NEW MEXICO ENVIRONMENT DEPARTMENT

Surface Water Quality Bureau

2021-2022 Watershed Survey

FIELD SAMPLING PLAN

Rio Puerco, Rio San Jose, and Little Colorado River Watersheds

4/5/2021

Prepared by

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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
IR	State of New Mexico Clean Water Act §303(d)/305(b) Integrated Report
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
PSRS	Point Source Regulation Section
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
SLD	Scientific Laboratory Division
SOP	Standard Operating Procedure
SWQB	Surface Water Quality Bureau
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UAA	Use Attainability Analysis
USEPA	United States Environmental Protection Agency
USFWS	United States Forest Service
WPS	Watershed Protection Section
WQ	Water Quality
WQCC	Water Quality Control Commission
WQS	Water Quality Standards
WTU	Work Time Unit
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 in the Rio Puerco, Rio San Jose, and Little Colorado River watersheds during 2021-2022 by the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB). It has been prepared in accordance with SWQB *Standard Operating Procedure 2.1: Field Sampling Plan Development and Execution* (NMED/SWQB 2019b). The Plan describes project objectives and decision criteria, and it includes the sampling schedule with locations, constituents, 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.

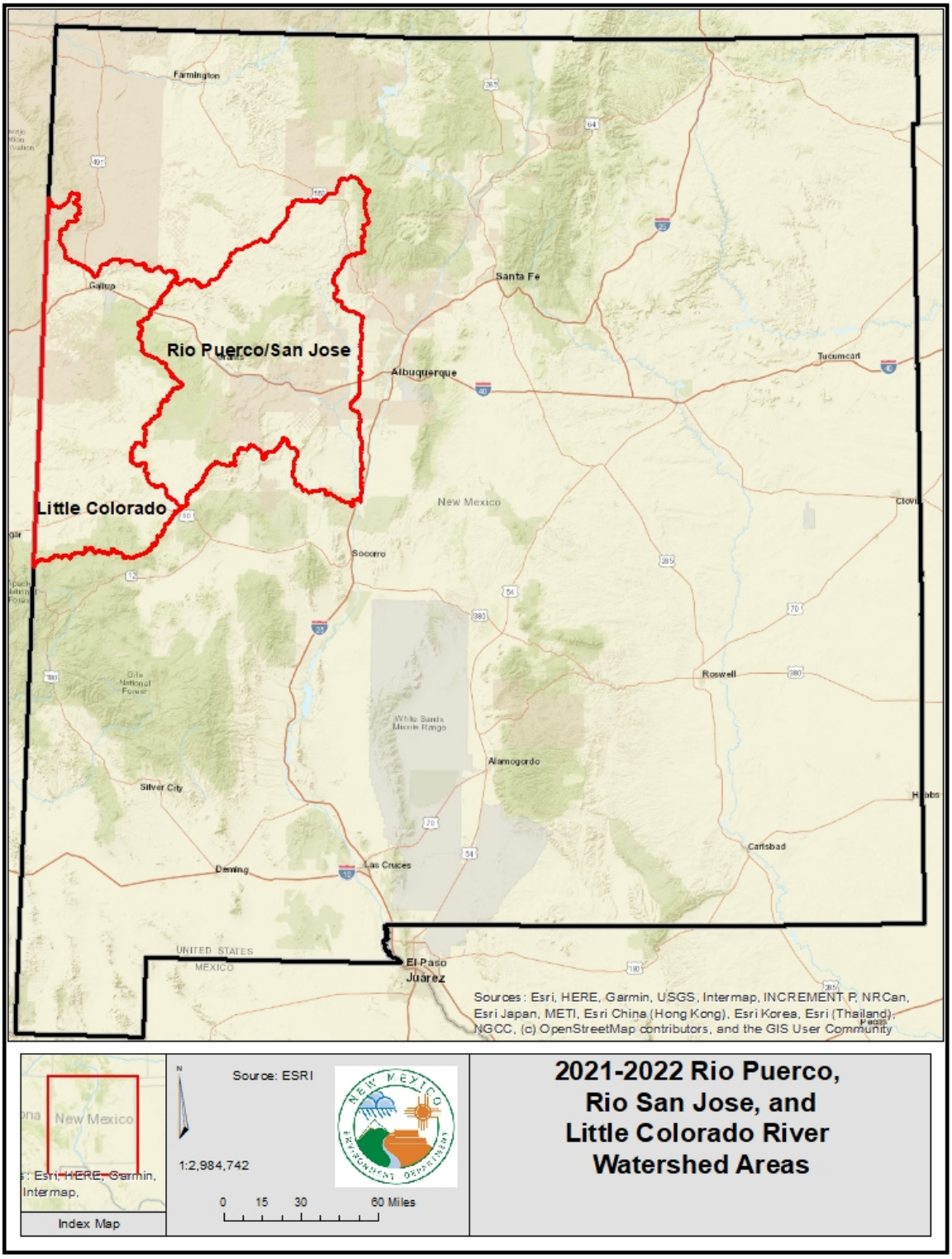
This is a companion document to the SWQB *Quality Assurance Project Plan for Water Quality Management Programs* (NMED/SWQB 2018a) (QAPP). Data will be collected according to the QAPP and the appropriate SWQB Standard Operating Procedures (SOPs). Both the QAPP and SOPs are posted on the SWQB website at https://www.env.nm.gov/surface-water-quality/qaqc/

The project area includes (Figure 1): the Rio Puerco, Rio San Jose, and Little Colorado River watersheds. The survey includes many of the tributaries and lakes within these watersheds.

Historic and current land uses in the watersheds include agriculture (range, pasture, and croplands), mining, oil and gas, forest, grassland, residential, shrubland, water, and wetlands. Land ownership in the watershed includes tribal lands, Bureau of Land Management (BLM), U.S. Forest Service, Bureau of Reclamation (USFS BOR), National Park Service, New Mexico State Parks, New Mexico Department of Game and Fish, and state and private parcels. The study areas incorporate Rio Puerco, Rio San Jose, and Little Colorado River basins and together encompass approximately 13,789 square miles (35,713 square kilometers) in New Mexico. The watersheds are located in Omernik Level III Ecoregions 21 (Southern Rockies), 22 (Arizona/New Mexico Plateau), and 23 (Arizona/New Mexico Mountains) (USEPA 2006).

The 2011 SWQB water quality survey of these areas identified waters that are attaining New Mexico Water Quality Standards (WQS) and waters that are impaired (i.e. not attaining their specific designated uses). Rivers and streams are divided into assessment units (AUs) based on differing geological and hydrological properties, and each AU is assessed individually using data from one or more monitoring sites located within the AU. Lakes are assigned a unique AU for each waterbody. For this survey, selected monitoring locations will be sampled for water quality constituents from 4-8 times over two consecutive years. The total number of samples for each location is determined through a priority ranking of CWA §303(d)/ §305(b) Integrated Report (IR) classification, presence of point source discharge, and Total Maximum Daily Load (TMDL) status, among other considerations. The framework for monitoring prioritization is discussed in the SWQB 10-Year Monitoring and Assessment Strategy (available at https://www.env.nm.gov/surface-water-quality/protocols-and-planning/) (NMED/SWQB 2016). The type of monitoring planned at each site is discussed and summarized in Section 5, Sampling Plan.

Figure 1. 2021-2022 Rio Puerco, Rio San Jose, and Little Colorado River Watershed Survey Areas



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 appropriate supervisors. Questions or comments on this Field Sampling Plan should be directed to the MASS project manager(s).

Table 1. Personnel Roles and Responsibilities

Team Member	Position/Role	Responsibilities
Kris Barrios Monitoring, Assessment, and Standards Section Program Manager Kristopher.Barrios@state.nm.us (505) 946-8713	Program Manager	Approve FSP, direct 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) Provide oversight and coordinate with 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
Charles Dentino Monitoring Team Supervisor Charles.Dentino1@state.nm.us (505) 946-8868	Project Manager	Manage project personnel and resources throughout the project in coordination with Program Manager. 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-project meeting with team to discuss any changes to the project plan. Coordinate and conduct post-project meeting with team to discuss differences between planned and actual sampling and what data gaps, if any, exist. Write, coordinate, and assemble report and/or other grant deliverables required of the project.
Jonathan Celmer Monitoring Team Scientist Jonathan.Celmer@state.nm.us (505) 946-8808 Eliza Montoya Monitoring Team Scientist Eliza.Montoya@state.nm.us (505) 819-8099 Elizabeth Stuffings Monitoring Team Scientist Elizabeth.Stuffings@state.nm.us (505) 819-9926 Meredith Zeigler Monitoring Team Scientist Meredith.Zeigler@state.nm.us (505) 490-5866	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. Write assigned sections of reports and/or other grant deliverables required throughout the project.

Team Member	Position/Role	Responsibilities
Miguel Montoya Miguel.Montoya@state.nm.us (505) 819-9882	QAO	Approve and ensure FSP is retained in accordance with 1.21.2 NMAC, Retention and Disposition of Public Records. Conduct audits as needed to ensure compliance with FSP, QAPP and SOPs.
Jennifer Fullam Jennifer.Fullam@state.nm.us (505) 946-8965	Standards, Planning and Reporting Team (SPRT) Liaison	Provide information and data needs pertaining to water quality standards development and refinement located within the study area.
Heidi Henderson Heidi.Henderson@state.nm.us (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.
Sarah Holcomb Sarah.Holcomb@state.nm.us (505) 819-9734	Point Source Regulation Section (PSRS) Liaison	Provide information and data needs pertaining to point source discharges located within the study area.
Abe Franklin Abraham.Franklin@state.nm.us (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.

2.2 Organization

For the responsibilities defined in this project, the Project Manager, Project Team, Standards, Planning and Reporting Team Liaison and TMDL and Assessment Team Liaison report to the MASS Program Manager. The Point Source Regulation Section (PSRS) Liaison and the Watershed Protection Section (WPS) Liaison are the Program Managers for their Sections 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 states 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 §303(d) Program in New Mexico consists of three major steps: monitoring 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 2020) (IR). It 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 to provide for protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water is 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.

This Field Sampling Plan describes activities focused on meeting the goals of the most recent, EPA-approved IR (NMED/SWQB 2020). The impairments for AUs in this survey area, listed in **Table 2,** were identified during SWQB's most recent surveys of this watershed, conducted in 2007, 2010, and 2011, and included data from various other investigations. The "IR Category" column provides the current AU's IR status (see Appendix A for definitions). "Water Quality Segment" provides the applicable WQS reference as assigned to each AU and described in Section 20.6.4 New Mexico Administrative Code (NMAC) as governed by the New Mexico Water Quality Control Commission (WQCC) (NMAC 2020). The purpose of 20.6.4 NMAC is to establish WQS consisting of the 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 Assessment Unit.

Assessment of surface waters against the WQS occurs after the monitoring data have been verified and validated using the most recent assessment protocols. These protocols are updated every odd year (e.g. 2021) and are opened for the EPA and the public to review and comment as part of the update process. Every even year (e.g. 2020), the State's IR List reports waterbodies determined to be impaired, for which the State develops TMDLs or TMDL alternatives.

Table 2. Rio Puerco, Rio San Jose, and Little Colorado River Watersheds: Impairment and TMDL Status of Survey Assessment Units

Assessment Unit Name	WQS Reference	IR Category	Impairments	TMDL Completed
Bluewater Creek (Perennial prt Bluewater Rsvr to headwaters)	20.6.4.109	4A	Temperature	Nutrients|Temperature
Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	20.6.4.109	4A	Nutrients|Temperature	Nutrients|Temperature
Bluewater Lake	20.6.4.135	5/5A	Nutrients	
La Jara Creek (Perennial reaches abv Arroyo San Jose)	20.6.4.109	4A	Aluminum, Total Recoverable	Aluminum, Total Recoverable
Largo Creek (Carrizo Wash to headwaters)	20.6.4.98	3/3A		

Assessment Unit Name	WQS Reference	IR Category	Impairments	TMDL Completed
Nacimiento Ck (Perennial prt HWY 126 to Clear Creek)	20.6.4.109	4A	Aluminum, Total Recoverable|Turbidity| Uranium, Dissolved	Aluminum, Total Recoverable|Turbidity| Uranium, Dissolved
Puerco River (Gallup WWTP to South Fork Puerco R)	20.6.4.98	3/3A		
Puerco River (non-tribal AZ border to Gallup WWTP)	20.6.4.99	5/5A	Ammonia, Total	
Quemado Lake	20.6.4.453	5/5A	Nutrients	
Ramah Reservoir	20.6.4.452	5/5A	Nutrients	
Rio Puerco (Arroyo Chijuilla to northern bnd Cuba)	20.6.4.131	5/5C	Ammonia, Total|Nutrients| Sedimentation/Siltation	Ammonia, Total|Nutrients| Sedimentation/Siltation
Rio Puerco (non-pueblo Arroyo Chico to Arroyo Chijuilla)	20.6.4.130	1		
Rio Puerco (non-pueblo Rio Grande to Arroyo Chico)	20.6.4.130	5/5C	*E. coli*|Mercury, Total	
Rio Puerco (Perennial prt northern bnd Cuba to headwaters)	20.6.4.109	4A	Sedimentation/Siltation	Sedimentation/Siltation
Rio San Jose (non-tribal HWY 117 to Grants BNSF RR crossing)	20.6.4.99	1		
Rito de los Pinos (Arroyo San Jose to headwaters)	20.6.4.98	3/3A		
Rito Leche (Intermittent reaches above HWY 126)	20.6.4.98	2		
Rito Leche (Rio Puerco to Hwy 126)	20.6.4.98	2		
Senorito Creek (Nacimiento Mine to headwaters)	20.6.4.109	2		
Senorito Creek (San Pablo Canyon to Nacimiento Mine)	20.6.4.98	2		

3.2 Objectives

Table 3 outlines the project objectives identified by SWQB to meet its various programmatic data needs. Data needs have been determined based on impairments from previous studies, identified data gaps, and consultation with SWQB MASS, PSRS, and WPS staff, and other state agencies, federal agencies, tribes, and 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 Analyses (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

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

In order to achieve the goals outlined in Section 3.2, this survey uses a targeted monitoring design to address data needs identified for assessment, TMDLs, potential standards revisions, and point source monitoring. Monitoring sites are 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 4–8 site visits during the survey. Through public outreach, inter-agency coordination, and a scoring system that considers various factors, a two-tier monitoring system – primary and secondary – has been developed to prioritize AUs. High ranking priority waters (primary AUs) receive the most monitoring, whereas low ranking waters (secondary AUs) receive the least. The two-year monitoring allows more data to be collected from the highest priority waters to

better capture inter-annual variability due to hydrologic conditions. The SWQB may also adjust year-2 monitoring based on year-1 analytical results.

3.4 Project Schedule

As part of the survey planning process, SWQB held a 30-day public comment period to receive 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.

The progress of this project will be documented and tracked from its 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). The lag time to receive results is calculated 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, SWQB will assess the data for incorporation into the 2024-2026 IR List. Once the assessments are complete, the TMDL development process will begin for any identified impairments.

Table 4. Project Schedule

Activity	Winter 2020-2021	Spring 2021	Summer 2021	Fall 2021	Winter 2021-2022	Spring 2022	Summer 2022	Fall 2022	Winter 2022-2023	Spring 2023	Fall 2023
Survey Planning, Site Reconnaissance, and Public Input Period	==========	▶									
Data Collection & Submittal of WQ Samples to SLD		==========	==========	▶		==========	==========	▶			
Data Verification & Validation Procedures, Assessment of data		==========	==========	==========	==========	==========	==========	==========	==========	==========	▶
Publication of Survey Report									==========	==========	▶

3.5 Project Location

The project area includes the Rio Puerco, Rio San Jose, and Little Colorado River watersheds. The Rio Puerco watershed includes the Rio Puerco and tributaries from the headwaters near Cuba, NM to the Rio Grande south of Belen, NM. The Rio San Jose survey area includes the Rio San Jose and Bluewater Creek watersheds. The Little Colorado River survey area includes the Puerco River, Ramah Lake, and Quemado Lake. **Table 5** show a complete list of stations illustrated in **Figures 2 and 3**.

Table 5. Rio Puerco, Rio San Jose, and Little Colorado River Watersheds: Water Quality Stations

Map #	Station Name	Station ID	Assessment Unit	Rationale/Comments
1	Bluewater Creek above Bluewater Lake at USGS gage 8341300 - 36Bluewa018.9	36Bluewa018.9	Bluewater Creek (Perennial prt Bluewater Rsvr to headwaters)	AU impaired for temperature, inlet station for Bluewater Lake
2	BLUEWATER CREEK AT MOUTH OF BLUEWATER CANYON - 36Bluewa003.5	36Bluewa003.5	Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	AU impaired for nutrients and temperature
3	Bluewater Creek blw Dam - 36Bluewa016.7	36Bluewa016.7	Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	Outlet for Bluewater Lake
4	Bluewater Creek blw Restoration - 36Bluewa002.5	36Bluewa002.5	Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	Below restoration project, lowest station in AU
5	BLUEWATER LAKE AT DAM - 36BluWaterLkDm	36BluWaterLkDm	Bluewater Lake	AU impaired for nutrients
6	BLUEWATER LAKE NEAR PINE CANYON - 36BluWaterLkSh	36BluWaterLkSh	Bluewater Lake	AU impaired for nutrients
7	Cuba WWTP effluent - NM0024848	NM0024848	Rio Puerco (Arroyo Chijuilla to northern bnd Cuba)	NPDES permit
8	Gallup WWTP - NM0020672	NM0020672	Puerco River (non-tribal AZ border to Gallup WWTP)	NPDES permit
9	La Jara Creek abv irrigation diversion - 33LaJara009.7	33LaJara009.7	La Jara Creek (Perennial reaches abv Arroyo San Jose)	AU impaired for aluminum
10	Largo Creek abv Quemado Lake - 74LargoC071.5	74LargoC071.5	Largo Creek (Carrizo Wash to headwaters)	Lake Inlet
11	Largo Creek blw Quemado Reservoir - 74LargoC068.2	74LargoC068.2	Largo Creek (Carrizo Wash to headwaters)	Lake outlet
12	Nacimiento Creek at Eureka Rd. - 33Nacimi008.0	33Nacimi008.0	Nacimiento Ck (Perennial prt HWY 126 to Clear Creek)	AU impaired for aluminum, turbidity, and uranium. Below mine
13	Puerco River at Allison River - 76Puerco036.6	76Puerco036.6	Puerco River (Gallup WWTP to South Fork Puerco R)	Lowest Station in AU, abv WWTP
14	Puerco River at CR -1 - 76Puerco029.1	76Puerco029.1	Puerco River (non-tribal AZ border to Gallup WWTP)	AU impaired for ammonia

Map #	Station Name	Station ID	Assessment Unit	Rationale/Comments
15	Quemado Dam - 74QuemadoDam	74QuemadoDam	Quemado Lake	Lake impaired for nutrients
16	RAMAH Reservoir DEEP Near DAM - 75RamahLKDeep	75RamahLKDeep	Ramah Reservoir	Lake impaired for nutrients
17	Rio Puerco abv WWTP - 33RPuerc244.0	33RPuerc244.0	Rio Puerco (Arroyo Chijuilla to northern bnd Cuba)	Above WWTP
18	Rio Puerco at CR13 Bridge - 33RPuerc256.0	33RPuerc256.0	Rio Puerco (Perennial prt northern bnd Cuba to headwaters)	Lowest station in AU
19	Rio Puerco at Hwy 279 Bridge near San Luis - 33RPuerc198.4	33RPuerc198.4	Rio Puerco (non-pueblo Arroyo Chico to Arroyo Chijuilla)	Lowest station in AU
20	Rio Puerco at I-25 - 33RPuerc004.6	33RPuerc004.6	Rio Puerco (non-pueblo Rio Grande to Arroyo Chico)	AU impaired for *E.coli* and Mercury, lowest station in AU
21	Rio Puerco at I-40 - 33RPuerc102.2	33RPuerc102.2	Rio Puerco (non-pueblo Rio Grande to Arroyo Chico)	Added due to long AU
22	Rio Puerco blw WWTP at Sanchez Property - 33RPuerc241.8	33RPuerc241.8	Rio Puerco (Arroyo Chijuilla to northern bnd Cuba)	AU impaired for ammonia, nutrients, sedimentation/siltation , lowest station in AU
23	Rio San Jose abv Unnamed Arroyo - 36RSanJo119.6	36RSanJo119.6	Rio San Jose (non-tribal HWY 117 to Grants BNSF RR crossing)	Above WWTP
24	Rio San Jose at Hwy 117 - 36RSanJo111.0	36RSanJo111.0	Rio San Jose (non-tribal HWY 117 to Grants BNSF RR crossing)	Lowest station in AU
25	Rito de los Pinos at USFS gate on FR 95 - 33RPinos006.8	33RPinos006.8	Rito de los Pinos (Arroyo San Jose to headwaters)	Most likely station in AU to be wet
26	Rito Leche at Cubita Rd. - 33RLeche001.3	33RLeche001.3	Rito Leche (Rio Puerco to Hwy 126)	Only station in AU, likely dry
27	Rito Leche at Hwy 126 - 33RLeche002.6	33RLeche002.6	Rito Leche (Intermittent reaches above HWY 126)	Lowest station in AU
28	Senorito Creek abv Nacimiento Mine - 33Senori008.8	33Senori008.8	Senorito Creek (Nacimiento Mine to headwaters)	Above mine
29	Senorito Creek blw Nacimiento Mine - 33Senori006.8	33Senori006.8	Senorito Creek (San Pablo Canyon to Nacimiento Mine)	Lowest station in AU, below mine

Figure 2. Rio Puerco, Rio San Jose, and Little Colorado River Sampling Locations – East Side

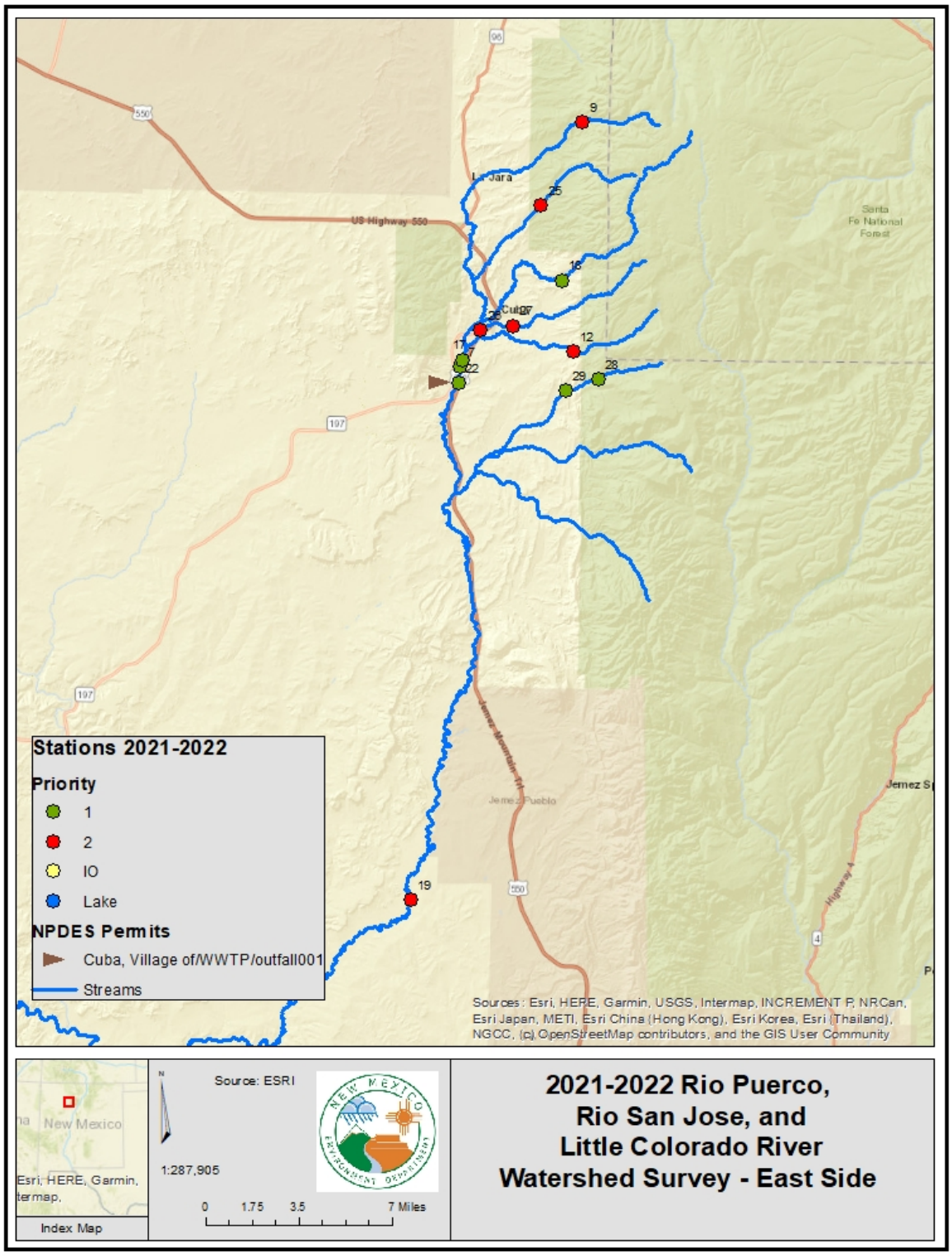
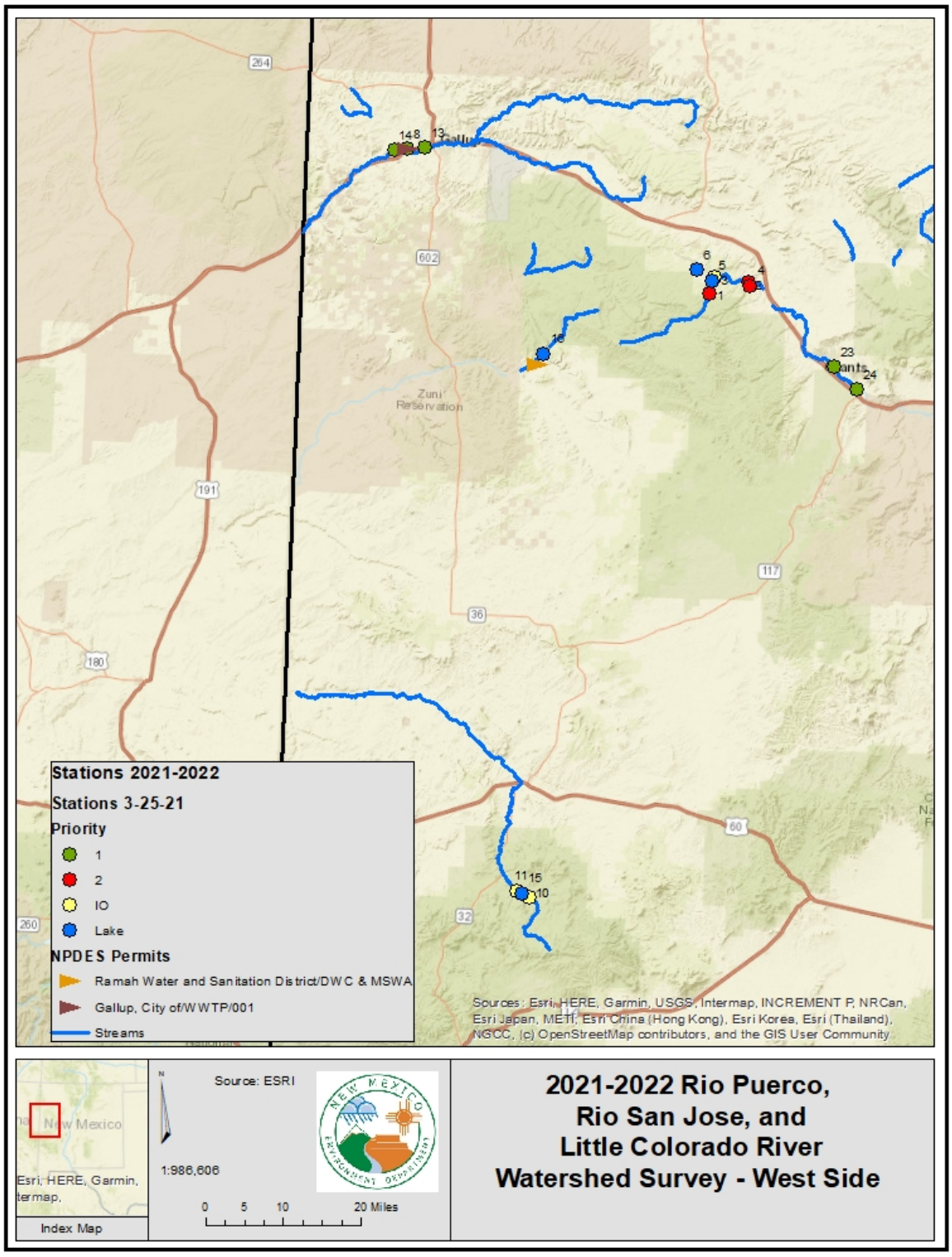


Figure 3. Rio Puerco, Rio San Jose, and Little Colorado River Sampling Locations – West Side



4.0 DOCUMENTATION

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

SWQB will maintain documents in accordance with the requirements of the SWQB QAPP for Water Quality Management Programs (NMED/SWQB 2018).

SWQB will organize survey data within the following project folder in the SWQB database:

- Rio Puerco, Rio San Jose, and Little Colorado River Survey 2021-2022

Project activities will be documented in SWQB Monitoring Field Sheets. Information from field sheets will be entered into the SWQB database and maintained in accordance with SWQBs QAPP and SOPs. Analytical results will be electronically transferred into the SWQB database and uploaded to EPA's Water Quality Exchange database. SWQB completes the project with a final Survey Report.

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

5.0 SAMPLING PLAN

5.1 Chemistry Sampling

SWQB will conduct 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 in accordance with SWQB SOP 8.1 Chemical Sampling – Equipment Cleaning Procedure, SOP 8.2 Chemical Sampling in Lotic Environments, SOP 9.1 Bacteriological Sampling and SOP 12.1 Lake Sampling.

Water quality samples will be analyzed by the SLD or the SWQB 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 planned during the two-year survey and their sampling frequency. The Priority column of **Table 6** documents chemical sampling priority for each sampling station. The numbers listed within the analyte columns describe the number of analyte samples planned for each station during the 2021-2022 survey. The footnotes to **Table 6** contain more detailed information.

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, SWQB will not sample all the water quality criteria listed in 20.6.4.900 NMAC at all stations. Radionuclides and volatile/semi-volatile organic compounds will be sampled in major tributaries and lakes. PCBs generally will not be sampled in the water column since these compounds have not been

detected at levels of concern in previous water samples for these areas. Assessment units with current or historic metals impairments have received higher numbers of metals samples.

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 site using an In-Situ® multi-parameter sonde following SWQB SOPs.

Table 6. Rio Puerco, Rio San Jose, and Little Colorado River Watershed Survey: Water Chemistry Sampling Frequency

Map #	Station Name	Station ID	Assessment Unit	PRIORITY[1]	TDS/TSS	TDS/TSS/SO4-/Cl-	Nutrients[2]	Nutrients (high P)	Dissolved Organic Carbon (DOC)	Total Metals[3]	Dissolved Metals[4]	*E. coli*	Volatile Organics[5]	Semi-Volatile Organics[5]	Radionuclides[6]
1	Bluewater Creek above Bluewater Lake at USGS gage 8341300 - 36Bluewa018.9	36Bluewa018.9	Bluewater Creek (Perennial prt Bluewater Rsvr to headwaters)	2	4		4		4	4	4	4			
2	BLUEWATER CREEK AT MOUTH OF BLUEWATER CANYON - 36Bluewa003.5	36Bluewa003.5	Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	2	4		4		4	4	4	4			
3	Bluewater Creek blw Dam - 36Bluewa016.7	36Bluewa016.7	Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	IO	4		4		4	4	4	4			
4	Bluewater Creek blw Restoration - 36Bluewa002.5	36Bluewa002.5	Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	2	4		4					4			
5	BLUEWATER LAKE AT DAM - 36BluWaterLkDm	36BluWaterLkDm	Bluewater Lake	L	4		4		4	4	4	4	2	2	2
6	BLUEWATER LAKE NEAR PINE CANYON - 36BluWaterLkSh	36BluWaterLkSh	Bluewater Lake	L	4		4		4			4			
7	Cuba WWTP effluent - NM0024848	NM0024848	Rio Puerco (Arroyo Chijuilla to northern bnd Cuba)	1	8			8				8			

Map #	Station Name	Station ID	Assessment Unit	PRIORITY[1]	TDS/TSS	TDS/TSS/SO4-/Cl-	Nutrients[2]	Nutrients (high P)	Dissolved Organic Carbon (DOC)	Total Metals[3]	Dissolved Metals[4]	*E. coli*	Volatile Organics[5]	Semi-Volatile Organics[5]	Radionuclides[6]
8	Gallup WWTP - NM0020672	NM0020672	Puerco River (non-tribal AZ border to Gallup WWTP)	1	8			8				8			
9	La Jara Creek abv irrigation diversion - 33LaJara009.7	33LaJara009.7	La Jara Creek (Perennial reaches abv Arroyo San Jose)	2	4		4		4	4	4	4			
10	Largo Creek abv Quemado Lake - 74LargoC071.5	74LargoC071.5	Largo Creek (Carrizo Wash to headwaters)	IO	1		1		1			1			
11	Largo Creek blw Quemado Reservoir - 74LargoC068.2	74LargoC068.2	Largo Creek (Carrizo Wash to headwaters)	IO	1		1		1			1			
12	Nacimiento Creek at Eureka Rd. - 33Nacimi008.0	33Nacimi008.0	Nacimiento Ck (Perennial prt HWY 126 to Clear Creek)	2	4		4		4	4	4	4			
13	Puerco River at Allison Road - 76Puerco036.6	76Puerco036.6	Puerco River (Gallup WWTP to South Fork Puerco R)	1											
14	Puerco River at CR -1 - 76Puerco029.1	76Puerco029.1	Puerco River (non-tribal AZ border to Gallup WWTP)	1	8		8		6	6	6	8			
15	Quemado Dam - 74QuemadoDam	74QuemadoDam	Quemado Lake	L	4		4		4	4	4	4	2	2	2
16	RAMAH Reservoir DEEP Near DAM - 75RamahLKDeep	75RamahLKDeep	Ramah Reservoir	L	4		4		4	4	4	4	2	2	2
17	Rio Puerco abv WWTP - 33RPuerc244.0	33RPuerc244.0	Rio Puerco (Arroyo Chijuilla to northern bnd Cuba)	1	8		8		6	6	6	8	2	2	2
18	Rio Puerco at CR13 Bridge - 33RPuerc256.0	33RPuerc256.0	Rio Puerco (Perennial prt northern bnd Cuba to headwaters)	1	8		8		6	6	6	8			
19	Rio Puerco at Hwy 279 Bridge near San Luis - 33RPuerc198.4	33RPuerc198.4	Rio Puerco (non-pueblo Arroyo Chico to Arroyo Chijuilla)	2		4	4		4	4	4	4			

Map #	Station Name	Station ID	Assessment Unit	PRIORITY[1]	TDS/TSS	TDS/TSS/SO4-/Cl-	Nutrients[2]	Nutrients (high P)	Dissolved Organic Carbon (DOC)	Total Metals[3]	Dissolved Metals[4]	*E. coli*	Volatile Organics[5]	Semi-Volatile Organics[5]	Radionuclides[6]
20	Rio Puerco at I-25 - 33RPuerc004.6	33RPuerc004.6	Rio Puerco (non-pueblo Rio Grande to Arroyo Chico)	1		8	8		6	6	6	8	2	2	2
21	Rio Puerco at I-40 - 33RPuerc102.2	33RPuerc102.2	Rio Puerco (non-pueblo Rio Grande to Arroyo Chico)	2		4	4		4	4	4	4			
22	Rio Puerco blw WWTP at Sanchez Property - 33RPuerc241.8	33RPuerc241.8	Rio Puerco (Arroyo Chijuilla to northern bnd Cuba)	1	8		8		6	6	6	8	2	2	2
23	Rio San Jose abv Unnamed Arroyo - 36RSanJo119.6	36RSanJo119.6	Rio San Jose (non-tribal HWY 117 to Grants BNSF RR crossing)	1	8		8		6	6	6	8	2	2	2
24	Rio San Jose at Hwy 117 - 36RSanJo111.0	36RSanJo111.0	Rio San Jose (non-tribal HWY 117 to Grants BNSF RR crossing)	1	8		8		6	6	6	8	2	2	2
25	Rito de los Pinos at USFS gate on FR 95 - 33RPinos006.8	33RPinos006.8	Rito de los Pinos (Arroyo San Jose to headwaters)	2	4		4		4	4	4	4			
26	Rito Leche at Cubita Rd. - 33RLeche001.3	33RLeche001.3	Rito Leche (Rio Puerco to Hwy 126)	2	4		4		4	4	4	4			
27	Rito Leche at Hwy 126 - 33RLeche002.6	33RLeche002.6	Rito Leche (Intermittent reaches above HWY 126)	2	4		4		4	4	4	4			
28	Senorito Creek abv Nacimiento Mine - 33Senori008.8	33Senori008.8	Senorito Creek (Nacimiento Mine to headwaters)	1	8		8		6	6	6	8	2	2	2
29	Senorito Creek blw Nacimiento Mine - 33Senori006.8	33Senori006.8	Senorito Creek (San Pablo Canyon to Nacimiento Mine)	1	8		8		6	6	6	8	2	2	2

Map #	Station Name	Station ID	Assessment Unit	PRIORITY[1]	TDS/TSS	TDS/TSS/SO4-/Cl-	Nutrients[2]	Nutrients (high P)	Dissolved Organic Carbon (DOC)	Total Metals[3]	Dissolved Metals[4]	*E. coli*	Volatile Organics[5]	Semi-Volatile Organics[5]	Radionuclides[6]
Quality Control		Blanks Collected per QAPP			13	2	12	2	11		10	14	2		
Total					147	18	146	18	123	106	116	164	22	20	20

[1]Priority rankings: 1 are highest priorities, and 2 the lowest. "L" are lake stations; "IO" are lake inlets or outlets.
[2]Suite includes total Kjeldahl nitrogen, nitrate+nitrite, ammonia and total phosphorus. QC blanks are collected with the "Nutrients (low P)" suite.
[3] Suite includes aluminum, mercury, 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. .
[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.

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.

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 SOP 11.4 – Fish Community Sampling. Macroinvertebrate sampling is conducted in accordance with 11.2 – Benthic Macroinvertebrates. Biological sampling is 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.

SWQB will deploy sondes and data loggers at select river/stream sites for a minimum of 7 days to record specific conductance, dissolved oxygen, turbidity, or pH fluctuations. Please refer to the most up-to-date CALM for more information on minimum deployment intervals regarding the assessment of specific parameters. SWQB will deploy sondes in accordance with SOP 6.2 – Sonde Deployment. Thermographs (water temperature data loggers) are generally deployed from May through September in targeted AUs to measure temperature fluctuations. Thermographs will be deployed in accordance with 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 potential 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 the development and refinement of biological and habitat criteria. **Table 7** summarizes the biological and habitat sampling planned for this survey. The Priority column of **Table 7** documents the chemical sampling priority for each sampling station. The numbers listed within the analyte columns describe the type and number of data collection events planned for each station during the 2021-2022 survey. Flow, water quality, and temperature data will be used from USGS gages where possible. The footnotes to **Table 7** contain more detailed information.

Sonde/DO/conductivity logger deployments described in **Table 7** are planned in accordance with the data requirements identified in the current 2019 CALM (NMED/SWQB 2019a). Revision of the CALM in 2021 may lead to changes in sampling methods or the sampling schedule. Any resulting changes to the FSP will be documented in the 2022 revision of this FSP or in the survey report.

Table 7. Rio Puerco, Rio San Jose, and Little Colorado Watershed Survey: Biological and Habitat Sampling

Map #	Station Name	Station ID	Assessment Unit	PRIORITY[1]	Sonde/DO/Cond[2]	Thermograph	Flow	Physical Habitat	Chlorophyll a[3]	Phytoplankton[3]	Microcystin[3,4]	Macro-invertebrates	Fish
1	Bluewater Creek above Bluewater Lake at USGS gage 8341300 - 36Bluewa018.9	36Bluewa018.9	Bluewater Creek (Perennial prt Bluewater Rsvr to headwaters)	1	S	1	8					1	1
2	BLUEWATER CREEK AT MOUTH OF BLUEWATER CANYON - 36Bluewa003.5	36Bluewa003.5	Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	1		1	8						
3	Bluewater Creek blw Dam - 36Bluewa016.7	36Bluewa016.7	Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	IO			4						
4	Bluewater Creek blw Restoration - 36Bluewa002.5	36Bluewa002.5	Bluewater Creek (Perennial prt R San Jose to Bluewater Rsvr)	2		2	4						
5	BLUEWATER LAKE AT DAM - 36BluWaterLkDm	36BluWaterLkDm	Bluewater Lake	L					4	4	2		
6	BLUEWATER LAKE NEAR PINE CANYON - 36BluWaterLkSh	36BluWaterLkSh	Bluewater Lake	L					4	4	2		

Map #	Station Name	Station ID	Assessment Unit	PRIORITY[1]	Sonde/DO/Cond[2]	Thermograph	Flow	Physical Habitat	Chlorophyll a[3]	Phytoplankton[3]	Microcystin[3,4]	Macro-invertebrates	Fish
7	Cuba WWTP effluent - NM0024848	NM0024848	Rio Puerco (Arroyo Chijuilla to northern bnd Cuba)	2									
8	Gallup WWTP - NM0020672	NM0020672	Puerco River (non-tribal AZ border to Gallup WWTP)	2									
9	La Jara Creek abv irrigation diversion - 33LaJara009.7	33LaJara009.7	La Jara Creek (Perennial reaches abv Arroyo San Jose)	1		1	8						
10	Largo Creek abv Quemado Lake - 74LargoC071.5	74LargoC071.5	Largo Creek (Carrizo Wash to headwaters)	IO			4						
11	Largo Creek blw Quemado Reservoir - 74LargoC068.2	74LargoC068.2	Largo Creek (Carrizo Wash to headwaters)	IO			4						
12	Nacimiento Creek at Eureka Rd. - 33Nacimi008.0	33Nacimi008.0	Nacimiento Ck (Perennial prt HWY 126 to Clear Creek)	1	S	1	8						
13	Puerco River at Allison Road - 76Puerco036.6	76Puerco036.6	Puerco River (Gallup WWTP to South Fork Puerco R)	1			8						
14	Puerco River at CR -1 - 76Puerco029.1	76Puerco029.1	Puerco River (non-tribal AZ border to Gallup WWTP)	1			8						
15	Quemado Dam - 74QuemadoDam	74QuemadoDam	Quemado Lake	L					4	4	2		
16	RAMAH Reservoir DEEP Near DAM - 75RamahLKDeep	75RamahLKDeep	Ramah Reservoir	L					4	4	2		
17	Rio Puerco abv WWTP - 33RPuerc244.0	33RPuerc244.0	Rio Puerco (Arroyo Chijuilla to northern bnd Cuba)	1			8						
18	Rio Puerco at CR13 Bridge - 33RPuerc256.0	33RPuerc256.0	Rio Puerco (Perennial prt northern bnd Cuba to headwaters)	1			8	1					

Map #	Station Name	Station ID	Assessment Unit	PRIORITY[1]	Sonde/DO/Cond[2]	Thermograph	Flow	Physical Habitat	Chlorophyll a[3]	Phytoplankton[3]	Microcystin[3,4]	Macro-invertebrates	Fish
19	Rio Puerco at Hwy 279 Bridge near San Luis - 33RPuerc198.4	33RPuerc198.4	Rio Puerco (non-pueblo Arroyo Chico to Arroyo Chijuilla)	2			4						
20	Rio Puerco at I-25 - 33RPuerc004.6	33RPuerc004.6	Rio Puerco (non-pueblo Rio Grande to Arroyo Chico)	1			8						
21	Rio Puerco at I-40 - 33RPuerc102.2	33RPuerc102.2	Rio Puerco (non-pueblo Rio Grande to Arroyo Chico)	2									
22	Rio Puerco blw WWTP at Sanchez Property - 33RPuerc241.8	33RPuerc241.8	Rio Puerco (Arroyo Chijuilla to northern bnd Cuba)	1			8						
23	Rio San Jose abv Unnamed Arroyo - 36RSanJo119.6	36RSanJo119.6	Rio San Jose (non-tribal HWY 117 to Grants BNSF RR crossing)	1			8						
24	Rio San Jose at Hwy 117 - 36RSanJo111.0	36RSanJo111.0	Rio San Jose (non-tribal HWY 117 to Grants BNSF RR crossing)	1		1	8						
25	Rito de los Pinos at USFS gate on FR 95 - 33RPinos006.8	33RPinos006.8	Rito de los Pinos (Arroyo San Jose to headwaters)	2		1	4						
26	Rito Leche at Cubita Rd. - 33RLeche001.3	33RLeche001.3	Rito Leche (Rio Puerco to Hwy 126)	2			4						
27	Rito Leche at Hwy 126 - 33RLeche002.6	33RLeche002.6	Rito Leche (Intermittent reaches above HWY 126)	2		1	4						
28	Senorito Creek abv Nacimiento Mine - 33Senori008.8	33Senori008.8	Senorito Creek (Nacimiento Mine to headwaters)	1			8						
29	Senorito Creek blw Nacimiento Mine - 33Senori006.8	33Senori006.8	Senorito Creek (San Pablo Canyon to Nacimiento Mine)	1		1	8						
Totals					2	10	144	1	16	16	8	1	1

[1]Priority rankings: 1 are the highest priorities, and 2 the lowest. "L" are lake stations; "IO" are lake inlets or outlets.

[2]Sondes, conductivity loggers, or DO loggers are deployed at sites previously listed for pH, specific conductance, DO, turbidity, or nutrient enrichment or suspected to have excursions for these parameters. Logger types = S (sonde), D (DO logger), or C (conductivity logger).
[3]Chlorophyll-a, phytoplankton, and microcystin samples are collected at lake monitoring locations.
[4]If resources permit, up to 2 additional sites may be sampled for microcystin in high recreation areas or areas of concern.

6.0 RESOURCE REQUIREMENTS

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

Approximated 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 at least two staff. Biological survey crew maximum requirements are three to four staff surveying one to three sites per day. Staff per diem costs are summarized in **Table 10**. Staff receive $85 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, and habitat sampling/monitoring equipment. Total costs for the survey are summarized in **Table 11**.

Table 8. Biological and Chemical Cost Summary for the Rio Puerco, Rio San Jose, and Little Colorado River Watershed Survey

Analyte	Total # of Samples	Cost per Sample (WTU or $)	Total Expenditure (WTU or $)
TDS/TSS	147	45	6615
TDS/TSS/SO4/Cl-	18	105	1890
Nutrients	146	100	14600
Nutrients (low P)	18	95	1710
DOC	123	30	3690
Total Metals	106	85	9010
Dissolved Metals	116	140	16240
E. Coli	164	$7.55	$1238.20
Volatile Organics	22	150	3300
Semi-Volatile Organics	20	235	4700
Radionuclides	20	520	10400
Chlorophyll a	16	$32	512
Phytoplankton	16	$128	$2048
Microcystins	8	$150	$1200
Macroinvertebrates	1	$270	$270
Totals		WTU	72155
		Dollar	$5268.20

Table 9. Vehicle Costs for the Rio Puerco, Rio San Jose, and Little Colorado River Watershed Survey

Month	Approximate Miles	Estimated MPG	Estimated Cost of Gasoline per Gallon	Total Fuel Costs/yr	Total Fuel Costs
March	850	17	$2.50	$125.00	$250.00
April	850	17	$2.50	$125.00	$250.00
May	850	17	$2.50	$125.00	$250.00
June	850	17	$2.50	$125.00	$250.00
July	850	17	$2.50	$125.00	$250.00
August	850	17	$2.50	$125.00	$250.00
September	850	17	$2.50	$125.00	$250.00
October	850	17	$2.50	$125.00	$250.00
TOTAL				**$1,000.00**	**$2,000.00**

Table 10. Field Staff Days and Per Diem Costs for the Rio Puerco, Rio San Jose, and Little Colorado River Watershed Survey

Expense	Water Chemistry Surveys	Biological and Habitat Surveys	Data Logger Deployments	Per diem rate	Total/yr	Total
Per Diem (number of days per year)	12	0	0	$85	$1,020	$2,040
Field Staff Days (number of days per year)	32	1	2		35	70

*A field run typically consists of two staff for two to three days

Table 11. Total Cost Estimates for the Rio Puerco, Rio San Jose, and Little Colorado River Watershed Survey

WTUs	Contract Labs $	Supplies $	Fuel $	Per Diem $	Staff Field Days
72,155	$5,268.2	$1,208	$3,529	$2,040	70

7.0 REPORTING

Following completion of the survey and verification and validation of all data collected during the project, SWQB will produce a final survey report summarizing the data collected during the study and describing deviations from the original or amended Field Sampling Plan. 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 Administrative Code (NMAC). 2020. *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/swqb/Standards/

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U.S. Environmental Protection Agency, 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.

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 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 Insufficient or no reliable data and/or information to determine if any designated or existing use is attained. AUs are listed in this category where sufficient data to support an attainment determination for any use are not available, consistent with requirements of the assessment and listing methodology. In order to relay additional information to stakeholders including SWQB staff, Category 3 is further broken down in New Mexico into the following categories:

3A. Limited data (n = 0 to 1) available, no exceedences. AUs are listed in this subcategory when there are no exceedences in the limited data set. These are considered low priority for follow up monitoring.

3B. Limited data (n = 1) available, exceedence. AUs are listed in this subcategory when there is an exceedence 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 USEPA 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 Category 5A (see below) until all TMDLs for each pollutant have been completed and approved by USEPA.

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, USEPA considers flow alteration to be "pollution" vs. a "pollutant."

IR Category 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 Category 5A until TMDLs for all pollutants have been completed and approved by USEPA.

IR Category 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 USEPA for consideration, or the AU will be moved to Category 5A and a TMDL will be scheduled.

IR Category 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 Category 5A and a TMDL will be scheduled. If it is determined that the current designated uses are inappropriate, it will be moved to 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 Category 4C.

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

Organics (semi-volatiles)	Organics (volatiles)
Anthracene	Chlorobenzene
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

Organics (semi-volatiles)	Organics (volatiles)
Indeno(1,2,3-cd)pyrene	
Isophorone	
Methoxychlor	
Metolachlor	
Metribuzin	
Naphthalene	
Nitrobenzene	
N-nitrosodimethylamine	
N-nitroso-di-n-propylamine	
N-nitrosodiphenylamine	
Pentachlorophenol	
Phenanthrene	
Phenol	
Prometryne	
Pyrene	
Pyridine	
Simazine	
trans-Chlordane	