake Maloya	2	2	2	2	2	2	2	2	2	2	2
11	Lake Maloya Inlet at Chicorica Creek	04LMaloChicIn	Canadian R basin inlet/outlets, drains, canals, conveyances	4	4	4	4	4	4	4				
12	Lake Maloya Inlet at Schwachheim Creek	04LMaloSchwIn	Canadian R basin inlet/outlets, drains, canals, conveyances	4	4	4	4	4	4	4				
13	Lower Charette Lake	06LoCharetteD	Charette Lake (Lower)	2	2	2	2	2	2	2				

Map #	Station Name	Station ID	Assessment Unit	TDS/TSS2[1]	Nutrients (low P)[2]	Total Metals[3]	Dissolved Metals[4,7]	E. coli[10]	Total Organic Carbon	Dissolved Organic Carbon[7]	Volatile Organics[5,8]	Semi-Volatile Organics[5]	Radionuclides[6]	PFAS[5,9]
14	Lower Charette Lake Inlet - 06LoCharInlet	06LoCharInlet	Charette Lake (Lower)	4	4	4	4	4	4	4				
15	Moreno Creek at US 64	05Moreno003.7	Moreno Creek (Eagle Nest Lake to headwaters)	4	4	4	4	4	4	4				
16	Morphy Lake 1.8 M FROM E SHORE, CENTERED TO DAM - 07MorphyLake2	07MorphyLake2	Morphy (Murphy) Lake	2	2	2	2	2	2	2				
17	Morphy Lake Inlet - 07MorphyInlet	07MorphyInlet	Canadian R basin inlet/outlets, drains, canals, conveyances	4	4	4	4	4	4	4				
18	Pajarito Creek at NM 104 - 09Pajari020.0	09Pajari020.0	Pajarito Creek (Perennial prt Canadian R to Vigil Canyon)	4	4	4	4	4	4	4				
19	RIO GRANDE ABOVE CABALLO LAKE - 41RGrand196.6	41RGrand196.6	Rio Grande (Caballo Reservoir to Elephant Butte Reservoir)	4	4	4	4	4	4	4				
20	Rio Grande above Elephant Butte - 40RGrand254.7	40RGrand254.7	Rio Grande (Elephant Butte Rsvr to San Marcial at USGS)	4	4	4	4	4	4	4				
21	Seneca Creek above Clayton Lake - 16Seneca043.0	16Seneca043.0	Seneca Creek (Perennial reaches abv Clayton Lake)	4	4	4	4	4	4	4				
22	Sixmile Creek at US 64	05Sixmil001.4	Sixmile Creek (Eagle Nest Lake to headwaters)	4	4	4	4	4	4	4				
23	Springer Lake (Deep)	05SpringerLDp	Springer Lake	2	2	2	2	2	2	2				
24	UTE CREEK NEAR LOGAN, N. MEX. - 10UteCre007.5	10UteCre007.5	Ute Creek (Ute Reservoir to Bueyeros Creek)	4	4	4	4	4	4	4				
25	UTE RESERVOIR NEAR DAM - 09UteResNrDam	09UteResNrDam	Ute Reservoir	3	3	3	3	3	3	3	3	3	3	
Total Number of Sampling Events				85	85	85	85	85	85	85	17	17	17	2

NOTES:

[1] Asterisk (*) next to station indicates TDS/TSS/Cl-/SO4 will be collected due to water quality standards for sulfate and chloride.

[2] Suite includes total Kjeldahl nitrogen, nitrate + nitrite, ammonia, and total phosphorus.

[3]Suite includes aluminum, mercury, and selenium.

[4]Suite includes aluminum, antimony, arsenic, barium, boron, beryllium, calcium, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, mercury, magnesium, nickel, selenium, silicon, silver, thallium, tin, uranium, vanadium, and zinc.

[5]A complete list of analytes are listed in Appendix B, which may change based on laboratory capabilities

[6]A radionuclide sample will include gross alpha and gross beta. If alpha and/or beta particles are detected, Uranium mass and Radium 226 + 228 will also be analyzed.

[7]Equpment blank will be collected at a frequency of at least 10% of the environmental samples collected; one equipment blank per ten environmental samples to allow for QC blank distribution. See SOP 8.2 for Chemical Sampling in Lotic Environments.

[8] A trip blank in accordance with SOP 8.2 for Chemical Sampling in Lotic Environments.

[9]A blank must be collected in accordance with SOP 8.4 for PFAS.

[10]A blank will be collected at a frequency of at least 10% of the environmental samples collected; one blank sample per ten environmental samples to allow for QC blank distribution. See SOP 8.2 for Chemical Sampling in Lotic Environments.

5.2 Physical Habitat, Biological Sampling, and Datalogger Deployment

Measuring biological response indicators (fish, macroinvertebrates, and phytoplankton) concurrent to physical habitat measurements and chemistry gives an overall interpretation of the biological integrity of the reach represented. These data also provide further information such as characteristics of sediment and nutrients currently cycling through the stream and potential sources of water quality stress.

The SWQB currently collects fish, periphyton, macroinvertebrates and physical habitat data at select sites to assess waterbodies for potential impairment from increased temperatures, sediment deposition, nutrient enrichment, and toxic pollutants.

Sampling methods will be conducted in accordance with the SWQB SOPs. Fish data will be collected in accordance with the most current SOP 11.4 Fish Community Sampling. Macroinvertebrate sampling will be conducted in accordance with SOP 11.2 Benthic Macroinvertebrates. Biological sampling will be conducted within a biological index period for appropriate comparability of samples and life history requirements. Physical habitat data will be collected in accordance with SOP 5.0 Physical Habitat Measurements. Chlorophyll *a* and microcystin will be collected in accordance with SOP 12.1 Lake Sampling.

Sondes and data loggers will be deployed at select sites in the stream according to the most up to date CALM to record specific conductance, dissolved oxygen, turbidity, or pH fluctuations. For more information on minimum deployment intervals needed to complete the assessment for specific parameters, please refer to the most up to date CALM (NMED/SWQB or most current version). Thermographs (water temperature data loggers) are generally deployed from May through September in targeted AUs throughout the survey to measure temperature fluctuations. Thermographs will be deployed in accordance with the most up to date SOP 6.3 Temperature data loggers.

Resources, site access, and other issues do not allow for the deployment of datalogging instruments or collection of biological and habitat data at every AU. Stations are selected for biological and physical habitat monitoring based on 1) current IR status, 2) results from nutrient, sediment, and temperature data, 3) observations of the surrounding land use including upland and riparian habitat conditions, and observation of probable source(s). Additional sites determined to be in “reference”, or “best available condition” will also be selected for biological and physical monitoring for inclusion in development and refinement of biological and habitat criteria when resources allow. **Table 7** summarizes long-term deployments of data loggers, biological, and habitat sampling planned for this survey. The numbers listed within **Table 7** describe the number of data collection events planned for each station during the 2025-2026 survey.

Sonde/DO/conductivity logger deployments described in **Table 7** are planned in accordance with the data requirements identified in the CALM (NMED/SWQB 2023a or most current).

Table 7. Lake Monitoring Survey: LTD, Biological, and Habitat Sampling

Map #	Station Name	Station ID	Assessment Unit	Sonde/DO/Cond[1,2]	Thermograph	Flow[3]	Physical Habitat	Chlorophyll a[4]	Zooplankton	Phytoplankton	Microcystins
1	CABALLO LAKE AT DAM DEEP - 41CaballoLkDam	41CaballoLkDam	Caballo Reservoir					3	3	3	3
2	Canadian River at NM 104 at milemarker 88 - 09Canadi144.5	09Canadi144.5	Canadian River (Ute Reservoir to Conchas Reservoir)		1	4					
3	Canadian River at NM 419 near Sanchez - 06Canadi232.6	06Canadi232.6	Canadian River (Conchas Reservoir to Mora River)			4					
4	Cieneguilla Creek above Eagle Nest Lake	05Cieneg006.3	Cieneguilla Creek (Eagle Nest Lake to headwaters)	S	1	4	1				
5	CLAYTON LAKE DEEP DAM - 16ClaytonDeep	16ClaytonDeep	Clayton Lake					2	2	2	2
6	CONCHAS RESERVOIR NR RATTLESNAKE - 08ConResNrRat	08ConResNrRat	Conchas Reservoir					3	3	3	3
7	Conchas River @ NM 104 - 08Concha028.0	08Concha028.0	Conchas River (Conchas Reservoir to Salitre Creek)	D		4					
8	E BUTTE AT DAM - 40EButteReDam	40EButteReDam	Elephant Butte Reservoir					3	3	3	3
9	Eagle Nest Lake (Deep)	05EagleNestDP	Eagle Nest Lake					3	3	3	3
10	Lake Maloya (Deep)	04LMaloyaDeep	Lake Maloya					2	2	2	2
11	Lake Maloya Inlet at Chicorica Creek	04LMaloChicIn	Canadian R basin inlet/outlets, drains, canals, conveyances			4					
12	Lake Maloya Inlet at Schwachheim Creek	04LMaloSchwIn	Canadian R basin inlet/outlets, drains, canals, conveyances			4					
13	Lower Charette Lake	06LoCharetteD	Charette Lake (Lower)					2	2	2	2
14	Lower Charette Lake Inlet - 06LoCharInlet	06LoCharInlet	Charette Lake (Lower)		1	4					
15	Moreno Creek at US 64	05Moreno003.7	Moreno Creek (Eagle Nest Lake to headwaters)		1	4					
16	Morphy Lake 1.8 M FROM E SHORE, CENTERED TO DAM - 07MorphyLake2	07MorphyLake2	Morphy (Murphy) Lake					2	2	2	2

Map #	Station Name	Station ID	Assessment Unit	Sonde/DO/Cond[1,2]	Thermograph	Flow[3]	Physical Habitat	Chlorophyll a[4]	Zooplankton	Phytoplankton	Microcystins
17	Morphy Lake Inlet - 07MorphyInlet	07MorphyInlet	Canadian R basin inlet/outlets, drains, canals, conveyances			4					
18	Pajarito Creek at NM 104 - 09Pajari020.0	09Pajari020.0	Pajarito Creek (Perennial prt Canadian R to Vigil Canyon)	D	1	4					
19	RIO GRANDE ABOVE CABALLO LAKE - 41RGrand196.6	41RGrand196.6	Rio Grande (Caballo Reservoir to Elephant Butte Reservoir)	D		4					
20	Rio Grande above Elephant Butte - 40RGrand254.7	40RGrand254.7	Rio Grande (Elephant Butte Rsvr to San Marcial at USGS)			4					
21	Seneca Creek above Clayton Lake - 16Seneca043.0	16Seneca043.0	Seneca Creek (Perennial reaches abv Clayton Lake)			4					
22	Sixmile Creek at US 64	05Sixmil001.4	Sixmile Creek (Eagle Nest Lake to headwaters)	S	1	4	1				
23	Springer Lake (Deep)	05SpringerLDp	Springer Lake					2	2	2	2
24	UTE CREEK NEAR LOGAN, N. MEX. - 10UteCre007.5	10UteCre007.5	Ute Creek (Ute Reservoir to Bueyeros Creek)			4					
25	UTE RESERVOIR NEAR DAM - 09UteResNrDam	09UteResNrDam	Ute Reservoir					3	3	3	3
Total Number of Sampling Events				5	6	60	2	25	25	25	25

NOTES:

[1] Multiparameter sondes and/or dissolved oxygen (DO) loggers are deployed at sites that indicate elevated turbidity or nutrient enrichment or have been previously listed for turbidity or nutrients. Conductivity loggers are deployed to measure specific conductance over time in streams of concern.

[2] Logger types: S (sonde), D (DO logger), or C (conductivity logger)

[3] Flow, water quality and temperature data will be used from USGS gages where possible.

[4] Chlorophyll-a samples are collected at lake monitoring locations.

6.0 RESOURCE REQUIREMENTS

Sample analysis costs include: SLD work-time units (WTUs) for chemical analysis performed at SLD and provided to the SWQB through a Joint Powers Agreement between the State agencies; analysis costs for chemical and biological samples sent to contract laboratories are listed in dollars; as well as equipment costs for *E. coli* analysis performed by qualified SWQB staff. Sample analysis expenses are summarized in **Table 8**.

Approximate monthly fuel expenses are summarized in **Table 9**. Vehicles will require standard preventative maintenance, and unforeseen costs may arise at any time.

Water quality sampling trips will require two staff. Habitat surveys will require two to three staff surveying one to two sites per day. Biological survey crew maximum requirements are three staff surveying one to three sites per day. Staff field days and per diem costs are summarized in **Table 10**. Staff receive $166 per night per diem for travel costs. Costs not included below may involve general sampling supplies such as water quality sample containers and preservatives, sonde calibration solutions, and periphyton, macroinvertebrate, fish, chlorophyll a, microcystins, zooplankton and habitat sampling/monitoring equipment. Total costs for the survey are summarized in **Table 11**.

Table 8. Biological and Chemical Cost Summary for the Lake Monitoring Survey

Analyte	Total # of Samples	Cost per Sample (WTU unless indicated in $)	Total Expenditure (WTU unless indicated in $)
TDS/TSS2	85	45	3735
Nutrients (low P)	85	95	7885
Total Metals	85	185	15355
Dissolved Metals	85	140	11620
TOC	85	30	2490
DOC	85	30	2490
Volatile Organics	17	150	2550
Semi-Volatile Organics	17	235	3995
Radionuclides9	17	610	10370
E. coli	85	$8.58	$712.14
PFAS EPA Method 537.1	4	$235.00	$470.00
Chlorophyll a	25	$55.00	$1,375.00
Zooplankton	25	$150.00	$3,750.00
Phytoplankton	25	$150.00	$3,750.00
Microcystins	25	$150.00	$3,750.00
Totals		WTUs	61,540
		Dollar	$13,824.30

Table 9. Vehicle Costs for the Lake Monitoring Survey

Month	Approximate Miles	Estimated MPG	Estimated Cost of Gasoline per Gallon	Total Fuel Costs
June	750	15	$2.92	$146.00
July	750	15	$2.92	$146.00
August	750	15	$2.92	$146.00
September	750	15	$2.92	$146.00
TOTAL				$584.00

Table 10. Field Staff Days and Per Diem Costs for the Lake Monitoring Survey

Expense	Water Chemistry Surveys	Biological and Habitat Surveys	Data Logger Deployments	Per diem rate	Total
Per Diem (number of nights out per year)	32	0	3	$166	$5,810

Field Staff Days (number of days per year)	48	2	6		56

Table 11. Total Cost Estimates for the Sacramento Mountains Survey

WTUs	Contract Labs $	Supplies $	Fuel $	Per Diem $	Staff Field Days
61,540	$13,824.30	$3,422.50	$584.00	$5,810	56

7.0 REPORTING

Following completion of the survey and verification and validation of all data collected during the project (following the most current version of SWQB SOP 15.0 Verification and Validation), a final survey report will be produced in April 2027 that summarizes the data collected during the survey and describes any deviations from the original or amended FSP. Progress during the survey will be documented in biannual progress reports to EPA for the CWA 106 grant. Other reports and documents that may use information collected during this survey include TMDL reports, proposals for water quality standards revision, and/or NPDES permits.

8.0 REFERENCES

New Mexico Environment Department/Surface Water Quality Bureau (NMED/SWQB). 2016. Surface Water Quality 10-Year Monitoring and Assessment Strategy. Santa Fe, NM. Available at: https://www.env.nm.gov/surface-water-quality/protocols-and-planning/

New Mexico Administrative Code (NMAC). 2022. *State of New Mexico Standards for Interstate and Intrastate Surface Waters; 20.6.4.* New Mexico Water Quality Control Commission. Santa Fe, NM. Available at: https://www.env.nm.gov/surface-water-quality/wqs/

NMED/SWQB. 2023a. *Procedures for Assessing Water Quality Standards Attainment for the State of New Mexico §303(d) /§305(b) Integrated Report: Comprehensive Assessment and Listing Methodology (CALM)*. Santa Fe, NM. Available at: https://www.env.nm.gov/surface-water-quality/calm/

NMED/SWQB. 2024a. *Quality Assurance Project Plan for Water Quality Management Programs*. Santa Fe, NM. Available at: Available at: https://www.env.nm.gov/surface-water-quality/protocols-and-planning/

NMED/SWQB. 2024b. *2024-2026 State of New Mexico Clean Water Act Section 303(d)/Section 305(b) Integrated List and Report*. Santa Fe, NM. Available at: https://www.env.nm.gov/surface-water-quality/303d-305b/

U.S. Environmental Protection Agency (EPA). 2006. Level III ecoregions of the continental United States (revision of Omernik, 1987): Corvallis, Oregon, USEPA – National Health and Environmental Effects Research Laboratory, Map M-1, various scales.

NMED/SWQB. Standard Operating Procedures (SOPs). The most current version of the SOP will be utilized for SWQB data operations. All SOPs are available at:
https://www.env.nm.gov/surface-water-quality/sop/

NMED/SWQB. 2023a. *SOP 2.1 for Field Sampling Plan Development and Execution.*

NMED/SWQB. 2023. *SOP 5.0 Physical Habitat.*

NMED/SWQB. 2024. *SOP 6.1 for Sondes.*

NMED/SWQB. 2024. *SOP 6.2 for DO and Conductivity Loggers.*

NMED/SWQB. 2019. *SOP 6.3 for Thermographs.*

NMED/SWQB. 2021. *SOP 6.4 for Long-term Deployment Data Logger QA.*

NMED/SWQB. 2022. *SOP 8.1 for Chemical Sampling – Equipment Cleaning Procedure.*

NMED/SWQB. 2024. *SOP 8.2 for Chemical Sampling in Lotic Environments.*

NMED/SWQB. 2023. *SOP 8.4 for PFAS Sample Collection.*

NMED/SWQB. 2023*. SOP 9.1 for Bacteriological Sampling*.

NMED/SWQB. 2025. *SOP 12.1 for Lake Sampling.*

NMED/SWQB. 2023. *SOP 15.0 for Data Verification and Validation.*

APPENDIX A

IR (Integrated Report) Category: Overall water quality standards attainment category for each assessment unit as determined by combining individual designated use support decisions. The unique assessment categories for New Mexico are described as follows:

IR Category (AU)	Overall water quality standards attainment category for each assessment unit as determined by combining individual designated use support decisions. The unique IR categories for New Mexico are described as follows as follows:
IR Category (Parameter)	Water quality standards attainment category for each listed cause of impairment. The unique IR categories for New Mexico are described as follows as follows:
IR Category 1	Attaining the water quality standards for all designated and existing uses. AUs are listed in this category if there are data and information that meet all requirements of the assessment and listing methodology and support a determination that the water quality criteria are attained.
IR Category 2	Attaining some of the designated or existing uses based on numeric and narrative parameters that were tested, and no reliable monitored data is available to determine if the remaining uses are attained or threatened. AUs are listed in this category if there are data and information that meet requirements of the assessment and listing methodology to support a determination that some, but not all, uses are attained based on numeric and narrative water quality criteria that were tested. Attainment status of the remaining uses is unknown because there is no reliable monitored data with which to make a determination.
IR Category 3/3A	Insufficient of no reliable monitored data and/or information to determine if any designated or existing use is attained. No data available -- AUs are listed in this subcategory when there are no available data to assess. These are considered high priority for follow up monitoring.
IR Category 3/3B	Insufficient monitored data and/or information to determine if any designated or existing use is attained. Limited data (n = 1 to 3) available, no exceedances -- AUs are listed in this subcategory when there are no exceedances of any applicable criteria in the limited data set. Their priority for follow up monitoring depends on the parameter and concentration (for example, measurements near the criteria would increase the priority for additional sampling).
IR Category 3/3C	Insufficient monitored data and/or information to determine if any designated or existing use is attained. Limited data (n = 1 to 3) available, exceedance(s) -- AUs are listed in this subcategory when there are exceedances of one or more applicable criteria in the limited data set. These are considered high priority for follow up monitoring.

IR Category 4A	Impaired for one or more designated uses but does not require development of a TMDL because TMDL has been completed. AUs are listed in this subcategory once all TMDL(s) have been developed and approved by EPA that, when implemented, are expected to result in full attainment of the standard. Where more than one pollutant is associated with the impairment of an AU, the AU remains in IR Category 5A (see below) until all TMDLs for each pollutant have been completed and approved by EPA.
IR Category 4B	Impaired for one or more designated uses but does not require development of a TMDL because other pollution control requirements are reasonably expected to result in attainment of the water quality standard in the near future. Consistent with the regulation under 40 CFR 130.7(b)(i), (ii), and (iii), AUs are listed in this subcategory where other pollution control requirements required by local, state, or federal authority are stringent enough to implement any water quality standard (WQS) applicable to such waters.
IR Category 4C	Impaired for one or more designated uses but does not require development of a TMDL because impairment is not caused by a pollutant. AUs are listed in this subcategory if a pollutant does not cause the impairment. For example, EPA considers flow alteration to be “pollution” vs. a “pollutant.”
IR Category 5/5A	Impaired for one or more designated or existing uses and a TMDL is underway or scheduled. AUs are listed in this category if the AU is impaired for one or more designated uses by a pollutant. Where more than one pollutant is associated with the impairment of a single AU, the AU remains in IR Category 5A until TMDLs for all pollutants have been completed and approved by EPA.
IR Category 5/5B	Impaired for one or more designated or existing uses and a review of the water quality standard will be conducted. AUs are listed in this category when it is possible that water quality standards are not being met because one or more current designated use is inappropriate. After a review of the water quality standard is conducted, a Use Attainability Analysis (UAA) will be developed and submitted to EPA for consideration, or the AU will be moved to IR Category 5A and a TMDL will be scheduled.
IR Category 5/5C	Impaired for one or more designated or existing uses and Additional data will be collected before a TMDL is scheduled. AUs are listed in this category if there is not enough data to determine the pollutant of concern or there is not adequate data to develop a TMDL. For example, AUs with biological impairment will be listed in this category until further research can determine the particular pollutant(s) of concern. When the pollutant(s) are determined, the AU will be moved to IR Category 5A and a TMDL will be scheduled. If it is determined that the current designated

	uses are inappropriate, it will be moved to IR Category 5B and a UAA will be developed. If it is determined that "pollution" is causing the impairment (vs. a "pollutant"), the AU will be moved to IR Category 4C.
IR Category 5-R (previous 5-ALT)	Advance restoration approach is in progress or under development. EPA created this optional subcategory as an organizing tool to clearly articulate which impaired waterbodies have or will have alternative approaches to attain WQS (EPA 2015). The advance restoration approach needs to clearly demonstrate how the WQS will be achieved. The description of the advance restoration approach and the waters to which it applies will be included during public review of the draft Integrated Report, so that the public has an opportunity to view the proposed advance restoration approaches. Additional details on what must be included in the description are found in EPA's listing guidance (EPA 2015).

APPENDIX B

Organics (semi-volatiles)	Organics (volatiles)
1,2,4-Trichlorobenzene	1,1,1,2-Tetrachloroethane
1,2-Dichlorobenzene	1,1,1-Trichloroethane
1,2-Dinitrobenzene	1,1,2,2-Tetrachloroethane
1,3-Dichlorobenzene	1,1,2-Trichloroethane
1,3-Dinitrobenzene	1,1-Dichloroethane
1,4-Dichlorobenzene	1,1-Dichloroethene
1,4-Dinitrobenzene	1,1-Dichloropropene
1-Methylnaphthalene	1,2,3-Trichlorobenzene
2,3,4,6-Tetrachlorophenol	1,2,3-Trichloropropane
2,3,5,6-Tetrachlorophenol	1,2,4-Trichlorobenzene
2,4,5-Trichlorophenol	1,2,4-Trimethylbenzene
2,4,6-Trichlorophenol	1,2-Dibromo-3-chloropropane (DBCP)
2,4-Dichlorophenol	1,2-Dibromoethane (EDB)
2,4-Dimethylphenol	1,2-Dichlorobenzene
2,4-Dinitrophenol	1,2-Dichloroethane
2,4-Dinitrotoluene	1,2-Dichloropropane
2,6-Dinitrotoluene	1,3,5-Trimethylbenzene
2-Chloronaphthalene	1,3-Dichlorobenzene
2-Chlorophenol	1,3-Dichloropropane
2-Methylnaphthalene	1,4-Dichlorobenzene
2-Methylphenol	1,4-Dioxane
2-Nitroaniline	2,2-Dichloropropane
2-Nitrophenol	2-Butanone (MEK)
3,3'-Dichlorobenzidine	2-Chloroethyl vinyl ether
3-Methylphenol & 4-Methylphenol	2-Chlorotoluene
3-Nitroaniline	2-Hexanone
4,4'-DDD	4-Chlorotoluene
4,4'-DDE	4-Isopropyltoluene
4,4'-DDT	4-Methyl-2-pentanone
4,6-Dinitro-2-methylphenol	Acetone
4-Bromophenyl Phenyl Ether	Acetonitrile
4-Chloro-3-methylphenol	Acrolein
4-Chloroaniline	Acrylonitrile
4-Chlorophenyl Phenyl Ether	Allyl chloride
4-Nitroaniline	Benzene
4-Nitrophenol	Bromobenzene
Acenaphthene	Bromochloromethane
Acenaphthylene	Bromodichloromethane
Alachlor	Bromoform
Aldrin	Bromomethane
alpha-BHC	Carbon disulfide
Aniline	Carbon tetrachloride
Anthracene	Chlorobenzene

Organics (semi-volatiles)	Organics (volatiles)
Atrazine	Chloroethane
Azobenzene	Chloroform
Benzidine	Chloromethane
Benzo(a)anthracene	Chloroprene
Benzo(a)pyrene	cis-1,2-Dichloroethene
Benzo(b)fluoranthene	cis-1,3-Dichloropropene
Benzo(g,h,i)perylene	cis-1,4-Dichloro-2-butene
Benzo(k)fluoranthene	Dibromochloromethane
Benzyl alcohol	Dibromomethane
beta-BHC	Dichlorodifluoromethane
bis(2-Chloroethoxy)methane	Ethyl methacrylate
bis(2-Chloroethyl)ether	Ethylbenzene
bis(2-Chloroisopropyl)ether	Hexachlorobutadiene
bis(2-Ethylhexyl)adipate	Iodomethane
bis(2-Ethylhexyl)phthalate	Isobutyl alcohol
Butyl Benzyl Phthalate	Isopropylbenzene
Carbazole	m- & p-Xylenes
Chrysene	Methyl methacrylate
cis-Chlordane	Methylacrylonitrile
Cyanazine	Methylene chloride (Dichloromethane)
delta-BHC	Naphthalene
Dibenz(a,h)anthracene	n-Butylbenzene
Dibenzofuran	Nitrobenzene
Dieldrin	o-Xylene
Diethylphthalate	Pentachloroethane
Dimethylphthalate	Propionitrile
Di-n-butyl Phthalate	Propylbenzene
Di-n-octyl phthalate	sec-Butylbenzene
Endosulfan I	Styrene
Endosulfan II	tert-Butyl methyl ether (MTBE)
Endosulfan sulfate	tert-Butylbenzene
Endrin	Tetrachloroethene
Endrin aldehyde	Tetrahydrofuran (THF)
Endrin ketone	Toluene
Fluoranthene	Total trihalomethanes
Fluorene	Total xylenes
gamma-BHC (lindane)	trans-1,2-Dichloroethene
Heptachlor	trans-1,3-Dichloropropene
Heptachlor epoxide	trans-1,4-Dichloro-2-butene
Hexachlorobenzene	Trichloroethene
Hexachlorobutadiene	Trichlorofluoromethane
Hexachlorocyclopentadiene	Vinyl acetate
Hexachloroethane	Vinyl chloride
Indeno(1,2,3-cd)pyrene	
Isophorone	

Organics (semi-volatiles)	Organics (volatiles)
Methoxychlor	
Metolachlor	
Metribuzin	
Naphthalene	
Nitrobenzene	
N-nitrosodimethylamine	
N-nitroso-di-n-propylamine	
N-nitrosodiphenylamine	
Pentachlorophenol	
Phenanthrene	
Phenol	
Prometryne	
Pyrene	
Pyridine	
Simazine	
trans-Chlordane	

Perfluorinated and Polyfluorinated Alkyl Substances (PFAS)			Targeted By	
PFAS Compound Name	Abbreviation	CAS Number	EPA Method 537.1	EPA Method 533
perfluorobutanoic acid	PFBA	375-22-4		yes
perfluoropentanoic acid	PFPeA	2706-90-3		yes
perfluorohexanoic acid	PFHxA	307-24-4	yes	yes
perfluoroheptanoic acid	PFHpA	375-85-9	yes	yes
perfluorooctanoic acid	PFOA	335-67-1	yes	yes
perfluorononanoic acid	PFNA	375-95-1	yes	yes
perfluorodecanoic acid	PFDA	335-76-2	yes	yes
perfluoroundecanoic acid	PFUnA	2058-94-8	yes	yes
perfluorododecanoic acid	PFDoA	307-55-1	yes	yes
perfluorotridecanoic acid	PFTrDA	72629-94-8	yes	
perfluorotetradecanoic acid	PFTA	376-06-7	yes	
perfluorobutanesulfonic acid	PFBS	375-73-5	yes	yes
perfluoropentanesulfonic acid	PFPeS	2706-91-4		yes
perfluorohexanesulfonic acid	PFHxS	355-46-4	yes	yes

perfluoroheptanesulfonic acid	PFHpS	375-92-8		yes
perfluorooctanesulfonic acid	PFOS	1763-23-1	yes	yes
hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6	yes	yes
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4	yes	yes
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6	yes	
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9	yes	
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	756426-58-1	yes	yes
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9	yes	yes
perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1		yes
perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5		yes
nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6		yes
perfluoro(2-ethoxyethane)sulfonic acid	PFEESA	113507-82-7		yes
1H,1H,2H,2H-perfluorohexane sulfonic acid	4:2FTS	757124-72-4		yes
1H,1H,2H,2H-perfluorooctane sulfonic acid	6:2FTS	27619-97-2		yes
1H,1H,2H,2H-perfluorodecane sulfonic acid	8:2FTS	39108-34-4		yes

APPENDIX C – FIELD SAMPLING PLAN REVISIONS 2025