



NEW MEXICO ENVIRONMENT DEPARTMENT

Surface Water Quality Bureau



CANADIAN RIVER AND DRY CIMARRON RIVER

WATERSHEDS

2015-2016

FIELD SAMPLING PLAN - REVISED

3/9/2016

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ACRONYMS

AU	Assessment Unit
BPJ	Best Professional Judgment
CWA	Clean Water Act
DM	Dissolved Metals
DO	Dissolved Oxygen
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
PSRS	Point Source Regulation Section
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAD	Radionuclide
SBD	Stream Bottom Deposits
SLD	Scientific Laboratory Division
SC	Specific Conductance
SOP	Standard Operating Procedure
SVOC	Semi-Volatile Organic Carbon
SWQB	Surface Water Quality Bureau
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TM	Total Metals
TMDL	Total Maximum Daily Load
TRC	Total Recoverable Chlorine
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Carbon
WPS	Watershed Protection Section
WQ	Water Quality
WQCC	Water Quality Control Commission
WQS	Water Quality Standards
WTU	Work Time Unit
WWTP	Wastewater Treatment Plant

INTRODUCTION

The purpose of this revised Field Sampling Plan (Plan) is to provide a detailed description of the second year of a two-year Water Quality Survey to be conducted in the Canadian and Dry Cimarron Rivers from the Colorado border to the Texas and Oklahoma state lines, respectively, during 2016 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 2015). 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 2016) (QAPP). Data will be collected according to the QAPP and the appropriate SWQB Standard Operating Procedures (SOPs) for water quality data collection.

The survey includes the Dry Cimarron River and tributaries from its headwaters near Johnson Mesa to the Oklahoma state line; the Cimarron River and tributaries originating above Eagle Nest Lake and in the Valle Vidal unit of the Carson National Forest; Raton Creek and tributaries extending to Sugarite Canyon State Park and Johnson Mesa; the Vermejo River and tributaries originating on the Vermejo Park Ranch; Ocate Creek and the Mora River and tributaries originating in the Carson and Santa Fe National Forests; Conchas River; Ute Creek; the mainstem of the Canadian River all other major tributaries of interest. Additionally, all major lakes and reservoirs in the watershed will be monitored.

Historic and current land uses in the watersheds include agriculture (range, pasture, and croplands), mining, forest, grassland, residential, shrubland, water, and wetlands. Land ownership in the watershed includes the Bureau of Land Management (BLM), U.S. Forest Service, Bureau of Reclamation (USFS BOR), U. S. Fish and Wildlife Service (USFWS), National Park Service, New Mexico State Parks, New Mexico Department of Game and Fish, and state, tribal, and private parcels. The study area is part of the Arkansas River basin and encompasses approximately 15,655 square miles (40,546 square kilometers) in New Mexico. The watershed is located in Omernick Level III Ecoregion 21 (Southern Rockies) in the headwaters and Level III Ecoregion 26 (Southwest Tablelands) in the lowlands.

The 2000, 2002, and 2006 SWQB water quality surveys of this area 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 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. Based on a variety of factors, selected monitoring locations will be sampled for water quality constituents from 4-12 times over two years, and nutrient and geomorphology data will be collected at least once for each perennial AU. The type of monitoring planned at each site is summarized in Tables 6 and 7.

1.0 PROJECT PERSONNEL

1.1 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.

Table 1. Personnel Roles and Responsibilities

Team Member	Position/Role	Responsibilities
Kris Barrios Monitoring Team Coordinator kristopher.barrios@state.nm.us (505) 827-2621		
Charles Dentino Field Team Supervisor Lakes Coordinator charles.dentino1@state.nm.us (505) 827-0101		<ul style="list-style-type: none"> Coordinate survey planning efforts (integrate the documentation of various team members' information into the field sampling plan and planning spreadsheet);
Vacant Lower Canadian River Basin		<ul style="list-style-type: none"> Coordinate and participate in the collection of chemical, biological, and habitat data including sonde and thermograph data collection efforts;
Doug Eib Lower Canadian River Basin doug.eib@state.nm.us (505) 827-0106	MASS Project Coordinators	<ul style="list-style-type: none"> Manage data for study (forms, data entry, data verification and analysis);
Seva Joseph Upper Canadian/Dry Cimarron River Basins seva.joseph@state.nm.us (505) 827-0753		<ul style="list-style-type: none"> Prepare final survey report integrating information from all team members.
Gary Schiffmiller Upper Canadian/Dry Cimarron River Basins gary.schiffmiller@state.nm.us (505) 827-2470		
Kristine Pintado kristine.pintado@state.nm.us (505) 827-2822	Standards Liaison	<ul style="list-style-type: none"> Provide information and data needs pertaining to water quality standards development and refinement located within the study area.
Jennifer Foote Jennifer.Foote@state.nm.us (505) 827-0596	Point Source Regulation Section	<ul style="list-style-type: none"> Provide information and data needs pertaining to point source discharges located within the study area;
Barbara Cooney barbara.cooney@state.nm.us (505) 827-0212	(PSRS) Liaisons	<ul style="list-style-type: none"> Assist with development of final survey report, as needed.

Greg Kaufman
greg.kaufman@state.nm.us
(505) 476-4300

Watershed
Protection Section
(WPS) Liaisons

- Provide information and data needs pertaining to nonpoint sources of pollution and BMPs located within the study area.
- Assist with development of final survey report, as needed.

Heidi Henderson
heidi.henderson@state.nm.us
(505) 827-2901

TMDL Liaison

- Provide information and data needs pertaining to TMDL development to be conducted in the study area;
 - Assist with development of final survey report, as needed; and
 - Develop TMDLs as needed.
-

1.2 Organization

For the responsibilities defined in this project, the Project Coordinators, Standards liaison and Total Maximum Daily Load (TMDL) liaison report to the MASS Program Manager. The Point Source Regulation Section (PSRS) liaison reports to the PSRS Program Manager. The Watershed Protection Section (WPS) Liaison reports to the WPS Program Manager. Program Managers report to the SWQB Chief.

2.0 PROJECT DESCRIPTION

2.1 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, wasteload allocations, and TMDLs. The current §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 2014) (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 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 Plan are focused toward meeting the goals of the most recent, EPA-approved IR (NMED/SWQB 2014). Impairments for AUs in this survey area (Table 2) were identified during SWQB's most recent surveys of this watershed, conducted in 2002 and 2006, and include data from a variety of other investigations. "IR Category" column provides the current AU's status in the IR (see Appendix A for definitions). "Water Quality Segment" provides the applicable WQS segment 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 2013). The purpose of 20.6.4 NMAC is to establish WQS that consist 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 Status" column either provides the EPA TMDL-approval date, or states "303(d) List" if a TMDL has not yet been developed for a particular AU-pollutant pair.

Monitoring of surface waters currently across the State has traditionally occurred on an eight-year rotational watershed approach, meaning a given waterbody is generally surveyed intensively, on average, every eight years. Monitoring occurs during the non-winter months (March through November); focuses on physical, chemical, and biological conditions in perennial waters; and includes sampling for most pollutants that have numeric and/or narrative criteria in the WQS. Each assessment unit is represented by a small number of monitoring stations (often only one), each of which receives 4–8 site visits during the survey.

SWQB is testing a new strategy during the 2015-2016 seasons where a larger area is monitored over a longer period of time, with 2-6 water chemistry samples collected at each AU per year (4-12 total samples over the entire survey). Through public outreach, inter-agency coordination, and a scoring system taking into account a variety of factors, a three tier monitoring system – primary, secondary, and tertiary – was developed to prioritize AUs. High ranking priority waters (primary AUs) will receive the greatest amount of monitoring, whereas low ranking waters (i.e., tertiary AUs) will receive the least. This two year monitoring will allow more data to be collected from the highest priority waters to better capture inter-annual variability due to hydrologic conditions during sampling events.

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. 2015) and are opened for the EPA and the public to review and comment as part of the update process. Waterbodies determined to be impaired are reported as such every even year (e.g. 2016) on the State's IR List and TMDLs or TMDL alternatives are developed for listed AUs.

Table 2. Impairment and TMDL Status of Survey Assessment Units (NMED/SWQB 2014)

Assessment Unit	Water Quality Segment	Impairments	IR Category	TMDL Status
Dry Cimarron River				
Carrizozo Creek (Oklahoma Boundary to Headwaters)	20.6.4.702	None	3/3A	None
Dry Cimarron River (Perennial reaches OK boundary to Long Canyon)	20.6.4.702	Dissolved oxygen Temperature	5/5C	303(d) List
Dry Cimarron River (Perennial reaches OK boundary to Long Canyon)	20.6.4.702	Sulfates Total Dissolved Solids	5/5C	TMDL Completed 2009
Dry Cimarron River (Long Canyon to Oak Creek)	20.6.4.702	E. coli Total Dissolved Solids	4A	TMDL Completed 2009
Long Canyon (Perennial reaches above Dry Cimarron River)	20.6.4.702	Selenium E. coli	4A	TMDL Completed 2009
Dry Cimarron River (Oak Creek to Headwaters)	20.6.4.701	None	1	None
Oak Creek (Dry Cimarron River to Headwaters)	20.6.4.701	E. coli Nutrient/Eutrophication	4A	TMDL Completed 2009
Archuleta Creek (Dry Cimarron River to Headwaters)	20.6.4.99	None	3	None
Upper Canadian River: Valle Vidal Unit				
North Shuree Pond	20.6.4.314	None	1	None
Middle Ponil Creek (Greenwood Creek to Headwaters)	20.6.4.309	Nutrient/Eutrophication	4A	TMDL Completed 2011
Middle Ponil Creek (South Ponil to Greenwood Creek)	20.6.4.309	Benthic macroinvertebrate Temperature	5/5C	303(d) List
Greenwood Canyon (Middle Ponil Creek to Headwaters)	20.6.4.309	Aluminum	5/5C	303(d) List
South Ponil Creek (Middle Ponil Creek to Headwaters)	20.6.4.309	None	1	None
South Ponil Creek (Ponil Creek to Middle Ponil Creek)	20.6.4.309	Temperature	4A	TMDL Completed 2010

Assessment Unit	Water Quality Segment	Impairments	IR Category	TMDL Status
North Ponil Creek (Seally Canyon to headwaters)	20.6.4.309	Aluminum Gross alpha Radium 226 & 228 Temperature Turbidity	5/5A	303(d) List
North Ponil Creek (South Ponil Creek to Seally Canyon)	20.6.4.309	E. coli Nutrient/Eutrophication Temperature Turbidity	5/5A	303(d) List
McCrystal Creek (North Ponil to headwaters)	20.6.4.309	Temperature Turbidity	5/5A	303(d) List
Ponil Creek (US 64 to confluence of North & South Ponil)	20.6.4.309	E. coli Nutrient/Eutrophication Temperature Turbidity	4A	TMDL Completed 2010
Ponil Creek (Cimarron River to US 64)	20.6.4.306	Benthic macroinvertebrate	5/5C	303(d) List
Ponil Creek (Cimarron River to US 64)	20.6.4.306	E. coli	5/5C	TMDL Completed 2010
Upper Canadian River: Cimarron Headwaters				
American Creek (Cieneguilla Creek to Headwaters)	20.6.4.309	None	2	None
Saladon Creek (Cieneguilla Creek to Headwaters)	20.6.4.309	None	3	None
West Agua Fria Creek (Cieneguilla Creek to Headwaters)	206.4.309	None	3	None
Cieneguilla Creek (Eagle Nest Lake to headwaters)	20.6.4.309	E. coli Nutrient/Eutrophication Sedimentation/Siltation Temperature Turbidity	4A	TMDL Completed 2004
Sixmile Creek (Eagle Nest Lake to headwaters)	20.6.4.309	E. coli Nutrient/Eutrophication Temperature Turbidity	4A	TMDL Completed 2010
Moreno Creek (Eagle Nest Lake to headwaters)	20.6.4.309	Nutrient/Eutrophication Temperature	4A	TMDL Completed 2010
Eagle Nest Lake	20.6.4.315	Arsenic, dissolved Dissolved Oxygen	5/5A	303(d) List
Cimarron River (Turkey Creek to Eagle Nest Lake)	20.6.4.309	Arsenic, dissolved Nutrient/Eutrophication	4A	TMDL Completed 2010
Upper Canadian River: Cimarron Canyon				
Tolby Creek (Cimarron River to Headwaters)	20.6.4.309	None	2	None
Clear Creek (Cimarron River to Headwaters)	20.6.4.309	None	2	None
Ute Creek (Perennial prt Cimarron River to headwaters)	20.6.4.303	E. coli	4A	TMDL Completed 2010
Cimarron River (Cimarron Village to Turkey Creek)	20.6.4.309	Arsenic, dissolved Temperature	4A	TMDL Completed 2010

Assessment Unit	Water Quality Segment	Impairments	IR Category	TMDL Status
Turkey Creek (Cimarron River to Headwaters)	20.6.4.309	None	3	None
Bonito Creek (Rayado Creek to Headwaters)	20.6.4.309	None	3/3A	None
Rayado Creek (Miami Lake Diversion to headwaters)	20.6.4.309	E. coli Temperature	4A	TMDL Completed 2010
Rayado Creek (Cimarron River to Miami Lake Diversion)	20.6.4.307	Nutrient/Eutrophication Sedimentation/Siltation	4A	TMDL Completed 2010
Cimarron River (Canadian River to Cimarron Village)	20.6.4.306	Nutrient/Eutrophication	4A	TMDL Completed 2010
Springer Lake	20.6.4.317	Mercury in fish tissue	5/5C	303(d) List
Upper Canadian River				
Lake Maloya	20.6.4.312	Temperature	5/5C	303(d) List
Lake Alice	20.6.4.311	None	2	None
Chicorica Creek (East Fork Chicorica to Headwaters)	20.6.4.305	None	1	None
Chicorica Creek (Canadian River to East Fork Chicorica)	20.6.4.305	None	1	None
East Fork Chicorica (Chicorica Creek to Headwaters)	20.6.4.305	None	1	None
Uña de Gato Creek (HWY 64 to headwaters)	20.6.4.305	Nutrient/Eutrophication	4A	TMDL Completed 2011
Uña de Gato Creek (Chicorica Creek to HWY 64)	20.6.4.305	Nutrient/Eutrophication	4A	TMDL Completed 2011
Hunter Creek (Uña de Gato Creek to Headwaters)	20.6.4.305	None	3	None
Doggett Creek (Raton Creek to Headwaters)	20.6.4.99	None	3	None
Raton Creek (Chicorica Creek to headwaters)	20.6.4.305	E. coli Nutrient/Eutrophication	5/5A	303(d) List
Tinaja Creek (Canadian River to Headwaters)	20.6.4.98	None	3/3A	None
Maxwell Lake #13	20.6.4.99	None	1	None
Stubblefield Lake	20.6.4.99	Mercury in fish tissue	5/5C	303(d) List
Canadian River (Cimarron River to CO Border)	20.6.4.305	Nutrient/Eutrophication	4A	2011
Canadian River (Mora River to Cimarron River)	20.6.4.305	None	1	None

Upper Canadian River: Vermejo River

Assessment Unit	Water Quality Segment	Impairments	IR Category	TMDL Status
Caliente Canyon (Vermejo River to Headwaters)	20.6.4.309	Specific Conductance	4A	TMDL Completed 2009
Leandro Creek (Vermejo River to Headwaters)	20.6.4.309	None	3	None
VanBremmer Creek (HWY 64 to headwaters)	20.6.4.309	Temperature Turbidity Specific conductance	5/5B	303(d) List
York Canyon (Vermejo River to headwaters)	20.6.4.309	Specific conductance	5/5C	TMDL Completed 2009
York Canyon (Vermejo River to headwaters)	20.6.4.309	Turbidity	5/5C	303(d) List
Vermejo River (York Canyon to headwaters)	20.6.4.309	Benthic macroinvertebrate Temperature	5/5C	303(d) List
Vermejo River (Rail Canyon to York Canyon)	20.6.4.309	Specific conductance Temperature	4A	TMDL Completed 2009
Vermejo River (Canadian River to Rail Canyon)	20.6.4.305	Low flow alterations	4C	Not a Pollutant
Lower Canadian River: Ocate Creek				
Upper Charette Lake	20.6.4.308	None	1	None
Lower Charette Lake	20.6.4.308	Mercury in fish tissue	5/5C	303(d) List
Wheaten Creek (Manuelas Creek to Headwaters)	20.6.4.309	None	2	None
Manuelas Creek (Wheaten Creek to Headwaters)	20.6.4.309	None	1	None
Ocate Creek (Ocate Village to Wheaten Creek)	20.6.4.309	Low flow alterations	4C	Not a Pollutant
Ocate Creek (Canadian River to Ocate Village)	20.6.4.307	None	2	None
Lower Canadian River: Mora River				
Lujan Canyon (Luna Creek to Headwaters)	20.6.4.309	None	3	None
Luna Creek (Lujan Canyon to Headwaters)	20.6.4.309	None	3/3A	None
Mora River (HWY 434 to Luna Creek)	20.6.4.309	Sedimentation/Siltation Specific Conductance	4A	TMDL Completed 2007
Wolf Creek (Mora River to headwaters)	20.6.4.307	Low flow alterations	4C	Not a Pollutant
Little Coyote Creek (Black Lake to Headwaters)	20.6.4.309	Nutrient/Eutrophication pH	4A	TMDL Completed 2007
Coyote Creek (Black Lake to Headwaters)	20.6.4.309	None	2	None
La Jara Creek (Coyote Creek to Headwaters)	20.6.4.307	None	2	None

Assessment Unit	Water Quality Segment	Impairments	IR Category	TMDL Status
Coyote Creek (Mora River to Black Lake)	20.6.4.309	Specific conductance Temperature	4A	TMDL Completed 2007
Santiago Creek (Rito Cebolla to Headwaters)	20.6.4.307	None	2	None
Morphy Lake	20.6.4.99	None	3/3A	None
Rito Morphy (Rito Cebolla to Headwaters)	20.6.4.307	None	2	None
Rito Cebolla (Mora River to Headwaters)	20.6.4.307	None	2	None
Maestas Creek (Manuelitas Creek to Headwaters)	20.6.4.307	None	3/3A	None
Rito de Gascon (Rito San Jose to Headwaters)	20.6.4.307	None	3/3A	None
Rito San Jose (Manuelitas Creek to Headwaters)	20.6.4.307	Low flow alterations	4C	Not a Pollutant
Manuelitas Creek (Sapello River to Headwaters)	20.6.4.307	None	2	None
Sapello River (Manuelitas Creek to Headwaters)	20.6.4.307	None	2	None
Sapello River (Mora River to Manuelitas Creek)	20.6.4.307	Sedimentation/Siltation	4A	TMDL Completed 2007
Rio la Casa (Mora River to Confluence of North and South Forks)	20.6.4.309	None	2	None
Mora River (USGS Gage East of Shoemaker to HWY 434)	20.6.4.307	Dissolved oxygen Nutrient/Eutrophication	4A	TMDL Completed 2007
Mora River (Canadian River to USGS Gage East of Shoemaker)	20.6.4.305	None	1	None
Lower Canadian River				
Canadian River (Mora River to Cimarron River)	20.6.4.305	None	1	None
Canadian River (Conchas River to Mora River)	20.6.4.305	E. coli	4A	TMDL Completed 2011
Conchas River (Conchas Lake to Headwaters)	20.6.4.305	None	1	None
Conchas Reservoir	20.6.4.304	Mercury in fish tissue	5/5C	303(d) List
Canadian River (Ute Reservoir to Conchas Reservoir)	20.6.4.303	E. coli	4A	TMDL Completed 2011
Pajarito Creek (Canadian River to Headwaters)	20.6.4.303	E. coli Nutrient/Eutrophication	4A	TMDL Completed 2011
Revuelto Creek (Canadian River to Headwaters)	20.6.4.301	Boron	4A	TMDL Completed 2011
Ute Creek (Ute Reservoir to Headwaters)	20.6.4.303	None	1	None

Assessment Unit	Water Quality Segment	Impairments	IR Category	TMDL Status
Ute Reservoir	20.6.4.302	Aluminum Mercury in fish tissue	5/5C	303(d) List
Canadian River (TX Border to Ute Reservoir)	20.6.4.301	None	1	None
Tributaries Reaching the Canadian River in Oklahoma				
Seneca Creek (Perennial Reaches above Clayton Lake)	20.6.4.99	None	2	None
Clayton Lake	20.6.4.316	Mercury in fish tissue	5/5C	303(d) List

2.2 Objectives

Table 3 outlines the project objectives that have been identified to meet the various needs within the SWQB. Data needs have been determined based on impairments from previous studies, identified data gaps, and consultation with 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	Products/ Outcomes	Decision Criteria
Primary Objective	Assess designated use attainment for the <i>Integrated Report</i> and provide information to the public on the condition of surface waters	Are sampled waterbodies meeting WQS criteria?	Integrated Report	WQS as interpreted by the Assessment Protocols
Secondary Objectives	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?	TMDL loading calculations and NPDES permit limits	WQS as interpreted by the Assessment Protocols
	Evaluate restoration and mitigation measures implemented to control NPS pollution	Have watershed restoration activities and mitigation measures improved water quality?	Project Summary Reports, NPS Annual Report, <i>Integrated Report (De-Listing)</i>	WQS as interpreted by the Assessment Protocols
	Develop or refine the WQS	Are the existing uses appropriate for the waterbody?	Use Attainability Analyses (UAA); Amendments to WQS	Are data sufficient to support a petition to the WQCC to revise WQS?

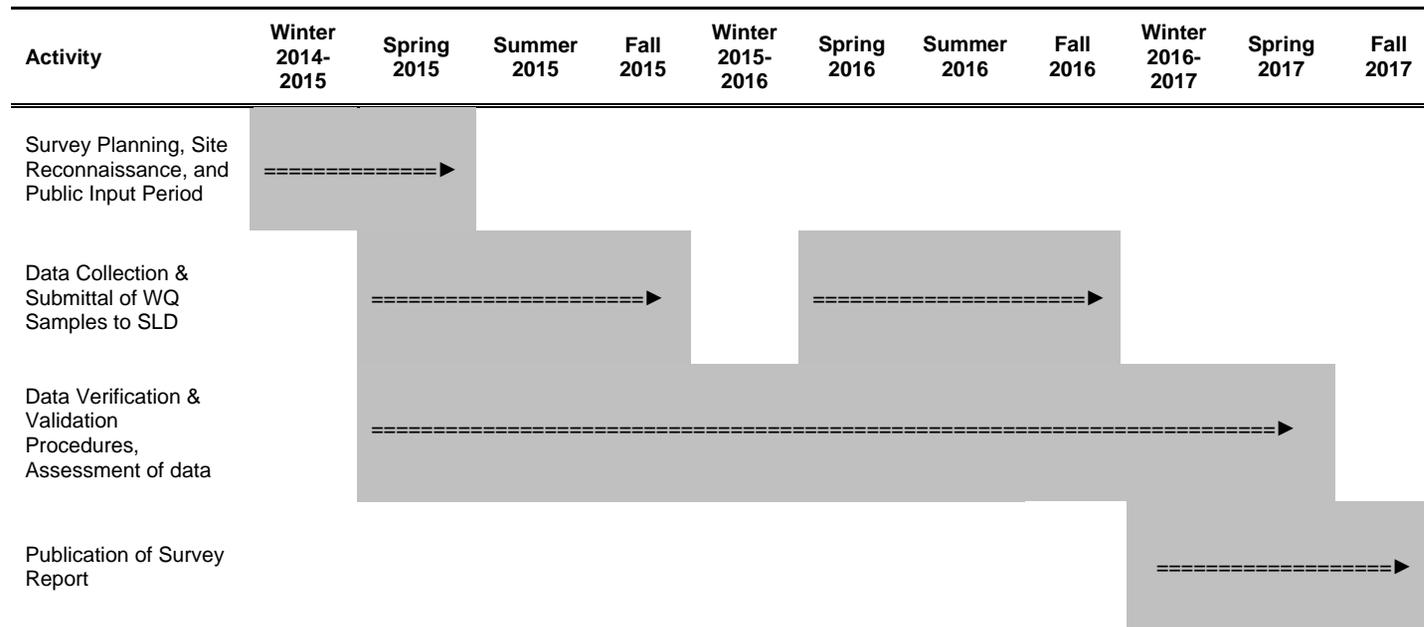
2.3 Schedule

As part of the survey planning process, public meetings are held to receive input on any areas of concern within the AUs surveyed and to inform interested parties about the SWQB water quality survey process, our specific sampling plans in the watershed, and the assessment and TMDL processes. An online opinion survey is also circulated to gauge public interest in specific water segments and pollutants in the survey area.

Water chemistry results typically take several months to return from the analytical laboratory, the New Mexico Scientific Laboratory Division (SLD). When these data are received, they are verified and validated according to SWQB SOPs. Once all data have been received, validated, and verified, the data will be assessed according to assessment protocols in time for incorporation into the 2018-2020 IR List. Once the assessments are complete, the TMDL development process will begin for any identified impairments. TMDLs are tentatively scheduled for completion in fall 2021.

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.

Table 4. Project Schedule



2.4 Location

The survey includes the Dry Cimarron River and tributaries from its headwaters near Johnson Mesa to the Oklahoma state line; and the following Canadian River tributaries: the Cimarron River and tributaries originating above Eagle Nest Lake and in the Valle Vidal unit of the Carson National Forest; Raton Creek and tributaries extending to Sugarite Canyon State Park and Johnson Mesa; the Vermejo River and tributaries originating on the Vermejo Park Ranch; Ocate Creek and the Mora River and tributaries originating in the Carson and Santa Fe National Forests; Conchas River; Ute Creek; and all other major tributaries of interest. Table 5 shows a complete list of stations as presented in Figure 2 – Figure 5.

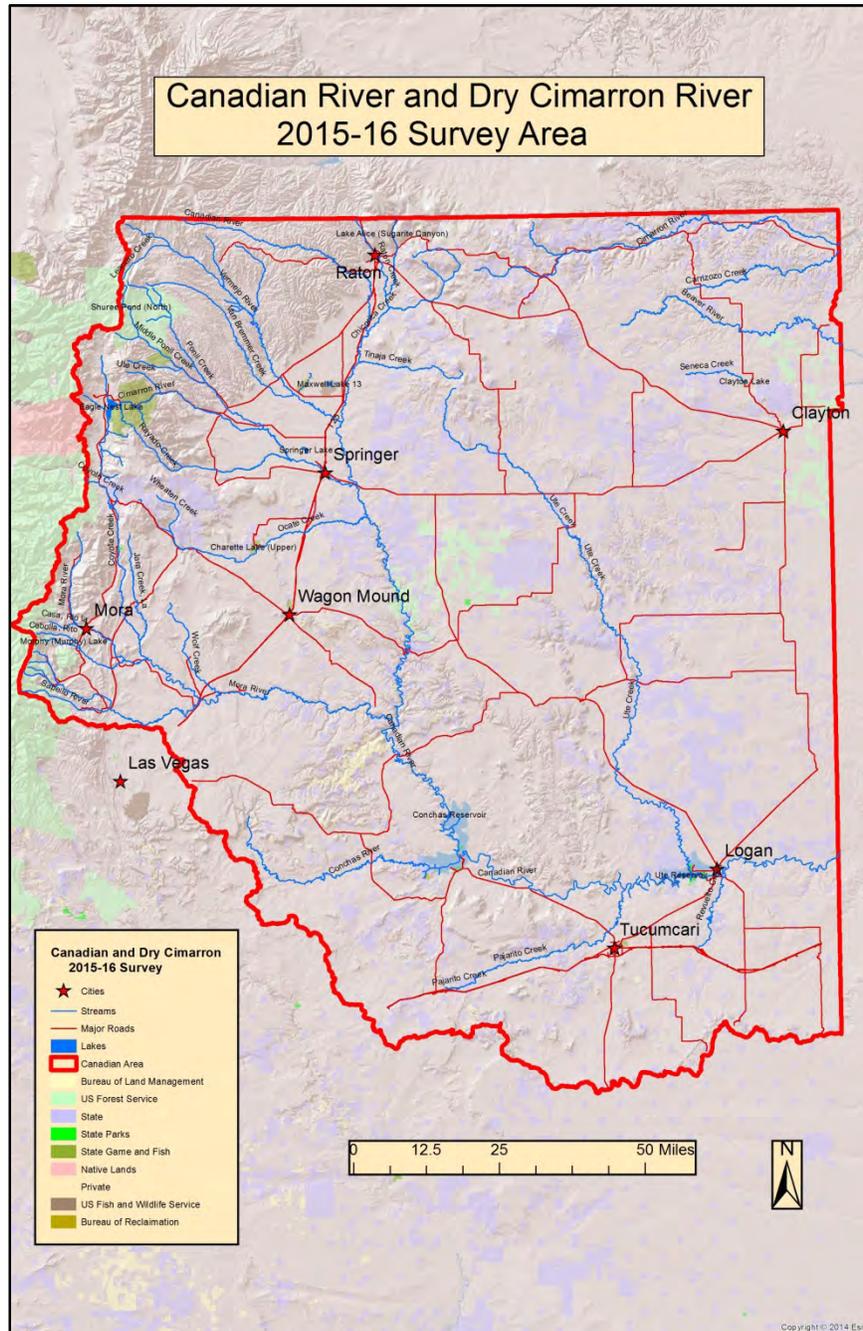


Figure 1. 2015-2016 Survey Area.

Table 5. Water Quality Stations: Canadian and Dry Cimarron Watershed Survey 2015-2016

Map #	Station Name	Station ID	Assessment Unit	Rationale/Comments
1	Carrizozo Creek near NM 406 (DCR 12)	02Carriz002.7	Carrizozo Creek (OK bnd to headwaters)	Only station in AU. Might be ephemeral. Removed sampling. Will continue to document flow conditions.
2	Dry Cimarron River at Wedding Cake Butte	02DryCim024.6	Dry Cimarron R (Perennial reaches OK bnd to Long Canyon)	Only station in AU, impairments.
3	Dry Cimarron River above Long Canyon (DCR 05)	02DryCim074.5	Dry Cimarron River (Long Canyon to Oak Ck)	Only station in AU, impairments.
4	Long Canyon above NM 456 (DCR 06)	02LongCa004.1	Long Canyon (Perennial reaches abv Dry Cimarron)	Only station in AU, impairments.
5	Oak Creek above Dry Cimarron River (DCR 03)	02OakCre000.1	Oak Creek (Dry Cimarron to headwaters)	Only station in AU, impairments. Might be ephemeral. Removed sampling. Will continue to document flow conditions.
6.1	Dry Cimarron River below Folsom Falls - 02DryCim114.9	02DryCim114.9	Dry Cimarron River (Oak Creek to headwaters)	Only station in AU, impairments. Station changed due to better access. This station replaces 113.1. No samples collected at 113.1.
7	North Shuree Pond	05NShureeDeep	Shuree Pond (North)	Recreation Lake.
8	Shuree Creek above North Shuree Pond	05ShurCr000.8	Shuree Pond (North)	Lake Inlet.
9	Shuree Creek below North Shuree Pond	05ShurCr000.6	Shuree Pond (North)	Lake Outlet.
10.1	Middle Ponil Creek @ FR 1910/1914 - 05MPonil019.3	05MPonil019.3	Middle Ponil Creek (South Ponil to Greenwood Creek)	Only station in AU, impairments. Replaces 016.2. Better access
11	Middle Ponil Creek above South Ponil Creek	05MPonil000.1	Middle Ponil Creek (South Ponil to Greenwood Creek)	Only station in AU, impairments.
12	Greenwood Creek above Middle Ponil Creek	05Greenw000.1	Greenwood Canyon (Middle Ponil Creek to headwaters)	Only station in AU, impairments.
13	South Ponil above Middle Ponil Creek	05SPonil008.5	South Ponil Creek (Middle Ponil Creek to headwaters)	Only station in AU, impairments.
14	South Ponil above North Ponil Creek	05SPonil000.1	South Ponil Creek (Ponil Creek to Middle Ponil Creek)	Only station in AU, impairments.
15.1	North Ponil below FR 1950 - 05NPonil027.5	05NPonil027.5	North Ponil Creek (Seally Canyon to headwaters)	Only station in AU, impairments.
16	North Ponil Creek above South Ponil Creek	05NPonil000.1	North Ponil Creek (South Ponil Creek to Seally Canyon)	Only station in AU, impairments.
17	McCrystal Creek at USFS Campground	05McCrys002.0	McCrystal Creek (North Ponil to headwaters)	Only station in AU, impairments.
18	Ponil Creek above NM 64	05PonilC014.9	Ponil Creek (US 64 to confl of North & South Ponil)	Only station in AU, impairments.
19	Ponil Creek above Cimarron River	05PonilC000.1	Ponil Creek (Cimarron River to US 64)	Only station in AU, impairments.

Map #	Station Name	Station ID	Assessment Unit	Rationale/Comments
20	American Creek above Cieneguilla Creek	05Americ000.5	American Creek (Cieneguilla Creek to headwaters)	Only station in AU, impairments.
21	Saladon Creek above Cieneguilla Creek	05Salado000.5	Saladon Creek (Cieneguilla Creek to HW)	Only station in AU, impairments.
22	West Agua Fria Creek above Cieneguilla	05WestAg000.6	West Agua Fria Creek (Cieneguilla Creek to headwaters)	New Station.
23	Cieneguilla Creek at Angel Fire Road	05Cieneg019.3	Cieneguilla Creek (Eagle Nest Lake to headwaters)	Above Angel Fire WWTP.
24	Angel Fire WWTP	NM0030503	Cieneguilla Creek (Eagle Nest Lake to headwaters)	NPDES Sampling.
25	Cieneguilla Creek above Eagle Nest Lake	05Cieneg006.3	Cieneguilla Creek (Eagle Nest Lake to headwaters)	Below Angel Fire WWTP, Impairments
26	Sixmile Creek above US 64	05Sixmil001.4	Sixmile Creek (Eagle Nest Lake to headwaters)	Only station in AU, impairments.
27	Moreno Creek on NM 64	05Moreno003.7	Moreno Creek (Eagle Nest Lake to headwaters)	Only station in AU, impairments.
28	Eagle Nest Lake	05EagleNestDP	Eagle Nest Lake	Recreation Lake.
29.1	Cimarron River at Eagle Nest Outlet - 05Cimarr078.1	05Cimarr078.1	Cimarron River (Turkey Creek to Eagle Nest Lake)	Lake Outlet.
30	Tolby Creek above Cimarron River	05TolbyC000.1	Tolby Creek (Cimarron River to headwaters)	New Station.
31	Clear Creek above Cimarron River	05ClearC000.1	Clear Creek (Cimarron River to headwaters)	New Station.
32	Ute Creek above US 64	05UteCre000.6	Ute Creek (Perennial prt Cimarron River to headwaters)	Only station in AU, impairments.
33	Cimarron River @ NM 21 in Cimarron	05Cimarr044.2	Cimarron River (Cimarron village to Turkey Creek)	Only station in AU, impairments.
34	Cimarron River above Turkey Creek	05Cimarr051.4	Cimarron River (Turkey Creek to Eagle Nest Dam)	Lowest station in AU.
34.1	Turkey Creek above Cimarron River	05Turkey000.1	Turkey Creek (Cimarron River to headwaters)	Added to document flow. No samples scheduled.
36	Rayado Creek at NM 21	05Rayado033.8	Rayado Creek (Miami Lake Diversion to headwaters)	Only station in AU, impairments.
37	Rayado Creek at Miami Lane	05Rayado018.5	Rayado Creek (Cimarron River to Miami Lake Diversion)	Only station in AU, impairments.
38	Cimarron River above Springer WWTP	05Cimarr011.8	Cimarron River (Canadian River to Cimarron Village)	Above Springer WWTP
40	Cimarron River below Springer WWTP	05Cimarr010.4	Cimarron River (Canadian River to Cimarron Village)	Below Springer WWTP lagoons
40.1	Cimarron River below Springer WWTP Ponds - 05Cimarr007.6	05Cimarr007.6	Cimarron River (Canadian River to Cimarron Village)	New station to get below WWTP ponds.
40.2	Cimarron abv Canadian River - 05Cimarr000.5	05Cimarr000.5	Cimarron River (Canadian River to	Lowest station in AU

Map #	Station Name	Station ID	Assessment Unit	Rationale/Comments
Cimarron Village)				
41	Springer Lake	05SpringerLDp	Springer Lake	Recreation Lake.
42	Springer Lake inlet	05SpringerInlet	Springer Lake	Lake Inlet.
43	Springer Lake outlet	05SpringerOutlet	Springer Lake	Lake Outlet.
44	Chicorica Creek above Lake Maloya	04LMaloChicIn	(Lake Maloya to CO border)	Lake Inlet.
44.1	Lake Maloya Inlet at Schwachheim Creek	04LMaloSchwIn	Lake Maloya	Lake Inlet.
45	Lake Maloya	04LMaloyaDeep	Lake Maloya	Recreation Lake.
46.1	Chicorica Creek below Maloya	04Chicor037.3	Chicorica Creek (East Fork Chicorica to headwaters)	Lake Outlet.
47	Chicorica Creek at NM 72	04Chicor029.4	Chicorica Creek (East Fork Chicorica to headwaters)	Lowest station in AU, impariments.
48	East Fork Chicorica Creek above Chicorica Creek	04EFChic001.0	East Fork Chicorica Creek (Chicorica Creek to headwaters)	Only station in AU, impariments.
49	Chicorica Creek below Una de Gato Creek	04Chicor010.9	Chicorica Creek (Canadian River to East Fork Chicorica)	Only station in AU.
49.1	Hunter Creek above Una de Gato	05hunter000.1	Hunter Creek (Throttle Reservoir to headwaters)	Added to document flow. No samples scheduled.
50	Una de Gato Creek above NM 64	04UnaGat013.2	Una de Gato Creek (HWY 64 to headwaters)	Only station in AU, impariments.
51	Una de Gato Creek above Chicorica Creek	04UnaGat000.1	Una de Gato Creek (Chicorica Creek to HWY 64)	Only station in AU, impariments.
52	Doggett Creek above Raton WWTP	04Dogget002.3	Doggett Creek (Raton Creek to headwaters)	Above Raton WWTP
53	Raton WWTP	NM0020273	Raton Creek (Chicorica Creek to headwaters)	NPDES Sampling.
54	Doggett Creek below Raton WWTP	04Dogget002.2	Doggett Creek (Raton Creek to headwaters)	Lowest in AU, below Raton WWTP
55	Raton Creek at McAuliffe Ranch	04RatonC005.1	Raton Creek (Chicorica Creek to hdwtrs)	Only station in AU
56	Tinaja Creek above West Fork Tinaja Creek	04Tinaja010.1	Tinaja Creek (Canadian River to headwaters)	Lowest station in AU, restoration project
56.1	Tinaja Creek above Canadian River	04Tinaja001.9	Tinaja Creek (Canadian River to headwaters)	Normally dry. Samples taken in 2015 when wet.
57	Maxwell Lake 13	04MaxLk13Deep	Maxwell Lake 13	Recreation Lake.
58	Maxwell Lake 13 inlet	MaxLk13InLt	Unassessed Waters	Lake Inlet.
59	Maxwell Lake 13 outlet	04MaxLK13OutL	Unassessed Waters	Lake Outlet.
60	Canadian River at I-25	04Canadi416.5	Canadian River (Cimarron River to CO border)	Possible AU break.
61	Canadian River above Cimarron River	04Canadi352.7	Canadian River (Cimarron River to CO border)	Lowest station in AU, impariments.
62	Canadian River at NM 120	06Canadi274.8	Canadian River (Mora River to Cimarron River)	Only station in AU.

Map #	Station Name	Station ID	Assessment Unit	Rationale/Comments
63	Caliente Canyon above Vermejo River	04Calien000.1	Caliente Canyon (Vermejo River to headwaters)	Only station in AU, impairments.
64.1	Leandro Creek ~5km abv Vermejo River	04Leandr005.7	Leandro Creek (Vermejo River to headwaters)	Lowest station in AU.
65	VanBremmer Creek at NM 64	04VanBre009.4	VanBremmer Creek (HWY 64 to headwaters)	Only station in AU.
66	York Canyon above Vermejo River	04YorkCa000.1	York Canyon (Vermejo River to headwaters)	Only station in AU, impairments, restoration projects.
67	Vermejo River above York Canyon	04Vermej076.0	Vermejo River (York Canyon to headwaters)	Only station in AU, impairments, restoration projects.
67.1	Vermejo River at Juan Baca Canyon - 04Vermej080.2	04Vermej080.2	Vermejo River (York Canyon to headwaters)	Above mine.
67.2	Vermejo River abv Rock Creek - 04Vermej090.5	04Vermej090.5	Vermejo River (York Canyon to North Fork Vermejo River)	Possible AU break.
68	Vermejo River above Rail Canyon	04vermej039.5	Vermejo River (Rail Canyon to York Canyon)	Only station in AU, impairments.
68.1	Vermejo River below confluence with Leandro Creek - 04Vermej094.1	04Vermej094.1	Vermejo River (Rail Canyon to York Canyon)	Possible AU break.
69.1	Vermejo River at I-25	04Vermej002.9	Vermejo River (Canadian River to Rail Canyon)	Lowest station in AU
69.2	Vermejo River (downstream of) Dawson (below conf with Rail) - 04Vermej038.8	04Vermej038.8	Vermejo River (Canadian River to Rail Canyon)	Sampled in 2015. No samples planned for 2016.
70	Lower Charette Lake	06LoCharetteD	Charette Lake (Lower)	Recreation Lake.
71	Lower Charette Lake Inlet	06LoCharInlet	Charette Lake (Lower)	Lake Inlet.
72	Lower Charette Lake Outlet	06LoChareOut	Charette Lake (Lower)	Lake Outlet.
73	Wheaten Creek above Ocate Creek	06Wheate000.8	Wheaten Creek (Manuelas Creek to headwaters)	Only station in AU.
74	Manuelas Creek above Ocate Creek	06Manuel008.7	Manueles Creek (Ocate Creek to headwaters)	Only station in AU.
75	Ocate Creek above Ocate Village	06OcateC063.0	Ocate Creek (Ocate to Wheaten Creek)	Only station in AU.
76	Ocate creek at I-25	06OcateC025.1	Ocate Creek (Canadian River to Ocate)	Only station in AU, impairments.
77	Lujan Canyon above Mora River	07LujanC000.1	Lujan Canyon (Luna Creek to headwaters)	New Station.
78	Luna Creek above Mora River	07LunaCr000.1	Luna Creek (Mora River to headwaters)	New Station.
79	Mora River at Cleveland Village	07MoraRi154.8	Mora River (HWY 434 to Luna Creek)	Only station in AU, above Mora WWTP.
80	Wolf Creek above Mora River	07WolfCr000.6	Wolf Creek (Mora River to headwaters)	Only station in AU, impairments.
81	Coyote Creek above Black Lake	07Coyote057.0	Coyote Creek (Black Lake to headwaters)	Only station in AU.

Map #	Station Name	Station ID	Assessment Unit	Rationale/Comments
82	Little Coyote Creek at NM 434	07LitCoy001.3	Little Coyote Creek (Black Lake to headwaters)	Only station in AU, impairments.
83	La Jara Creek above Coyote Creek	07LaJara016.6	La Jara Creek (Coyote Creek to headwaters)	New station.
84	Coyote Creek at USGS Gage at Thal Ranch	07Coyote004.2	Coyote Creek (Mora River to Black Lake)	Lowest station in AU, impariments.
85	Coyote Creek at Coyote State Park	07Coyote040.0	Coyote Creek (Mora River to Black Lake)	Possible AU break.
86	Santiago Creek at NM 94	07Santia002.3	Santiago Creek (Rito Cebolla to headwaters)	Only station in AU, RGCT stream.
87	Morphy Lake	07MorphyLake2	Morphy (Murphy) Lake	Recreation Lake.
88	Morphy Lake Inlet	07MorphyInlet	Morphy (Murphy) Lake	Lake Inlet.
89	Morphy Lake Outlet	07MorphOutlet	Morphy (Murphy) Lake	Lake Outlet.
90	Rito Morphy above Cebolla Creek	07RMorph001.6	Rito Morphy (Rito Cebolla to headwaters)	Only station in AU, Rio Grande Cutthroat Trout stream.
91	Rito Cebolla at NM 161	07RitoCe000.3	Rito Cebolla (Mora River to headwaters)	Only station in AU.
91.1	Rito Cebolla above hwy 518 - 07RitoCe004.6	07RitoCe004.6	Rito Cebolla (Mora River to headwaters)	Only station in AU.
92	Maestas Creek above Manuelitas Creek	07Maesta000.4	Maestas Creek (Manuelitas Creek to headwaters)	Only station in AU.
93	Rito Gascon above Rito San Jose	07RGasco002.0	Rito de Gascon (Rito San Jose to headwaters)	Only station in AU, possible reference site.
94	Rito San Jose above Manuelitas Creek	07RSanJo000.5	Rito San Jose (Manuelitas Creek to headwaters)	Only station in AU, impairments.
95.1	Manuelitas Creek abv Sapello River	07Manuel000.2	Manuelitas Creek (Sapello River to headwaters)	Lowest station in AU.
95.2	Sparks Ck. abv Maestas Cr. - 07Sparks000.3	07Sparks000.3	Sparks Creek (Maestas Creek to headwaters)	Only station in AU.
95.3	Manuelitas Creek blw Rociada - 07Manuel021.7	07Manuel021.7	Manuelitas Creek (Rito San Jose to Maestas Creek)	Only station in AU.
96	Sapello River at San Ignacio	07Sapell052.4	Sapello River (Manuelitas Creek to headwaters)	Only station in AU.
97	Sapello River at NM 161	07Sapell000.1	Sapello River (Mora River to Manuelitas Creek)	Only station in AU, impairments.
98.1	Rio de la Casa above Mora River	07RioLaC002.8	Rio la Casa (Mora River to confl of North and South Forks)	Lowest station in AU.
99	Mora River at la Cueva	07MoraRi139.9	Mora River (USGS gage east of Shoemaker to HWY 434)	Below Mora WWTP, impairments.
100	Mora WWTP	NM0024996	Mora River (USGS gage east of Shoemaker to HWY 434)	NPDES Sampling.
101	Mora River at Black Willow Ranch	07MoraRi086.0	Mora River (USGS gage east of Shoemaker to HWY 434)	Geomorph site, thermograph deployment.

Map #	Station Name	Station ID	Assessment Unit	Rationale/Comments
102	Mora River at Watrous	07MoraRi094.0	Mora River (USGS gage east of Shoemaker to HWY 434)	Lowest station in AU, impairments.
103	Mora River above Canadian River	07MoraRi000.8	Mora River (Canadian River to USGS gage east of Shoemaker)	Only station in AU, impairments.
104	Canadian River at Mills Canyon	06Canadi305.0	Canadian River (Mora River to Cimarron River)	Reference site.
105	Conchas River at NM 104	08Concha025.1	Conchas River (Conchas Lake to headwaters)	Only station in AU, lake inlet.
106	Trementina Creek below Arroyo Rendia	08Tremen026.2	Unassessed waters with no AU	Only station in AU
107	Conchas Reservoir near Dam	08ConResNrDam	Conchas Reservoir	Recreation lake, public water supply.
108	Conchas Reservoir near Rattlesnake	08ConResNrRat	Conchas Reservoir	Lake arm station.
109	Conchas Reservoir at Canadian River Arm	08ConResCaArm	Conchas Reservoir	Lake arm station.
110	Canadian River at NM 419	06Canadi232.6	Canadian River (Conchas River to Mora River)	Lowest station in AU, lake inlet.
111	Canadian River below Conchas Dam	09Canadi204.1	Canadian River (Ute Reservoir to Conchas Reservoir)	Lake Outlet.
111.1	Conchas outlet at irrigation canal	08ConResOutlr		Lake Outlet.
112.1	Canadian River at NM 104 at milemarker 88 - 09Canadi144.5	09Canadi144.5	Canadian River (Ute Reservoir to Conchas Reservoir)	Lowest station in AU.
113.1	Pajarito Creek Below Noname Creek	09Pajari013.8	Pajarito Creek (Canadian River to headwaters)	Lowest station in AU with access, below Tucumcari WWTP and No Name Creek.
114	Pajarito Creek at NM 104	09Pajari020.0	Pajarito Creek (Canadian River to headwaters)	Above Tucumcari WWTP and No Name Creek.
115	Revuelto Creek above Canadian River	11Revuel003.9	Revuelto Creek (Canadian River to headwaters)	Only station in AU.
116	Tucumcari WWTP	NM0020711		NPDES Sampling.
117	No Name Creek above Pajarito Creek	09NoName002.1	No Name Creek (Pajarito Creek to headwaters)	NPDES Sampling.
117.1	Breen's pond near outlet	09BreensPondNrOutlet		NPDES Sampling.
118	Ute Creek near Logan Village	10UteCre007.5	Ute Creek (Ute Reservoir to headwaters)	Lowest station in AU, lake inlet.
119	Ute Reservoir near Dam	09UteResNrDam	Ute Reservoir	Recreation lake, public water supply.
120	Ute Reservoir near Horseshoe	09UteResAtHor	Ute Reservoir	Lake arm station.
120.1	Ute Reservoir Canadian Arm - 09UteResAtCan	09UteResAtCan	Ute Reservoir	Lake arm station.
121	Ute Reservoir at Ute Creek Arm	09UteResAtUte	Ute Reservoir	Lake arm station.

Map #	Station Name	Station ID	Assessment Unit	Rationale/Comments
122	Ute Creek at NM 102	10UteCre104.3	Ute Creek (perennial prt Bueyeros Ck to Palo Blanco Creek)	Reference site.
123	Ute Creek at Hwy_120	10UteCre150.7	Ute Creek (Perennial prt Bueyeros Ck to Palo Blanco Creek)	Possible AU break. Restoration project.
124	CANADIAN R 1.0 MI BL UTE DAM,NM at hwy 54 near USGS gage	09Canadi062.4	Canadian River (TX border to Ute Reservoir)	Moved lake station closer to dam,
124.1	Canadian River below Ute Dam	09Canadi065.4	Canadian River (TX border to Ute Reservoir)	Lake outlet, restoration project.
125	Canadian River above TX State Line	09Canadi001.2	Canadian River (TX border to Ute Reservoir)	Lowest station in AU, state boundary.
126	Seneca Creek above Clayton Lake	16Seneca043.0	Seneca Creek (Perennial reaches abv Clayton Lake)	Lake inlet, reference site.
127	Clayton Lake	16ClaytonDeep	Clayton Lake	Recreation lake.
128	Seneca Creek at CR 370	16Seneca037.9	Seneca Creek (Perennial reaches below Clayton Lake)	Lake outlet, station moved closer to dam.
128.1	Seneca Creek Blw Clayton Lake - 16Seneca040.2	16Seneca040.2	Clayton Lake	Lake outlet

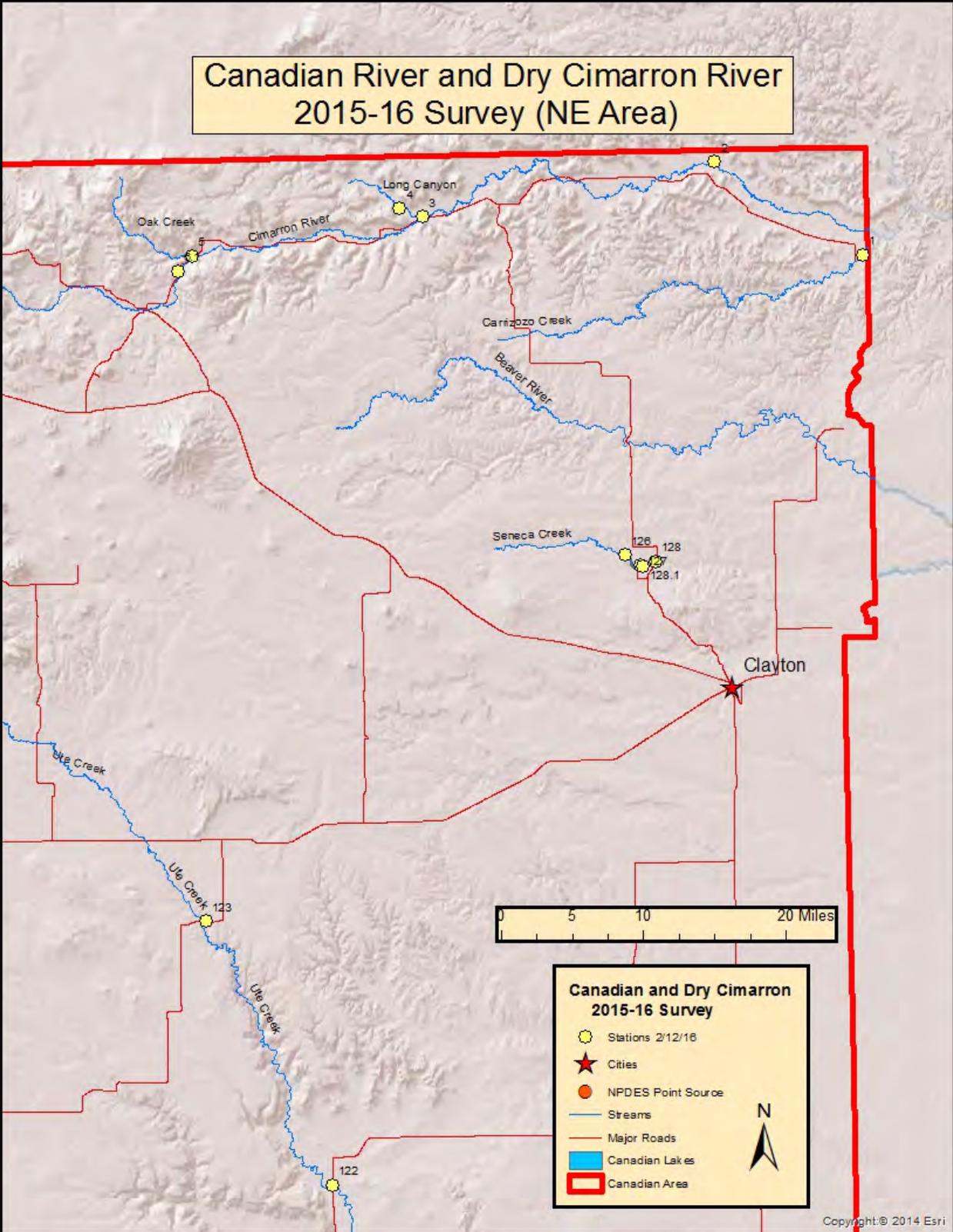


Figure 2. Northeast project area and sampling locations.

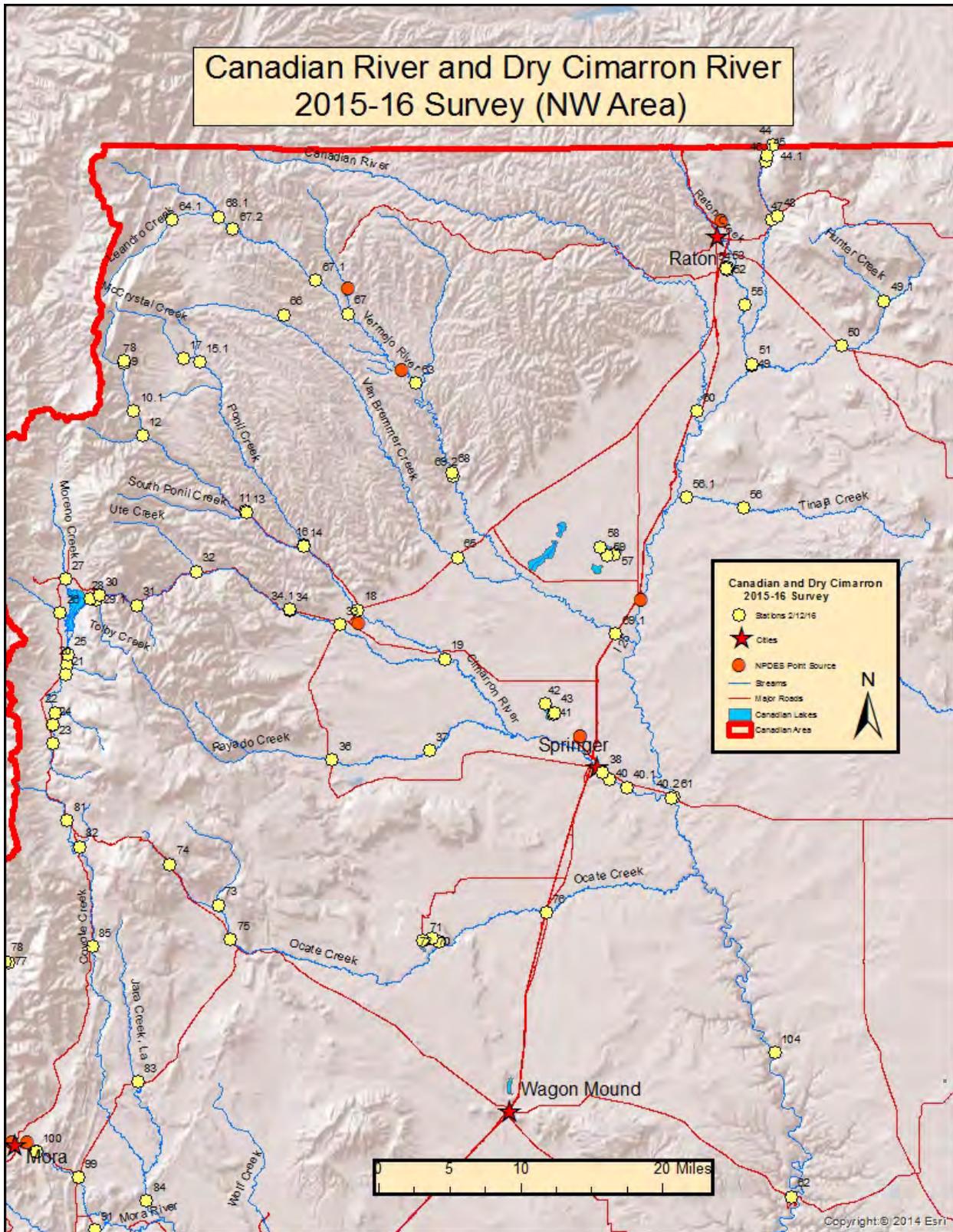


Figure 3. Northwest project area and sampling locations.

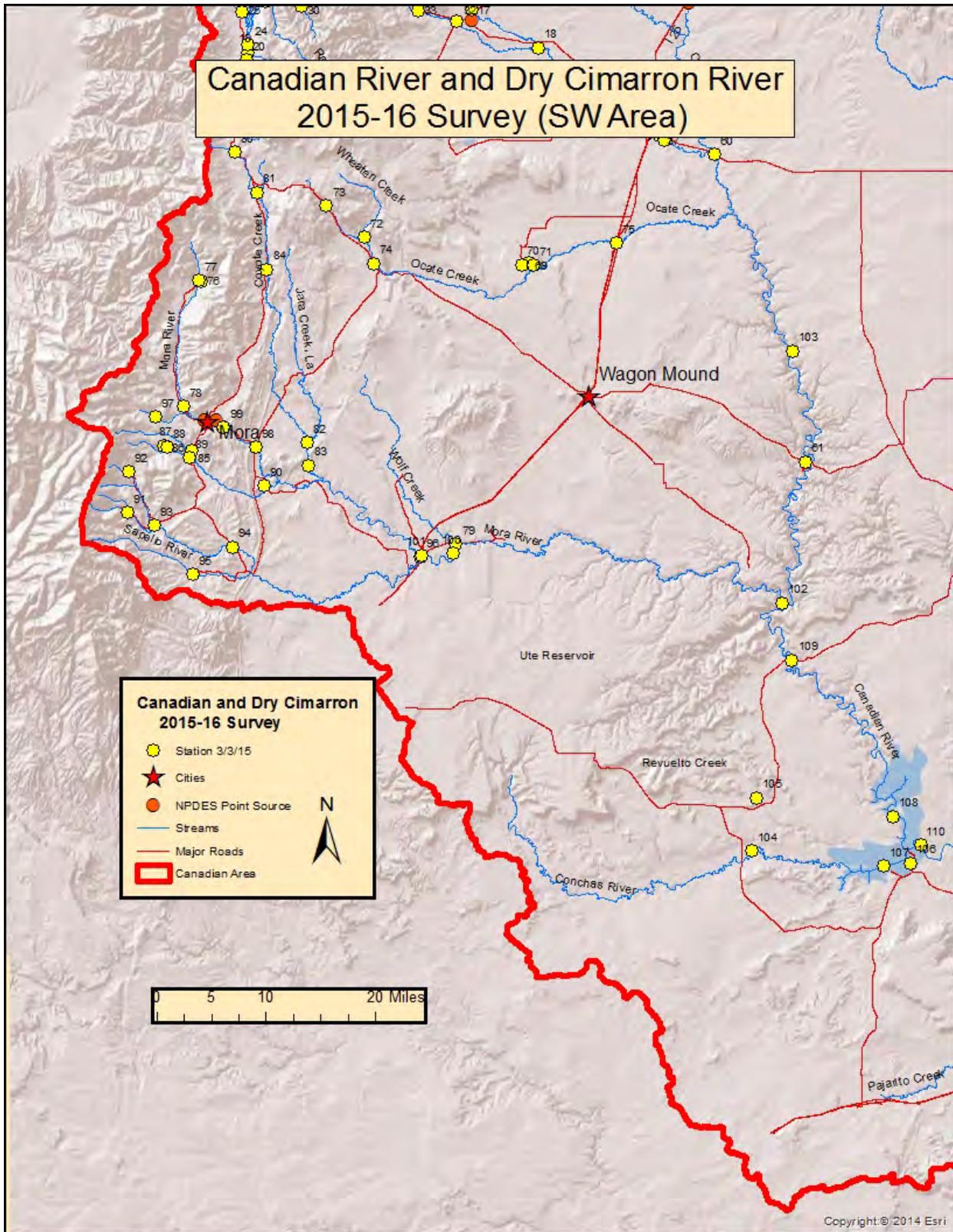


Figure 4. Southwest project area and sampling locations.

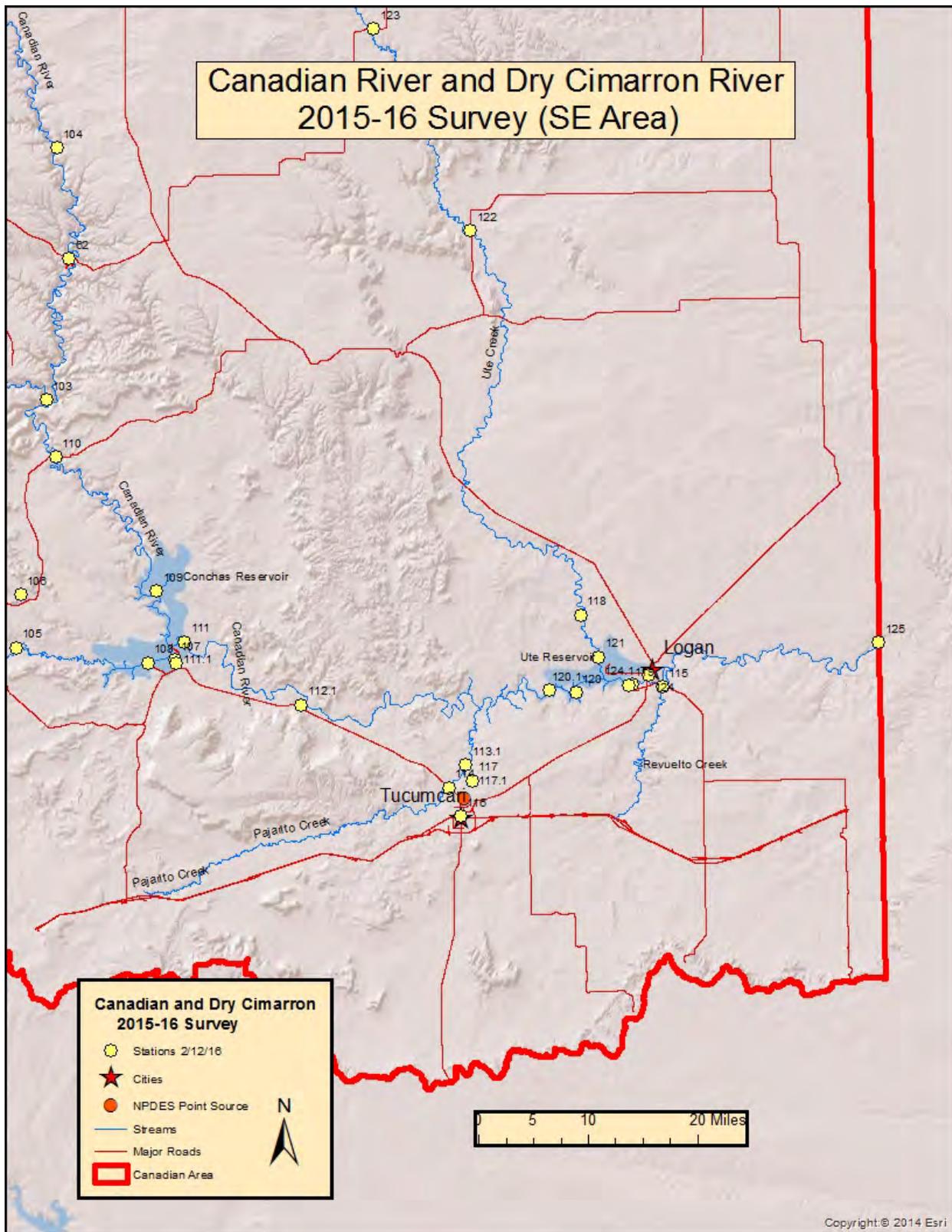


Figure 5. Southeast project area and sampling locations.

3.0 DOCUMENTATION

Project documents include this field sampling plan, probable source sheets, calibration records, field sheets (including sonde and thermograph 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 in electronic form. Documents will be maintained in accordance with the requirements of the SWQB QAPP.

Project documentation will include narrative descriptions of progress throughout the life of the project relating to planning and implementation efforts, including deviations from the original plan and issues that arise along with any associated corrective actions.

Project activities will be documented in SWQB Monitoring Section Field Sheets. Information from field sheets is entered in the SWQB database or maintained in the Project Coordinator's files which are placed in the survey files at the conclusion of the project. Analytical results are electronically transferred into the Bureau's database and eventually moved to US EPA'S Water Quality Exchange database. The project is completed with the finalization of the Survey Report.

4.0 SAMPLING PLAN

4.1 Chemistry Sampling

Water quality samples will be submitted to the SLD or processed in the SWQB laboratory in accordance with procedures as outlined in the SWQB SOPs.

Table 6 outlines water quality analytes to be measured and the sampling frequency for each analyte, for each year of the two-year survey. In addition to the analytes listed, field parameters (temperature, specific conductance, salinity, dissolved oxygen concentration, dissolved oxygen saturation, pH, and turbidity) will be measured at each site using a YSI® or Hydrolab® multi-parameter sonde.

Table 6. 2016 Water Chemistry Sampling Frequency.

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	TDS/TSS	TSS/TDS Chloride, Sulfate	Nutrients ²	Nutrients (low P) ²	Total Metals (Hg, Se, Al)	Dissolved Metals ³	<i>E. coli</i>	Volatile Organic Compounds ⁴	Semi-volatile Organics ⁴	Radionuclides ⁵
2	Dry Cimarron River at Wedding Cake Butte	02DryCim024.6	Dry Cimarron R (Perennial reaches OK bnd to Long Canyon)	1	0	6	0	6	3	3	6	1	1	1
3	Dry Cimarron River above Long Canyon (DCR 05)	02DryCim074.5	Dry Cimarron River (Long Canyon to Oak Ck)	2	0	4	0	4	2	2	4	0	0	0
4	Long Canyon above NM 456 (DCR 06)	02LongCa004.1	Long Canyon (Perennial reaches abv Dry Cimarron)	2	0	4	0	4	2	2	4	0	0	0
6.1	Dry Cimarron River below Folsom Falls	02DryCim114.9	Dry Cimarron River (Oak Creek to headwaters)	2	0	4	0	4	2	2	4	0	0	0
7	North Shuree	05NShureeDeep	Shuree Pond (North)	L	3	0	0	3	1	1	3	0	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	TDS/TSS	TSS/TDS Chloride, Sulfate	Nutrients ²	Nutrients (low P) ²	Total Metals (Hg, Se, Al)	Dissolved Metals ³	<i>E. coli</i>	Volatile Organic Compounds ⁴	Semi-volatile Organics ⁴	Radionuclides ⁵
	Pond													
8	Shuree Creek above North Shuree Pond	05ShurCr000.8	Shuree Pond (North)	IO	3	0	0	3	0	0	3	0	0	0
9	Shuree Creek below North Shuree Pond	05ShurCr000.6	Shuree Pond (North)	IO	3	0	0	3	0	0	3	0	0	0
10.1	Middle Ponil Creek above Greenwood Creek	05MPonil019.3	Middle Ponil Creek (Greenwood Creek to headwaters)	2	4	0	0	4	2	2	4	0	0	0
11	Middle Ponil Creek above South Ponil Creek	05MPonil000.1	Middle Ponil Creek (South Ponil to Greenwood Creek)	2	4	0	0	4	2	2	4	0	0	0
12	Greenwood Creek above Middle Ponil Creek	05Greenw000.1	Greenwood Canyon (Middle Ponil Creek to headwaters)	2	6	0	0	6	6	6	6	0	0	0
13	South Ponil above Middle Ponil Creek	05SPonil008.5	South Ponil Creek (Middle Ponil Creek to headwaters)	3	2	0	0	2	2	2	2	0	0	0
14	South Ponil above North Ponil Creek	05SPonil000.1	South Ponil Creek (Ponil Creek to Middle Ponil Creek)	2	4	0	0	4	2	2	4	0	0	0
15.1	North Ponil Creek above Seally Creek	05NPonil027.5	North Ponil Creek (Seally Canyon to headwaters)	2	4	0	0	4	2	2	4	0	0	4
16	North Ponil Creek above South Ponil Creek	05NPonil000.1	North Ponil Creek (South Ponil Creek to Seally Canyon)	2	4	0	0	4	2	2	4	0	0	0
17	McCrystal Creek at USFS Campground	05McCrys002.0	McCrystal Creek (North Ponil to headwaters)	2	4	0	0	4	2	2	4	0	0	0
18	Ponil Creek above NM 64	05PonilC014.9	Ponil Creek (US 64 to confl of North & South Ponil)	2	4	0	0	4	2	2	4	0	0	0
19	Ponil Creek above Cimarron River	05PonilC000.1	Ponil Creek (Cimarron River to US 64)	2	4	0	0	4	2	2	4	0	0	0
20	American Creek above Cieneguilla Creek	05Americ000.5	American Creek (Cieneguilla Creek to headwaters)	2	4	0	0	4	2	2	4	0	0	0
21	Saladon Creek above Cieneguilla Creek	05Salado000.5	Saladon Creek (Cieneguilla Creek to HW)	2	4	0	0	4	2	2	4	0	0	0
22	West Agua Fria Creek above Cieneguilla	05WestAg000.6	West Agua Fria Creek (Cieneguilla Creek to headwaters)	3	2	0	0	2	2	2	2	0	0	0
23	Cieneguilla Creek at Angel Fire Road	05Cieneg019.3	Cieneguilla Creek (Eagle Nest Lake to headwaters)	1	6	0	0	6	3	3	6	0	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	TDS/TSS	TSS/TDS Chloride, Sulfate	Nutrients ²	Nutrients (low P) ²	Total Metals (Hg, Se, Al)	Dissolved Metals ³	<i>E. coli</i>	Volatile Organic Compounds ⁴	Semi-volatile Organics ⁴	Radionuclides ⁵
24	Angel Fire WWTP	NM0030503	Cieneguilla Creek (Eagle Nest Lake to headwaters)	1	6	0	6	0	3	3	6	0	0	0
25	Cieneguilla Creek above Eagle Nest Lake	05Cieneg006.3	Cieneguilla Creek (Eagle Nest Lake to headwaters)	1	6	0	0	6	3	3	6	1	1	1
26	Sixmile Creek above US 64	05Sixmil001.4	Sixmile Creek (Eagle Nest Lake to headwaters)	2	4	0	0	4	2	2	4	0	0	0
27	Moreno Creek on NM 64	05Moreno003.7	Moreno Creek (Eagle Nest Lake to headwaters)	2	4	0	0	4	2	2	4	0	0	0
28	Eagle Nest Lake	05EagleNestDP	Eagle Nest Lake	L	3	0	0	3	2	2	3	1	1	1
29.1	Cimarron River below Eagle Nest Dam	05Cimarr078.1	Cimarron River (Turkey Creek to Eagle Nest Lake)	IO	3	0	0	3	2	2	3	0	0	0
30	Tolby Creek above Cimarron River	05TolbyC000.1	Tolby Creek (Cimarron River to headwaters)	2	4	0	0	4	2	2	4	0	0	0
31	Clear Creek above Cimarron River	05ClearC000.1	Clear Creek (Cimarron River to headwaters)	2	4	0	0	4	2	2	4	0	0	0
32	Ute Creek above US 64	05UteCre000.6	Ute Creek (Perennial prt Cimarron River to headwaters)	2	4	0	0	4	2	2	4	1	1	1
33	Cimarron River at Cimarron Village	05Cimarr044.2	Cimarron River (Cimarron village to Turkey Creek)	2	4	0	0	4	2	2	4	1	1	1
34	Cimarron River above Turkey Creek	05Cimarr051.4	Cimarron River (Turkey Creek to Eagle Nest Dam)	2	4	0	0	4	2	2	4	0	0	0
36	Rayado Creek at NM 21	05Rayado033.8	Rayado Creek (Miami Lake Diversion to headwaters)	2	4	0	0	4	2	2	4	0	0	0
37	Rayado Creek at Miami Lane	05Rayado018.5	Rayado Creek (Cimarron River to Miami Lake Diversion)	2	4	0	0	4	2	2	4	0	0	0
38	Cimarron River above Springer WWTP	05Cimarr011.8	Cimarron River (Canadian River to Cimarron Village)	1	8	0	0	8	4	4	8	0	0	0
40.1	Cimarron River below Springer WWTP Ponds -	05Cimarr007.6	Cimarron River (Canadian River to Cimarron Village)	1	8	0	0	8	4	4	8	1	1	1
41	Springer Lake	05SpringerLDp	Springer Lake	L	3	0	0	3	1	1	3	1	1	1
42	Springer Lake inlet	05SpringerInlet	Springer Lake	IO	3	0	0	3	0	0	3	0	0	0
43	Springer Lake outlet	05SpringerOutlet	Springer Lake	IO	3	0	0	3	0	0	3	0	0	0
44	Chicorica Creek above Lake Maloya	04LMaloChicIn	(Lake Maloya to CO border)	IO	3	0	0	3	0	0	3	0	0	0
44.1	Lake Maloya Inlet at Schwachheim	04LMaloSchwIn	Lake Maloya	IO	3	0	0	3	0	0	3	0	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	TDS/TSS	TSS/TDS Chloride, Sulfate	Nutrients ²	Nutrients (low P) ²	Total Metals (Hg, Se, Al)	Dissolved Metals ³	<i>E. coli</i>	Volatile Organic Compounds ⁴	Semi-volatile Organics ⁴	Radionuclides ⁵
	Creek													
45	Lake Maloya	04LMaloyaDeep	Lake Maloya	L	3	0	0	3	1	1	3	1	1	1
46.1	Chicorica Creek below Maloya	04Chicor037.3	Chicorica Creek (East Fork Chicorica to headwaters)	IO	3	0	0	3	0	0	3	0	0	0
47	Chicorica Creek above East Fork Chicorica Creek	04Chicor029.4	Chicorica Creek (East Fork Chicorica to headwaters)	3	2	0	0	2	2	2	2	0	0	0
48	East Fork Chicorica Creek above Chicorica Creek	04EFChic001.0	East Fork Chicorica Creek (Chicorica Creek to headwaters)	3	2	0	0	2	2	2	2	0	0	0
49	Chicorica Creek below Una de Gato Creek	04Chicor010.9	Chicorica Creek (Canadian River to East Fork Chicorica)	3	2	0	0	2	2	2	2	0	0	0
50	Una de Gato Creek above NM 64	04UnaGat013.2	Una de Gato Creek (HWY 64 to headwaters)	2	4	0	0	4	2	2	4	0	0	0
51	Una de Gato Creek above Chicorica Creek	04UnaGat000.1	Una de Gato Creek (Chicorica Creek to HWY 64)	2	4	0	0	4	2	2	4	1	1	1
52	Doggett Creek above Raton WWTP	04Dogget002.3	Doggett Creek (Raton Creek to headwaters)	1	6	0	0	6	3	3	6	0	0	0
53	Raton WWTP	NM0020273	Raton Creek (Chicorica Creek to headwaters)	1	6	0	6	0	3	3	6	0	0	0
54	Doggett Creek below Raton WWTP	04Dogget002.2	Doggett Creek (Raton Creek to headwaters)	1	6	0	6	0	3	3	6	0	0	0
55	Raton Creek at McAuliffe Ranch	04RatonC005.1	Raton Creek (Chicorica Creek to hdwtrs)	2	4	0	0	4	2	2	4	1	1	1
56	Tinaja Creek above West Fork Tinaja Creek	04Tinaja010.1	Cimarron River (Canadian River to Cimarron Village)	2	4	0	0	4	2	2	4	0	0	0
57	Maxwell Lake 13	04MaxLk13Deep	Maxwell Lake 13	L	3	0	0	3	1	1	3	1	1	1
58	Maxwell Lake 13 inlet	MaxLk13InLt	Unassessed Waters	IO	3	0	0	3	0	0	3	0	0	0
59	Maxwell Lake 13 outlet	04MaxLK13OutL	Unassessed Waters	IO	3	0	0	3	0	0	3	0	0	0
60	Canadian River at I-25	04Canadi416.5	Canadian River (Cimarron River to CO border)	2	4	0	0	4	2	2	4	0	0	0
61	Canadian River above Cimarron River	04Canadi352.7	Canadian River (Cimarron River to CO border)	2	4	0	0	4	2	2	4	1	1	1
62	Canadian River at NM 120	06Canadi274.8	Canadian River (Mora River to Cimarron River)	2	4	0	0	4	2	2	4	0	0	0
63	Caliente Canyon above Vermejo River	04Calien000.1	Caliente Canyon (Vermejo River to headwaters)	2	6	0	0	6	3	3	6	0	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	TDS/TSS	TSS/TDS Chloride, Sulfate	Nutrients ²	Nutrients (low P) ²	Total Metals (Hg, Se, Al)	Dissolved Metals ³	E. coli	Volatile Organic Compounds ⁴	Semi-volatile Organics ⁴	Radionuclides ⁵
64.1	Leandro Creek ~5km abv Vermejo River	04Leandr005.7	Leandro Creek (Vermejo River to headwaters)	3	4	0	0	4	2	2	4	0	0	0
66	York Canyon above Vermejo River	04YorkCa000.1	York Canyon (Vermejo River to headwaters)	2	4	0	0	4	2	2	4	0	0	0
67.1	Vermejo River at Juan Baca Canyon	04Vermej080.2	Vermejo River (York Canyon to headwaters)	2	6	0	0	6	3	3	6	1	1	1
67.2	Vermejo River abv Rock Creek	04Vermej090.5	Vermejo River (York Canyon to North Fork Vermejo River)	2	6	0	0	6	3	3	6	0	0	0
68	Vermejo River above Rail Canyon	04vermej039.5	Vermejo River (Rail Canyon to York Canyon)	2	6	0	0	6	3	3	6	1	1	1
68.1	Vermejo River below confluence with Leandro Creek	04Vermej094.1	Vermejo River (Rail Canyon to York Canyon)	2	6	0	0	6	3	3	6	1	1	1
69.1	Vermejo River at I-25	04Vermej002.9	Vermejo River (Canadian River to Rail Canyon)	2	6	0	0	6	3	3	6	1	1	1
69.2	Vermejo River (downstream of Dawson (below conf with Rail))	04Vermej038.8	Vermejo River (Canadian River to Rail Canyon)	2	6	0	0	6	3	3	6	1	1	1
70	Lower Charette Lake	06LoCharetteD	Charette Lake (Lower)	L	3	0	0	3	1	1	3	1	1	1
71	Lower Charette Lake Inlet	06LoCharInlet	Charette Lake (Lower)	IO	3	0	0	3	0	0	3	0	0	0
72	Lower Charette Lake Outlet	06LoChareOut	Charette Lake (Lower)	IO	3	0	0	3	0	0	3	0	0	0
73	Wheaten Creek above Ocate Creek	06Wheate000.8	Wheaten Creek (Manuelas Creek to headwaters)	3	2	0	0	2	2	2	2	0	0	0
74	Manuelas Creek above Ocate Creek	06Manuel008.7	Manueles Creek (Ocate Creek to headwaters)	3	2	0	0	2	2	2	2	0	0	0
77	Lujan Canyon above Luna Creek	07LujanC000.1	Lujan Canyon (Luna Creek to headwaters)	3	2	0	0	2	2	2	2	0	0	0
78	Luna Creek above Lujan Canyon	07LunaCr000.1	Luna Creek (Mora River to headwaters)	3	2	0	0	2	2	2	2	0	0	0
79	Mora River at Cleveland Village	07MoraRi154.8	Mora River (HWY 434 to Luna Creek)	1	6	0	0	6	3	3	6	1	1	1
81	Coyote Creek above Black Lake	07Coyote057.0	Coyote Creek (Black Lake to headwaters)	3	2	0	0	2	2	2	2	0	0	0
82	Little Coyote Creek at NM 434	07LitCoy001.3	Little Coyote Creek (Black Lake to headwaters)	2	6	0	0	6	3	3	6	0	0	0
83	La Jara Creek above Coyote Creek	07LaJara016.6	La Jara Creek (Coyote Creek to headwaters)	3	4	0	0	4	2	2	4	0	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	TDS/TSS	TSS/TDS Chloride, Sulfate	Nutrients ²	Nutrients (low P) ²	Total Metals (Hg, Se, Al)	Dissolved Metals ³	<i>E. coli</i>	Volatile Organic Compounds ⁴	Semi-volatile Organics ⁴	Radionuclides ⁵
84	Coyote Creek at USGS Gage at Thal Ranch	07Coyote004.2	Coyote Creek (Mora River to Black Lake)	2	4	0	0	4	2	2	4	1	1	1
85	Coyote Creek at Coyote State Park	07Coyote040.0	Coyote Creek (Mora River to Black Lake)	2	4	0	0	4	2	2	4	0	0	0
87	Morphy Lake	07MorphyLake2	Morphy (Murphy) Lake	L	3	0	0	3	1	1	3	1	1	1
88	Morphy Lake Inlet	07MorphyInlet	Morphy (Murphy) Lake	IO	3	0	0	3	0	0	3	0	0	0
89	Morphy Lake Outlet	07MorphOutlet	Morphy (Murphy) Lake	IO	3	0	0	3	0	0	3	0	0	0
90	Rito Morphy above Cebolla Creek	07RMorph001.6	Rito Morphy (Rito Cebolla to headwaters)	2	4	0	0	4	2	2	4	0	0	0
91.1	Rito Cebolla above hwy 518	07RitoCe004.6	Rito Cebolla (Mora River to headwaters)	3	2	0	0	2	2	2	2	0	0	0
92	Maestas Creek above Manuelitas Creek	07Maesta000.4	Maestas Creek (Manuelitas Creek to headwaters)	3	2	0	0	2	2	2	2	0	0	0
93	Rito Gascon above Rito San Jose	07RGasco002.0	Rito de Gascon (Rito San Jose to headwaters)	2	4	0	0	4	2	2	4	0	0	0
94	Rito San Jose above Manuelitas Creek	07RSanJo000.5	Rito San Jose (Manuelitas Creek to headwaters)	2	6	0	0	6	3	3	6	0	0	0
95.1	Manuelitas Creek abv Sapello River	07Manuel000.2	Manuelitas Creek (Sapello River to headwaters)	3	2	0	0	2	2	2	2	0	0	0
95.2	Sparks Ck. abv Maestas Cr.	07Sparks000.3	Sparks Creek (Maestas Creek to headwaters)	3	2	0	0	2	2	2	2	0	0	0
95.3	Manuelitas Creek blw Rociada	07Manuel021.7	Manuelitas Creek (Rito San Jose to Maestas Creek)	3	2	0	0	2	2	2	2	0	0	0
96	Sapello River at San Ignacio	07Sapell052.4	Sapello River (Manuelitas Creek to headwaters)	2	4	0	0	4	2	2	4	0	0	0
97	Sapello River at NM 161	07Sapell000.1	Sapello River (Mora River to Manuelitas Creek)	2	4	0	0	4	2	2	4	1	1	1
98.1	Rio de la Casa above Mora River	07RioLaC002.8	Rio la Casa (Mora River to confl of North and South Forks)	3	2	0	0	2	2	2	2	0	0	0
99	Mora River at la Cueva	07MoraRi139.9	Mora River (USGS gage east of Shoemaker to HWY 434)	1	6	0	0	6	3	3	6	1	1	1
100	Mora WWTP	NM0024996	Mora River (USGS gage east of Shoemaker to HWY 434)	1	8	0	8	0	4	4	8	0	0	0
101	Mora River at Black Willow Ranch	07MoraRi086.0	Mora River (USGS gage east of Shoemaker to HWY 434)	BH	0	0	0	1	0	0	0	0	0	0
102	Mora River at Watrous	07MoraRi094.0	Mora River (USGS gage east of Shoemaker to HWY 434)	1	6	0	0	6	3	3	6	0	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	TDS/TSS	TSS/TDS Chloride, Sulfate	Nutrients ²	Nutrients (low P) ²	Total Metals (Hg, Se, Al)	Dissolved Metals ³	E. coli	Volatile Organic Compounds ⁴	Semi-volatile Organics ⁴	Radionuclides ⁵
103	Mora River above Canadian River	07MoraRi000.8	Mora River (Canadian River to USGS gage east of Shoemaker)	2	4	0	0	4	2	2	4	1	1	1
104	Canadian River at Mills Canyon	06Canadi305.0	Canadian River (Mora River to Cimarron River)	2	4	0	0	4	2	2	4	1	1	1
105	Conchas River at NM 104	08Concha025.1	Conchas River (Conchas Lake to headwaters)	3	2	0	0	2	2	2	2	0	0	0
106	Trementina Creek below Arroyo Rendia	08Tremen026.2	Unassessed waters with no AU	3	2	0	0	2	2	2	2	0	0	0
107	Conchas Reservoir near Dam	08ConResNrDam	Conchas Reservoir	L	3	0	0	3	1	1	3	1	1	1
108	Conchas Reservoir near Rattlesnake	08ConResNrRat	Conchas Reservoir	L	3	0	0	3	0	0	3	0	0	0
109	Conchas Reservoir at Canadian River Arm	08ConResCaArm	Conchas Reservoir	L	3	0	0	3	0	0	3	0	0	0
110	Canadian River at NM 419	06Canadi232.6	Canadian River (Conchas River to Mora River)	IO	3	0	0	3	0	0	3	1	1	1
111.1	Conchas outlet at irrigation canal	08ConResOutlr canal	Canadian River (Ute Reservoir to Conchas Reservoir)	IO	4	0	0	4	0	0	4	0	0	0
112.1	Canadian River at NM 104 at milemarker 88	09Canadi144.5	Canadian River (Ute Reservoir to Conchas Reservoir)	2	6	0	0	6	3	3	6	2	2	2
113.1	Pajarito Creek Below Noname Creek	09Pajari013.8	Pajarito Creek (Canadian River to headwaters)	1	4	0	0	4	2	2	4	1	1	1
114	Pajarito Creek at NM 104	09Pajari020.0	Pajarito Creek (Canadian River to headwaters)	1	4	0	0	4	2	2	4	0	0	0
115	Revuelto Creek above Canadian River	11Revuel003.9	Revuelto Creek (Canadian River to headwaters)	2	4	0	0	4	2	2	4	1	1	1
116	Tucumcari WWTP	NM0020711	Pajarito Creek (Canadian River to headwaters)	1	4	0	4	0	2	2	4	0	0	0
117.1	Breen's pond near outlet	09BreensPondNrOutlet	No Name Creek (Pajarito Creek to headwaters)	2	4	0	4	0	2	2	4	0	0	0
118	Ute Creek near Logan Village	10UteCre007.5	Ute Creek (Ute Reservoir to headwaters)	IO	3	0	0	3	1	1	3	1	1	1
119	Ute Reservoir near Dam	09UteResNrDam	Ute Reservoir	L	3	0	0	3	1	1	3	1	1	1
120.1	Ute Reservoir near Horseshoe or Canadian Arm	09UteResAtCan	Ute Reservoir	L	4	0	0	4	0	0	4	0	0	0
121	Ute Reservoir at Ute Creek Arm	09UteResAtUte	Ute Reservoir	L	4	0	0	4	0	0	4	0	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	TDS/TSS	TSS/TDS Chloride, Sulfate	Nutrients ²	Nutrients (low P) ²	Total Metals (Hg, Se, Al)	Dissolved Metals ³	<i>E. coli</i>	Volatile Organic Compounds ⁴	Semi-volatile Organics ⁴	Radionuclides ⁵
122	Ute Creek at NM 102	10UteCre104.3	Ute Creek (Ute Reservoir to headwaters)	3	2	0	0	2	2	2	2	0	0	0
124.1	Canadian River below Ute Dam	09Canadi065.4	Canadian River (TX border to Ute Reservoir)	IO	0	4	0	4	2	2	4	0	0	0
125	Canadian River above TX State Line	09Canadi001.2	Canadian River (TX border to Ute Reservoir)	2	0	4	0	4	2	2	4	2	2	2
126	Seneca Creek above Clayton Lake	16Seneca043.0	Seneca Creek (Perennial reaches abv Clayton Lake)	IO	3	0	0	3	0	0	3	0	0	0
127	Clayton Lake	16ClaytonDeep	Clayton Lake	L	3	0	0	3	1	1	3	1	1	1
128.1	Seneca Creek below Clayton Lake	16Seneca040.2	Seneca Creek (TX border to Clayton Lake)	IO	3	0	0	3	0	0	3	0	0	0
	QC		Field, equipment, reagent and bacterial blanks collected per QAPP.		45	5	10	45	-	25	45	6	6	-
Totals				0	497	31	34	490	224	249	523	42	42	40

¹Priority rankings: 1 are highest priorities, and 3 the lowest. "L" are lake stations, "IO" are lake inlets or outlets, "BH" are sites used only for biological/habitat monitoring.

²Suite includes total Kjeldahl nitrogen, nitrate+nitrite, ammonia and total phosphorus. QC blanks are collected with the "Nutrients (low P)" suite.

³Suite includes aluminum, antimony, arsenic, barium, boron, cadmium, chromium, cobalt, copper, iron, manganese, molybdenum, nickel, silicon, silver, tin, vanadium and zinc PLUS calcium and magnesium.

⁴See Appendix B for a complete list of analytes.

⁵A radionuclide sample will include gross alpha and gross beta and depending on detections may include Uranium mass and Radium 226 + 228.

4.2 Physical and Biological Sampling

Measuring biological response indicators concurrent to physical habitat and chemistry gives an overall interpretation of the biological integrity of the reach represented, provides more complete information on characteristics of sediment and nutrients currently cycling through the stream, and may provide enough information to investigate or eliminate specific potential sources of water quality stress. SWQB is currently collecting 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 are conducted in accordance with the SWQB SOPs. Biological sampling is conducted within a biological index period for appropriate comparability of samples and life history requirements. Sondes and Data Loggers are deployed at select sites in the stream for 3-10 days to record dissolved oxygen, turbidity, and pH fluctuations. Thermographs (data logging thermometers) are deployed from May through September in each AU throughout the survey to measure temperature fluctuations.

Resources, access issues, and other issues do not allow for the collection of biological and habitat data at every AU. Stations are selected for biological and habitat monitoring based on 1) current IR status, 2) results of the Level I Nutrient Assessment, 3) observational results of the surrounding land use including upland and riparian habitat conditions, results of the Site Condition Class Verification & Probable Source Field Sheet, and the Rapid Habitat Assessment protocols. Additional sites determined to be in "reference" or "best available condition" will also be selected for biological and habitat monitoring for inclusion in development and refinement of biological and habitat criteria. Table 7 summarizes the biological and habitat sampling that is planned for this survey.

At the time of publication of this document, the Nutrient Assessment Protocol for Wadeable, Perennial Streams was undergoing significant revision. Sampling of Chlorophyll *a*, periphyton-diatoms, and sonde/DO logger deployments described in Table 7 are planned in accordance with the current 2014 Assessment Protocols. Revision of the Assessment Protocol will likely lead to changes in the sampling schedule described in Table 7. MASS project coordinators will post an updated Biological and Habitat Sampling plan when revision to the 2016 Assessment Protocols is complete.

Table 7. Biological and Habitat Sampling for 2016.

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DO Deployment ²	Chlorophyll <i>a</i> ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
1	Carrizozo Creek near NM 406 (DCR 12)	02Carriz002.7	Carrizozo Creek (OK bnd to headwaters)	3	0	0	0	0	0	0	4	0	0
2	Dry Cimarron River at Wedding Cake Butte	02DryCim024.6	Dry Cimarron R (Perennial reaches OK bnd to Long Canyon)	1	1	0	0	0	1	1	6	1	1
3	Dry Cimarron River above Long Canyon (DCR 05)	02DryCim074.5	Dry Cimarron River (Long Canyon to Oak Ck)	2	1	0	0	0	1	1	4	0	0
4	Long Canyon above NM 456 (DCR 06)	02LongCa004.1	Long Canyon (Perennial reaches abv Dry Cimarron)	2	1	0	0	0	1	1	4	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DO Deployment ²	Chlorophyll a ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
5	Oak Creek above Dry Cimarron River (DCR 03)	02OakCre000.1	Oak Creek (Dry Cimarron to headwaters)	3	0	0	0	0	0	0	4	0	0
6.1	Dry Cimarron River below Folsom Falls - 02DryCim114.9	02DryCim114.9	Dry Cimarron River (Oak Creek to headwaters)	2	1	0	0	0	1	1	2	0	0
7	North Shuree Pond	05NShureeDeep	Shuree Pond (North)	L	0	3	0	3	0	0	0	0	0
8	Shuree Creek above North Shuree Pond	05ShurCr000.8	Shuree Pond (North)	IO	0	0	0	0	0	0	3	0	0
9	Shuree Creek below North Shuree Pond	05ShurCr000.6	Shuree Pond (North)	IO	0	0	0	0	0	0	3	0	0
10.1	Middle Ponil Creek @ FR 1910/1914 - 05MPonil019.3	05MPonil019.3	Middle Ponil Creek (South Ponil to Greenwood Creek)	2	1	0	0	0	1	1	4	0	0
11	Middle Ponil Creek above South Ponil Creek	05MPonil000.1	Middle Ponil Creek (South Ponil to Greenwood Creek)	2	1	0	0	0	1	1	4	0	0
12	Greenwood Creek above Middle Ponil Creek	05Greenw000.1	Greenwood Canyon (Middle Ponil Creek to headwaters)	2	1	0	0	0	1	1	4	0	0
13	South Ponil above Middle Ponil Creek	05SPonil008.5	South Ponil Creek (Middle Ponil Creek to headwaters)	3	1	0	0	0	0	1	2	0	0
14	South Ponil above North Ponil Creek	05SPonil000.1	South Ponil Creek (Ponil Creek to Middle Ponil Creek)	2	1	0	0	0	1	1	4	0	0
14.1	South Ponil downstream of Pueblano Camp	05SPonil015.8	South Ponil Creek (Ponil Creek to Middle Ponil Creek)	3	0	0	0	0	0	1	0	0	0
15.1	North Ponil below FR 1950 - 05NPonil027.5	05NPonil027.5	North Ponil Creek (Seally Canyon to headwaters)	2	1	0	0	0	1	1	4	0	0
16	North Ponil Creek above South Ponil Creek	05NPonil000.1	North Ponil Creek (South Ponil Creek to Seally Canyon)	2	1	0	0	0	1	1	4	0	0
17	McCrystal Creek at USFS Campground	05McCrys002.0	McCrystal Creek (North Ponil to headwaters)	2	1	0	0	0	1	1	4	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DO Deployment ²	Chlorophyll a ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
18	Ponil Creek above NM 64	05PonilC014.9	Ponil Creek (US 64 to confl of North & South Ponil)	2	1	0	0	0	1	1	4	0	0
19	Ponil Creek above Cimarron River	05PonilC000.1	Ponil Creek (Cimarron River to US 64)	2	1	0	0	0	1	1	4	0	0
20	American Creek above Cieneguilla Creek	05Americ000.5	American Creek (Cieneguilla Creek to headwaters)	2	1	0	0	0	1	1	4	0	0
21	Saladon Creek above Cieneguilla Creek	05Salado000.5	Saladon Creek (Cieneguilla Creek to HW)	2	1	0	0	0	1	1	4	0	0
22	West Agua Fria Creek above Cieneguilla	05WestAg000.6	West Agua Fria Creek (Cieneguilla Creek to headwaters)	3	1	0	0	0	0	1	2	0	0
23	Cieneguilla Creek at Angel Fire Road	05Cieneg019.3	Cieneguilla Creek (Eagle Nest Lake to headwaters)	1	0	0	0	0	0	0	6	0	0
24	Angel Fire WWTP	NM0030503	Cieneguilla Creek (Eagle Nest Lake to headwaters)	1	0	0	0	0	0	0	6	0	0
25	Cieneguilla Creek above Eagle Nest Lake	05Cieneg006.3	Cieneguilla Creek (Eagle Nest Lake to headwaters)	1	1	0	0	0	1	1	6	1	1
26	Sixmile Creek above US 64	05Sixmil001.4	Sixmile Creek (Eagle Nest Lake to headwaters)	2	1	0	0	0	1	1	4	0	0
27	Moreno Creek on NM 64	05Moreno003.7	Moreno Creek (Eagle Nest Lake to headwaters)	2	1	0	0	0	1	1	4	0	0
28	Eagle Nest Lake	05EagleNestDP	Eagle Nest Lake	L	0	3	0	3	0	0	0	0	0
29.1	Cimarron River at Eagle Nest Outlet - 05Cimarr078.1	05Cimarr078.1	Cimarron River (Turkey Creek to Eagle Nest Lake)	IO	0	0	0	0	0	0	3	0	0
30	Tolby Creek above Cimarron River	05TolbyC000.1	Tolby Creek (Cimarron River to headwaters)	2	1	0	0	0	1	1	4	0	0
31	Clear Creek above Cimarron River	05ClearC000.1	Clear Creek (Cimarron River to headwaters)	2	1	0	0	0	1	1	4	0	0
32	Ute Creek above US 64	05UteCre000.6	Ute Creek (Perennial prt Cimarron River to headwaters)	2	1	0	0	0	1	1	4	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DO Deployment ²	Chlorophyll a ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
33	Cimarron River @ NM 21 in Cimarron	05Cimarr044.2	Cimarron River (Cimarron village to Turkey Creek)	2	1	0	0	0	1	1	4	0	0
34	Cimarron River above Turkey Creek	05Cimarr051.4	Cimarron River (Turkey Creek to Eagle Nest Dam)	2	1	0	0	0	1	1	4	0	0
34.1	Turkey Creek above Cimarron River	05Turkey000.1	Turkey Creek (Cimarron River to headwaters)	3	0	0	0	0	0	0	2	0	0
36	Rayado Creek at NM 21	05Rayado033.8	Rayado Creek (Miami Lake Diversion to headwaters)	2	1	0	0	0	1	1	4	0	0
36.1	Rayado Creek near Zastrow Camp	05Rayado041.0	Rayado Creek (Miami Lake Diversion to headwaters)	3	0	0	0	0	0	1	0	0	0
37	Rayado Creek at Miami Lake	05Rayado018.5	Rayado Creek (Cimarron River to Miami Lake Diversion)	2	1	0	0	0	1	1	4	0	0
38	Cimarron River above Springer WWTP	05Cimarr011.8	Cimarron River (Canadian River to Cimarron Village)	1	1	0	0	0	0	0	6	0	0
40.1	Cimarron River below Springer WWTP Ponds - 05Cimarr007.6	05Cimarr007.6	Cimarron River (Canadian River to Cimarron Village)	1	1	0	0	0	1	1	6	1	1
41	Springer Lake	05SpringerLDp	Springer Lake	L	0	3	0	3	0	0	0	0	0
42	Springer Lake inlet	05SpringerInlet	Springer Lake	IO	0	0	0	0	0	0	3	0	0
43	Springer Lake outlet	05SpringerOutlet	Springer Lake	IO	0	0	0	0	0	0	3	0	0
44	Chicorica Creek above Lake Maloya	04LMaloChicIn	(Lake Maloya to CO border)	IO	0	0	0	0	0	0	3	0	0
44.1	Lake Maloya Inlet at Schwachheim Creek	04LMaloSchwIn	Lake Maloya	IO	0	0	0	0	0	0	3	0	0
45	Lake Maloya	04LMaloyaDeep	Lake Maloya	L	0	3	0	3	0	0	0	0	0
46.1	Chicorica Creek below Maloya	04Chicor037.3	Chicorica Creek (East Fork Chicorica to headwaters)	IO	0	0	0	0	0	0	3	0	0
47	Chicorica Creek at NM 72	04Chicor029.4	Chicorica Creek (East Fork Chicorica to headwaters)	3	1	0	0	0	0	1	2	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DO Deployment ²	Chlorophyll a ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
48	East Fork Chicorica Creek above Chicorica Creek	04EFChic001.0	East Fork Chicorica Creek (Chicorica Creek to headwaters)	3	1	0	0	0	0	1	2	0	0
49	Chicorica Creek below Una de Gato Creek	04Chicor010.9	Chicorica Creek (Canadian River to East Fork Chicorica)	3	1	0	0	0	0	1	2	0	0
49.1	Hunter Creek above Una de Gato	05hunter000.1	Hunter Creek (Throttle Reservoir to headwaters)	3	0	0	0	0	0	0	1	0	0
50	Una de Gato Creek above NM 64	04UnaGat013.2	Una de Gato Creek (HWY 64 to headwaters)	2	1	0	0	0	1	1	4	0	0
51	Una de Gato Creek above Chicorica Creek	04UnaGat000.1	Una de Gato Creek (Chicorica Creek to HWY 64)	2	1	0	0	0	1	1	4	0	0
52	Doggett Creek above Raton WWTP	04Dogget002.3	Doggett Creek (Raton Creek to headwaters)	1	1	0	0	0	0	0	6	0	0
53	Raton WWTP	NM0020273	Raton Creek (Chicorica Creek to headwaters)	1	0	0	0	0	0	0	6	0	0
54	Doggett Creek below Raton WWTP	04Dogget002.2	Doggett Creek (Raton Creek to headwaters)	1	1	0	0	0	1	1	6	1	1
55	Raton Creek at McAuliffe Ranch	04RatonC005.1	Raton Creek (Chicorica Creek to hdwtrs)	2	1	0	0	0	1	1	4	0	0
56	Tinaja Creek above West Fork Tinaja Creek	04Tinaja010.1	Tinaja Creek (Canadian River to headwaters)	2	1	0	0	0	1	1	4	0	0
56.1	Tinaja Creek above Canadian River	04Tinaja001.9	Tinaja Creek (Canadian River to headwaters)	3	0	0	0	0	0	0	1	0	0
57	Maxwell Lake 13	04MaxLk13Deep	Maxwell Lake 13	L	0	3	0	3	0	0	0	0	0
58	Maxwell Lake 13 inlet	MaxLk13InLt	Unassessed Waters	IO	0	0	0	0	0	0	3	0	0
59	Maxwell Lake 13 outlet	04MaxLK13OutL	Unassessed Waters	IO	0	0	0	0	0	0	3	0	0
60	Canadian River at I-25	04Canadi416.5	Canadian River (Cimarron River to CO border)	2	1	0	0	0	1	1	4	0	0
61	Canadian River above Cimarron River	04Canadi352.7	Canadian River (Cimarron River to CO border)	2	1	0	1	0	1	1	4	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DO Deployment ²	Chlorophyll a ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
62	Canadian River at NM 120	06Canadi274.8	Canadian River (Mora River to Cimarron River)	2	1	3	1	0	1	1	4	0	0
63	Caliente Canyon above Vermejo River	04Calien000.1	Caliente Canyon (Vermejo River to headwaters)	2	1	3	0	0	1	1	4	0	0
64.1	Leandro Creek ~5km abv Vermejo River	04Leandr005.7	Leandro Creek (Vermejo River to headwaters)	2	1	0	0	0	0	1	2	0	0
65	Van Bremmer Creek at NM 64	04VanBre009.4	Van Bremmer Creek (HWY 64 to headwaters)	3	0	0	0	0	0	0	1	0	0
66	York Canyon above Vermejo River	04YorkCa000.1	York Canyon (Vermejo River to headwaters)	2	1	0	0	0	1	1	4	0	0
67.1	Vermejo River at Juan Baca Canyon - 04Vermej080.2	04Vermej080.2	Vermejo River (York Canyon to headwaters)	2	1	0	0	0	1	1	4	0	0
67.2	Vermejo River abv Rock Creek - 04Vermej090.5	04Vermej090.5	Vermejo River (York Canyon to North Fork Vermejo River)	2	0	0	0	0	0	1	2	0	0
68	Vermejo River above Rail Canyon	04vermej039.5	Vermejo River (Rail Canyon to York Canyon)	2	1	0	0	0	1	1	4	0	0
68.1	Vermejo River below confluence with Leandro Creek - 04Vermej094.1	04Vermej094.1	Vermejo River (Rail Canyon to York Canyon)	3	0	0	0	0	0	1	2	0	0
69.1	Vermejo River at I-25	04Vermej002.9	Vermejo River (Canadian River to Rail Canyon)	2	1	0	0	0	1	1	4	0	0
70	Lower Charette Lake	06LoCharetteD	Charette Lake (Lower)	L	0	3	0	3	0	0	0	0	0
71	Lower Charette Lake Inlet	06LoCharInlet	Charette Lake (Lower)	IO	0	0	0	0	0	0	3	0	0
72	Lower Charette Lake Outlet	06LoChareOut	Charette Lake (Lower)	IO	0	0	0	0	0	0	3	0	0
73	Wheaten Creek above Ocate Creek	06Wheate000.8	Wheaten Creek (Manueles Creek to headwaters)	3	1	0	0	0	0	1	2	0	0
73.1	Wheaten Creek below Bonita Creek	06Wheate007.3	Wheaten Creek (Manueles Creek to headwaters)	3	0	0	0	0	0	1	0	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DO Deployment ²	Chlorophyll a ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
74	Manueles Creek above Ocate Creek	06Manuel008.7	Manueles Creek (Ocate Creek to headwaters)	3	1	0	0	0	0	1	2	0	0
75	Ocate Creek above Ocate Village	06OcateC063.0	Ocate Creek (Ocate to Wheaten Creek)	3	0	0	0	0	0	0	2	0	0
76	Ocate creek at I-25	06OcateC025.1	Ocate Creek (Canadian River to Ocate)	2	1	0	0	0	1	1	4	0	0
77	Lujan Canyon above Mora River	07LujanC000.1	Lujan Canyon (Luna Creek to headwaters)	3	1	0	0	0	0	1	2	0	0
78	Luna Creek above Mora River	07LunaCr000.1	Luna Creek (Mora River to headwaters)	3	1	0	0	0	0	1	2	0	0
79	Mora River at Cleveland Village	07MoraRi154.8	Mora River (HWY 434 to Luna Creek)	1	1	0	0	0	1	1	6	1	1
80	Wolf Creek above Mora River	07WolfCr000.6	Wolf Creek (Mora River to headwaters)	3	0	0	0	0	0	0	1	0	0
81	Coyote Creek above Black Lake	07Coyote057.0	Coyote Creek (Black Lake to headwaters)	3	1	0	0	0	1	1	2	0	0
82	Little Coyote Creek at NM 434	07LitCoy001.3	Little Coyote Creek (Black Lake to headwaters)	2	1	0	0	0	1	1	4	0	0
83	La Jara Creek above Coyote Creek	07LaJara016.6	La Jara Creek (Coyote Creek to headwaters)	2	1	0	0	0	0	1	2	0	0
84	Coyote Creek at USGS Gage at Thal Ranch	07Coyote004.2	Coyote Creek (Mora River to Black Lake)	2	1	0	0	0	1	1	4	0	0
85	Coyote Creek at Coyote State Park	07Coyote040.0	Coyote Creek (Mora River to Black Lake)	2	1	0	0	0	1	1	4	0	0
86	Santiago Creek at NM 94	07Santia002.3	Santiago Creek (Rito Cebolla to headwaters)	3	0	0	0	0	0	0	1	0	0
87	Morphy Lake	07MorphyLake2	Morphy (Murphy) Lake	L	0	3	0	3	0	0	3	0	0
88	Morphy Lake Inlet	07MorphyInlet	Morphy (Murphy) Lake	IO	0	0	0	0	0	0	3	0	0
89	Morphy Lake Outlet	07MorphOutlet	Morphy (Murphy) Lake	IO	0	0	0	0	0	0	3	0	0
90	Rito Morphy above Cebolla Creek	07RMorph001.6	Rito Morphy (Rito Cebolla to headwaters)	2	1	0	0	0	1	1	4	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DO Deployment ²	Chlorophyll a ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
90.1	Rito Morphy at Upper Murphy Valley Rd	07RMorph008.8	Rito Morphy (Rito Cebolla to headwaters)	3	0	0	0	0	0	1	0	0	0
91	Rito Cebolla at NM 161	07RitoCe000.3	Rito Cebolla (Mora River to headwaters)	3	0	0	0	0	1	0	1	0	0
91.1	Rito Cebolla above hwy 518 - 07RitoCe004.6	07RitoCe004.6	Rito Cebolla (Mora River to headwaters)	3	1	0	0	0	0	1	2	0	0
92	Maestas Creek above Manuelitas Creek	07Maesta000.4	Maestas Creek (Manuelitas Creek to headwaters)	3	1	0	0	0	0	1	2	0	0
93	Rito Gascon above Rito San Jose	07RGasco002.0	Rito de Gascon (Rito San Jose to headwaters)	2	1	0	0	0	1	1	4	0	0
94	Rito San Jose above Manuelitas Creek	07RSanJo000.5	Rito San Jose (Manuelitas Creek to headwaters)	2	1	0	0	0	1	1	4	0	0
94.1	Rito San Jose above Rito de Gascon	07SanJo009.2	Rito San Jose (Manuelitas Creek to headwaters)	3	0	0	0	0	0	0	1	0	0
95.1	Manuelitas Creek abv Sapello River	07Manuel000.2	Manuelitas Creek (Sapello River to headwaters)	3	1	0	0	0	0	1	2	0	0
95.2	Sparks Ck. abv Maestas Cr. - 07Sparks000.3	07Sparks000.3	Sparks Creek (Maestas Creek to headwaters)	3	1	0	0	0	0	1	2	0	0
95.3	Manuelitas Creek blw Rociada - 07Manuel021.7	07Manuel021.7	Manuelitas Creek (Rito San Jose to Maestas Creek)	3	1	0	0	0	0	1	2	0	0
96	Sapello River at San Ignacio	07Sapell052.4	Sapello River (Manuelitas Creek to headwaters)	2	1	0	0	0	1	1	4	0	0
97	Sapello River at NM 161	07Sapell000.1	Sapello River (Mora River to Manuelitas Creek)	2	1	0	0	0	1	1	4	0	0
98.1	Rio de la Casa above Mora River	07RioLaC002.8	Rio la Casa (Mora River to confl of North and South Forks)	3	1	0	0	0	0	1	2	0	0
99	Mora River at la Cueva	07MoraRi139.9	Mora River (USGS gage east of Shoemaker to HWY 434)	1	1	0	0	0	1	1	6	1	1

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DODeployment ²	Chlorophyll a ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
100	Mora WWTP	NM0024996	Mora River (USGS gage east of Shoemaker to HWY 434)	1	0	0	0	0	0	0	6	0	0
101	Mora River at Black Willow Ranch	07MoraRi086.0	Mora River (USGS gage east of Shoemaker to HWY 434)	BH	0	0	0	0	1	1	1	1	1
102	Mora River at Watrous	07MoraRi094.0	Mora River (USGS gage east of Shoemaker to HWY 434)	1	1	0	0	0	0	0	6	0	0
103	Mora River above Canadian River	07MoraRi000.8	Mora River (Canadian River to USGS gage east of Shoemaker)	2	1	0	0	0	1	1	4	0	0
104	Canadian River at Mills Canyon	06Canadi305.0	Canadian River (Mora River to Cimarron River)	2	1	3	0	0	1	1	4	0	0
105	Conchas River at NM 104	08Concha025.1	Conchas River (Conchas Lake to headwaters)	3	1	0	0	0	0	1	2	0	0
106	Trementina Creek below Arroyo Rendia	08Tremen026.2	Unassessed waters with no AU	3	1	0	0	0	0	1	2	0	0
107	Conchas Reservoir near Dam	08ConResNrDam	Conchas Reservoir	L	0	3	0	3	0	0	0	0	0
108	Conchas Reservoir near Rattlesnake	08ConResNrRat	Conchas Reservoir	L	0	3	0	3	0	0	0	0	0
109	Conchas Reservoir at Canadian River Arm	08ConResCaArm	Conchas Reservoir	L	0	3	0	3	0	0	0	0	0
110	Canadian River at NM 419	06Canadi232.6	Canadian River (Conchas River to Mora River)	IO	0	0	0	0	0	0	3	0	0
111	Canadian River below Conchas Dam	09Canadi204.1	Canadian River (Ute Reservoir to Conchas Reservoir)	IO	0	0	0	0	0	0	3	0	0
111.1	Conchas outlet at irrigation canal	08ConResOutlr		IO	0	0	0	0	0	0	3	0	0
112.1	Canadian River at NM 104 at milemarker 88 - 09Canadi144.5	09Canadi144.5	Canadian River (Ute Reservoir to Conchas Reservoir)	2	1	3	1	0	1	1	4	0	0
113.1	Pajarito Creek Below Noname Creek	09Pajari013.8	Pajarito Creek (Canadian River to headwaters)	1	1	0	0	0	1	1	6	1	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DO Deployment ²	Chlorophyll a ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
114	Pajarito Creek at NM 104	09Pajari020.0	Pajarito Creek (Canadian River to headwaters)	1	1	0	0	0	0	0	6	0	0
115	Revelto Creek above Canadian River	11Revuel003.9	Revelto Creek (Canadian River to headwaters)	2	1	0	0	0	1	1	4	0	0
116	Tucumcari WWTP	NM0020711		2	0	0	0	0	0	0	0	0	0
117	No Name Creek above Pajarito Creek	09NoName002.1	No Name Creek (Pajarito Creek to headwaters)	3	0	0	0	0	0	0	2	0	0
117.1	Breen's pond near outlet	09BreensPondNr Outlet		2	0	0	0	0	0	0	0	0	0
118	Ute Creek near Logan Village	10UteCre007.5	Ute Creek (Ute Reservoir to headwaters)	IO	0	0	0	0	0	0	3	0	0
119	Ute Reservoir near Dam	09UteResNrDam	Ute Reservoir	L	0	3	0	3	0	0	0	0	0
120	Ute Reservoir near Horseshoe	09UteResAtHor	Ute Reservoir	L	0	3	0	3	0	0	0	0	0
120.1	Ute Reservoir Canadian Arm - 09UteResAtCan	09UteResAtCan	Ute Reservoir	L	0	3	0	3	0	0	0	0	0
121	Ute Reservoir at Ute Creek Arm	09UteResAtUte	Ute Reservoir	L	0	0	0	0	0	0	0	0	0
122	Ute Creek at NM 102	10UteCre104.3	Ute Creek (perennial prt Bueyeros Ck to Palo Blanco Creek)	3	1	0	0	0	0	1	2	0	0
123	Ute Creek at Hwy 120	10UteCre150.7	Ute Creek (Perennial prt Bueyeros Ck to Palo Blanco Creek)	2	1	1	0	0	1	1	4	0	0
124	CANADIAN R 1.0 MI BL UTE DAM,NM at hwy 54 near USGS gage	09Canadi062.4	Canadian River (TX border to Ute Reservoir)	2	1	3	0	0	1	1	4	0	0
124.1	Canadian River below Ute Dam	09Canadi065.4	Canadian River (TX border to Ute Reservoir)	IO	0	0	0	0	0	0	3	0	0
125	Canadian River above TX State Line	09Canadi001.2	Canadian River (TX border to Ute Reservoir)	2	1	3	1	0	1	1	4	0	0
126	Seneca Creek above Clayton Lake	16Seneca043.0	Seneca Creek (Perennial reaches abv Clayton Lake)	IO	0	0	0	0	0	0	3	0	0

Map #	Station Name	Station ID	Assessment Unit	Priority ¹	Sonde/DO Deployment ²	Chlorophyll a ³	Periphyton-diatoms ⁴	Phytoplankton	Physical Habitat ⁵	Thermograph ⁶	Flow	Macro-invertebrates	Fish ⁷
127	Clayton Lake	16ClaytonDeep	Clayton Lake	L	0	3	0	3	0	0	0	0	0
128.1	Seneca Creek Blw Clayton Lake - 16Seneca040.2	16Seneca040.2	Clayton Lake	IO	0	0	0	0	0	0	3	0	0
Quality Control samples collected per QAPP					0	0	0	0	0	0	0	0	0
Totals					82	61	4	42	60	85	420	7	6

¹Priority rankings: 1 are the highest priorities, and 3 the lowest. "L" are lake stations, "IO" are lake inlets or outlets.

²Sondes are deployed at sites that indicate elevated turbidity or nutrient enrichment or have been previously listed for turbidity or nutrients.

³Chlorophyll-a samples are collected at sites that indicate nutrient enrichment or have been previously listed for nutrients. Additional stations may be added as indicated by the preliminary nutrient assessments.

⁴Periphyton community composition samples are only collected at "non-wadeable" river sites that indicate nutrient enrichment or have been previously listed for nutrients. The exact number of periphyton samples to be collected will be unknown until after 3 to 5 sampling runs.

⁵If sedimentation data (pebble counts) exceed the threshold value for percent sand and fines at a site, more extensive habitat data are collected.

⁶If preliminary analysis of thermograph data indicates potential for impairment then cross-section, flow, canopy cover, and slope data required to use SSTEMP temperature modeling software will be collected.

⁷Fish sampling will be determined by interagency cooperation and the availability of river shocking equipment.

5.0 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 biological samples sent to contract laboratories; and equipment costs for *E. coli* analysis performed by qualified SWQB staff. These 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 two staff per monthly survey to stay up to two nights out of Santa Fe. Biological survey crew maximum requirements are four staff surveying one to two sites per day. Therefore, twelve biological survey sites may take up to ten days, or over two weeks (Table 10). Staff receives \$91 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.

Table 8. Biological and Chemical Cost Summary

Analyte	Total # Samples	Cost per Sample (WTU or \$)	Total Expenditure (WTU or \$)
TDS/TSS	497	24	11,928
TDS/TSS/Cl/SO4	31	48	1,488
Nutrients	34	76	2,584
Nutrients, low phosphorus	490	100	49,000
Total Metals	224	90	20,160
Dissolved Metals	249	195	48,555
<i>E. coli</i> (in-house)	523	\$5.08	\$2,656.84
Volatile Organic Compunds	42	150	6,300
Semi-volatile Organics	42	180	7,560
Radionuclides	40	120	4,800
Chlorophyll <i>a</i>	61	\$50	\$3,050
Diatoms	4	\$425	\$1,700
Phytoplankton	42	\$165	\$6,930
Macroinvertebrates	7	\$175	\$1,225
TOTALS		WTU	152,375
		DOLLAR \$	\$15,562

Table 9. Vehicle Costs

Month	Approximate Miles	Estimated MPG	Estimated Cost of Gasoline per Gallon	Total Fuel Costs
March	2500	17	\$3.50	\$514.71
April	2500	17	\$3.50	\$514.71
May	2500	17	\$3.50	\$514.71
June	2500	17	\$3.50	\$514.71
July	2500	17	\$3.50	\$514.71
August	2500	17	\$3.50	\$514.71
September	2500	17	\$3.50	\$514.71
October	2500	17	\$3.50	\$514.71
TOTAL				\$4,117.65

Table 10. Stream/Lake Survey Per Diem Costs

Expense	Water Chemistry Surveys	Biological and Habitat Surveys	Total
Per Diem (number of nights out)	\$5,824	\$2,912	\$8,736
Salary Days	96	48	144

*Staff days are estimated for two crews of two going out for chemistry surveys for three days and two crews of two going out for three day bio/habitat surveys.

Table 11. Total Cost Estimates

WTUs	Contract Labs & Supplies \$	Fuel \$	Per Diem \$	Staff Field Days
151,775	\$15,531	\$4,118	\$8,736	144

Questions or comments on this Field Sampling Plan should be directed to the SWQB project coordinators.

Surface Water Quality Bureau

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

6.0 REFERENCES

New Mexico Administrative Code (NMAC). 2013. *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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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
Anthracene	Chlorobenzene
Atrazine	Chloroethane

Organics (semi-volatiles)	Organics (volatiles)
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	
Methoxychlor	
Metolachlor	
Metribuzin	

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