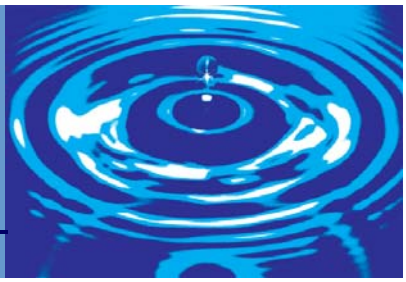
State of New Mexico

Water Quality Control Commission



FINAL DRAFT

2016 - 2018

State of New Mexico Clean Water Act Section 303(d)/Section 305(b) Integrated Report

~~April 25~~May 30, 2016

Prepared by:
New Mexico Environment Department
Surface Water Quality Bureau
1190 St. Francis Dr.
Santa Fe, NM 87505
www.nmenv.state.nm.us/swqb

New Mexico Water Quality Control Commission (as of April 2016)

Ryan Flynn, Chair
Environment Department

Deborah Dixon, Designee
Office of the State Engineer

Vacant, Designee
Bureau of Geology & Mineral Resources

Vacant, Designee
Department of Health

Scott Dawson, Designee
Energy, Minerals and Natural Resources Department
Oil Conservation Commission

Tony Delfin, Designee
Energy, Minerals and Natural Resources Department
State Forestry Division

Larry J. Dominguez, Designee
Department of Agriculture

Matthias Sayer, Designee
Department of Game and Fish

Howard Hutchinson, Designee
Soil and Water Conservation Commission ~~Captain~~Chairman

Jane DeRose-Bamman, Designee
ABQ-Bern. Co. Water Utility Authority
NM Municipal Environmental Quality Association, Albuquerque

Edward Vigil, Member-at-Large
Tularosa

Hoyt Pattison, Member-at-Large
Clovis

John Waters, Member-at-Large
Carlsbad

Vacant, Member-at-Large
Tribal-Pueblo

Table of Contents

Lists of Figures, Tables, Appendices and Acronyms iv

EXECUTIVE SUMMARY 1

PART A - INTRODUCTION 6

PART B - BACKGROUND 8

- B.1 Scope of Waters Included in Integrated Report 9
- B.2 Water Pollution Control in New Mexico's Surface Waters 12
- B.3 Resource Assessment of New Mexico's Water Quality Management Programs 37
- B.4 Significant Surface Water Issues 40

PART C - SURFACE WATER MONITORING AND ASSESSMENT 43

- C.1 Statewide Water Quality Monitoring 43
- C.2 Assessment Methodology 50
- C.3 Water Quality Assessment Results 52
- C.4 CWA Section 303(d) List – Impaired Waters in New Mexico 63

PART D - GROUND WATER MONITORING AND ASSESSMENT 67

- D.1 Ground Water in New Mexico 67
- D.2 Ground Water Monitoring and Protection Programs 68
- D.3 Ground Water Quality Status 69
- D.4 Ground Water Contamination Sources 70
- D.5 Significant Ground Water Issues 71

PART E – PUBLIC PARTICIPATION 74

References 75

List of Figures

Figure 1. Relationship between CWA 303(d), Impairments, and IR Categories
Figure 2. New Mexico Surface Water Basins
Figure 3. New Mexico's Water Quality Management Framework Adopted by the WQCC in the WQMP/CPP
Figure 4. SWQB's General Framework for Identifying and Restoring New Mexico's Surface Waters
Figure 5. Distribution of NPDES Permits in New Mexico
Figure 6. CWA Section 319(h) Funded Projects Started in Year 2009 - 2013
Figure 7. CWA Section 319(h) Funding Distribution by NPS Pollution Category
Figure 8. CWA Section 319(h) Funding Allocation (Based on Calendar Year 2013)
Figure 9. River Stewardship Program Priority Areas
Figure 10. Current Wetland Projects in New Mexico
Figure 11. New Mexico's Surface Water Quality Monitoring Schedule
Figure 12. Top 10 Causes of Surface Water Impairment for Rivers and Streams
Figure 13. Top 10 Probable Sources of Surface Water Impairment for Rivers and Streams
Figure 14. Top 10 Causes of Surface Water Impairment for Lakes and Reservoirs

List of Tables

Table 1. New Mexico's Integrated Report Categories
Table 2. Summary of New Mexico's Surface Water Resources
Table 3. Example BMPs Implemented Throughout New Mexico
Table 4. CWA Section 319(h) Projects Beginning in Calendar Year 2014
Table 5. Active Wetland Projects in New Mexico, by County
Table 6. Estimated State FY2015 Expenditures on New Mexico's Surface Water Quality Management Programs Implemented Through NMED SWQB
Table 7. Estimated Annual Operation and Maintenance Costs for Wastewater Treatment Facilities in New Mexico
Table 8. Summary of Improvement and Construction Costs for New Mexico Water, Wastewater, and Solid Waste Facilities
Table 9. Integrating Report Categories for New Mexico's Rivers and Streams
Table 10. Designated Use Support for New Mexico's Rivers and Streams
Table 11. Summary of Impairment Reporting Categories for New Mexico's Lakes and Reservoirs
Table 12. Individual Designated Use Support Summary for New Mexico Lakes and Reservoirs
Table 13. Percentage of Waters Impaired for at Least One Water Quality Parameter
Table 14. Percentage of Waters Impaired for at Least One Common Water Quality Parameter

List of Appendices

Appendix A. 2016-2018 State of New Mexico Clean Water Act Section 303(d)/Section 305(b) Integrated List
Appendix B. New Mexico Water Quality Impairment Causes and Sources
Appendix C. Response to Public Comments on Integrated List

List of Acronyms

ACWA	Association of Clean Water Administrators
ADB	Assessment Database
ATTAINS	Assessment &Total Maximum Daily Load Tracking & Implementation System
AU	Assessment Unit
BLM	Bureau of Land Management
BOR	Best Management Practices
BMPs	U.S. Bureau of Reclamation
CERTMAN	Certification Management System
CFR	Code of Federal Regulations
CPB	Construction Programs Bureau
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
DDT	dichlorodiphenyltrichloroethane
DO	Dissolved Oxygen
DOE	Department of Energy
DWB	Drinking Water Bureau
DWSRLF	Drinking Water State Revolving Loan Fund
E. coli	*Escherichia coli*
ECHO	Enforcement Compliance History Online Database
EPA	Environmental Protection Agency
EMAP	Environmental Monitoring and Assessment Program
FY	Fiscal Year
GIS	Geographic Information System
GRTS	Grant Reporting and Tracking System
GWUDI	Ground Water Under the Direct Influence
GWQB	Ground Water Quality Bureau
HP	Hydrology Protocol
HUC	Hydrologic Unit Code
IBI	Indices of Biotic Integrity
ISC	Interstate Stream Commission
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LRG	Lower Rio Grande
MASS	Monitoring, Assessment and Standards Section
MCL	Maximum Contaminant Level
NARS	National Aquatic Resources Surveys
NMAC	New Mexico Administrative Code
NMDGF	New Mexico Department of Game and Fish
NMDOH	New Mexico Department of Health
NMED	New Mexico Environment Department
NMEDAS	New Mexico Ecological Data Application System
NMRAM	New Mexico Rapid Assessment Method
NMSA	New Mexico Statutes Annotated
N-STEPS	Nutrient Scientific Technical Exchange Partnership and Support
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
ONRW	Outstanding National Resource Water
OSE	New Mexico Office of the State Engineer
PCBs	Polychlorinated Biphenyls

PSRS	Point Source Regulation Section
QA/QC	Quality Assurance/ Quality Control
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
RBP	Rapid Bioassessment Protocol
RCRA	Resource Conservation and Recovery Act
RFP	Request for Proposal
RLWTF	Radioactive Liquid Waste Treatment Facility
ROD	Record of Decision
RSP	River Stewardship Program
SDWA	Safe Drinking Water Act
SLD	State Laboratory Division
SQUID	Surface water QUality Information Database
STORET	Storage and Retrieval System
SWCD	Soil and Water Conservation District
SWPP	Source Water Protection Plan
SWQB	Surface Water Quality Bureau
SWWS	Sanitary Waste Water System
TMDL	Total Maximum Daily Load
TSI	Trophic State Index
UOC	Utility Operator Certification
USACE	United States Army Corp of Engineers
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WBP	Watershed-Based Plan
WPP	Wetlands Program Plan
WPS	Watershed Protection Section
WQA	Water Quality Act (New Mexico)
WQCC	New Mexico Water Quality Control Commission
WQMP/CPP	Water Quality Management Plan / Continuing Planning Process
WQS	Water Quality Standards
WQX	Water Quality Exchange
WRAS	Watershed Restoration Action Strategies
WRDA	Water Resources Development Act

EXECUTIVE SUMMARY

New Mexico's Water Quality Management Programs

Under the New Mexico Water Quality Act (WQA), the New Mexico Water Quality Control Commission (WQCC) is the water pollution control agency for the state of New Mexico (the State). The WQCC is responsible for developing water quality standards (WQS) and adopting regulations in New Mexico consistent with the broader intent expressed by the legislature in passing the WQA. In implementing the WQA, the WQCC adopts water quality standards intended to protect waters of the State, as well as regulations aimed at achieving those standards. In addition to its formal rulemaking role, the WQCC serves as a forum to facilitate and advance a statewide dialogue on a variety of important water quality issues through the review and approval of this Report. The responsibilities for the administration of water quality management are assigned to constituent agencies.

The New Mexico Environment Department (NMED) is the constituent agency with primary responsibility for implementing and enforcing the regulations and standards adopted by the WQCC. Moreover, the NMED provides the principal source of technical expertise available to the WQCC in its rulemaking and adoption of a comprehensive water quality management program and continuing planning processes. Through the *State of New Mexico Statewide Water Quality Management Plan and Continuing Planning Process* (WQMP/CPP), the WQCC has designated the NMED as the constituent agency to assist in:

- Maintaining, restoring, and improving the quality of the State's waters;
- Evaluating discharges for compliance with regulations and standards;
- Developing water quality classifications and standards;
- Performing site application and design and specification reviews of new or expanding wastewater treatment facilities;
- Undertaking monitoring and enforcement of the statutes and permits pertinent to water quality;
- Coordinating water quality management planning;
- Managing state and federal construction grant and loan assistance programs which provide financial support to municipalities for construction or improvement of wastewater treatment facilities;
- Managing the ground water quality protection program with the goal of protecting the public health and beneficial use of ground water; and
- Providing technical assistance to local governments regarding water and wastewater treatment.

Surface Water Quality Protection in New Mexico

The protection of water quality in New Mexico is vitally important to the health and well-being of all New Mexicans and the aquatic life and wildlife that inhabit its waters. New Mexico uses a variety of mechanisms, including state, federal, and local programs, to protect and restore the quality of its surface and ground waters. The basic underpinnings of surface water protection as provided in the United States Clean Water Act (CWA) and the New Mexico WQA are found in

the *State of New Mexico Standards for Interstate and Intrastate Surface Waters* [20.6.4 NMAC]. The purpose of the regulations is to establish water quality standards that consist of the designated use or uses of surface waters of the State, the water quality criteria necessary to protect the use or uses, and an antidegradation policy. Designated uses include fish culture, public water supply, industrial water supply, domestic water supply, irrigation, primary and secondary contact (including cultural, religious or ceremonial purposes), livestock watering, wildlife habitat, and aquatic life. To protect these uses and fulfill the requirements set forth in the law, coordinated programs have been developed to monitor, assess, protect, and restore surface water quality throughout New Mexico. The implementation of these programs is detailed in the WQMP/CPP, which serves as an important planning tool for the prevention and correction of water quality issues.

Like most states, New Mexico has utilized a targeted, rotational watershed approach to monitor and assess ambient surface water quality while still achieving comprehensive coverage of waters of the State. This approach was adopted in 1998 and has proven effective at achieving New Mexico's monitoring objectives given the level of financial and staff resources, and has provided:

- A systematic and detailed collection and review of water quality data that allows for more efficient use of human and budget resources;
- Information at a spatial scale where implementation of corrective actions is feasible;
- An established order of rotation and predicted sampling year for each watershed, which allows for easier coordination efforts with other programs and entities interested in water quality; and
- Enhanced program efficiency.

The process of addressing impairments begins with the identification of an impaired waterbody on the CWA Section 303(d) *List of Impaired Waterbodies*. Once a waterbody is listed, the impaired waterbody is evaluated to determine if changes to the standard may be appropriate, whether more data collection is necessary to confirm the impairment, or whether a total maximum daily load (TMDL) should be developed. If a TMDL is developed and assigned to the waterbody, it will provide a pollutant budget for both permitted discharges (point sources) and non-point sources, and it is incorporated into the WQMP/CPP.

The principal mechanism used to protect waters from the adverse effects of municipal and industrial point source discharges is the federal National Pollutant Discharge Elimination System (NPDES) program. The U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, issues and enforces these permits for discharges in New Mexico. As one of only four states in the nation without EPA authorization to implement the permitting program, New Mexico's role is limited to certification of the permits pursuant to the CWA Section 401. Nevertheless, State certification ensures that permit limits for discharges into surface waters implement federal CWA and New Mexico WQA requirements, protect state water quality standards, and implement the WQMP/CPP. Once the NPDES permit is issued, New Mexico assists the EPA with permit compliance tracking and on-site inspections.

The NMED implements the New Mexico Utility Operators Certification Act for the WQCC. The WQA and its regulations require that all public drinking water and wastewater treatment facilities are operated by qualified operators. Wastewater treatment facilities discharging to impaired surface waters are required to meet water quality based effluent limitations, which may increase

the complexity of the treatment facility. Having qualified operators at wastewater treatment facilities is a key factor in determining the quality of effluent discharge to a waterbody.

The State's Nonpoint Source Management Program works to prevent and correct water quality impairments from nonpoint sources of surface water pollution. The NMED is the lead agency for this program, which uses a variety of state, local, and federal agency programs to achieve implementation of Best Management Practices (BMPs) to prevent and abate nonpoint source pollution. The program annually prioritizes its efforts by ensuring that waterbodies listed as impaired receive greater consideration for funding under the CWA Section 319. The Nonpoint Source Management (NPS) Program also ensures that water quality standards are protected and the water quality management plan is implemented through the State certification of CWA Section 404 dredge-or-fill permits issued by the United States Army Corps of Engineers (USACE).

The NMED's Wetlands Program administers and directs wetland projects that serve to restore, protect, and reserve water quality pertinent to wetlands. All water quality programs have an associated outreach component to provide education and outreach for schools and interest groups wherever possible to help maintain, protect, and restore New Mexico's water quality.

Surface Water Quality in New Mexico

Knowledge about current surface water quality in New Mexico is based primarily on chemical, physical, biological and habitat data collected by NMED's Surface Water Quality Bureau (SWQB) during the following activities:

- Rotational watershed surveys;
- Water quality monitoring of projects under the State's NPS Pollution Management Program;
- TMDL surveys and studies;
- Special studies conducted to address specific localized water quality concerns;
- Analysis of fish tissues for development of Fish Consumption Advisories; and
- Water quality compliance monitoring conducted under the NPDES program.

These data are supplemented by long-term water quality monitoring collected by federal agencies such as the U.S. Geological Survey (USGS) and USACE at stream gages. Additionally, other entities are invited to contribute quality environmental data to be used for assessment purposes during a public data solicitation effort that is part of the development of this Integrated Report (IR).

SWQB's ambient surface water quality monitoring and assessment methods focus primarily on public, perennial waters; however, water quality problems may and have been identified on some intermittent and ephemeral waters. From the approximately 7,734 stream miles reported in New Mexico's Integrated 303(d)/305(b) List (Appendix A), nearly 4,070 miles (53%) have identified impairment(s) where water quality does not support the designated uses. Approximately 58,408 out of 89,073 (66%), publically-owned lake, reservoir, or playa acres reported in New Mexico's Integrated 303(d)/305(b) List do not fully support designated uses either. The State has issued fish consumption advisories for a variety of fish species in 26 lakes and reservoirs and three (3) rivers due to elevated concentrations of various contaminants, including mercury, dichlorodiphenyltrichloroethane (DDT), and polychlorinated biphenyls (PCBs).

Using all available data assessed against current designated, existing, or attainable uses utilizing established Assessment Protocols, the NMED has found that temperature, nutrient/eutrophication, and *E. coli* are the three most common causes of river and stream water quality impairments in New Mexico. The three most common causes of water quality impairments in lakes and reservoirs are mercury in fish tissue, PCBs in fish tissue, and temperature.

The vast majority of surface water quality impairments identified in New Mexico are due to nonpoint sources of water pollution. "Sources" are defined as activities that may contribute pollutants or stressors to a water body (EPA 1997). They are labeled as "Probable Sources" on the Integrated List (Appendix A) because they are not proven to be a source or the only sources of the identified impairment. The Probable Source noted for any impairment without a completed TMDL is "Source Unknown." When TMDLs are developed, information from Probable Source Sheets, available GIS layers and land use imagery, and both stakeholder and staff watershed knowledge are combined to develop draft Probable Source lists. They are finalized in TMDL documents and added to subsequent Integrated Lists. Rangeland grazing, drought-related impacts, and onsite treatment systems ~~, and loss of riparian habitat~~ are the leading sources of impairment in New Mexico's rivers and streams where TMDLs have been prepared. ~~The three most common causes of water quality impairments in lakes and reservoirs are mercury in fish tissue, PCBs in fish tissue, and temperature.~~

Ground Water Quality Protection in New Mexico

New Mexico's ground water resources are of vital importance and must be preserved for present and future generations. Approximately 50% of New Mexicans depend solely on ground water for drinking water. As with surface water, New Mexico relies on several programs established under a variety of statutory authorities to protect and maintain ground water quality. The New Mexico Water Quality Act authorizes the WQCC to adopt ground water quality protection regulations and standards. The New Mexico Oil and Gas Act, Hazardous Waste Act, Ground Water Protection Act, Solid Waste Act, Emergency Management Act, Voluntary Remediation Act, Mining Act, and Environmental Improvement Act also contain provisions which are designed to protect ground water quality, and which implement the ground water regulations and water quality standards directly or by reference. In addition, the State cooperates with local and federal governments on various programs relevant to ground water pollution control.

The predominant nonpoint sources of ground water contamination in New Mexico are household septic tanks or cesspools. Nonpoint source contamination may be caused by large numbers of small septic tanks spread over a subdivision, residual minerals from evapotranspiration, animal feedlot operations, areas disturbed by mineral exploration or storage of waste products, urban runoff, or application of agricultural chemicals. Point source contributions to ground water contamination include publicly- and privately-owned sewage treatment plants, dairy lagoons, mines, food processing operations, industrial discharges, landfills, and spills or leaks.

Integrated Report Highlights

Recognizing the overabundance of funding needs and limited resources in New Mexico, NMED developed the Water Infrastructure Team (WIT) in 2014. The WIT is a collaborative effort of government agencies and non-governmental organizations who are working together to tackle New Mexico's vast water infrastructure needs (including wastewater and drinking water). This

multi-state agency effort includes the identification of water system funding as well as technical, managerial, and financial assistance needs. Through a survey conducted in 2014, the WIT identified over $300 million of water-related infrastructure projects in need of funding and continues to work with stakeholders to help identify potential funding sources for these projects.

The Drinking Water Bureau submitted a primacy package to the EPA for the Revised Total Coliform Rule (RTCR), 78 FR 10269, February 13, 2013, Vol. 78, No. 30. The purpose of the RTCR is to increase public health protection through the reduction of potential pathways of entry for fecal contamination into public water system (PWS) distribution systems. The RTCR establishes a maximum contaminant level (MCL) for *E. coli* and uses *E. coli* and total coliforms to initiate a "find and fix" approach to address fecal contamination that could enter into the distribution system. It requires PWSs to perform assessments to identify sanitary defects and subsequently take action to correct them. The anticipated implementation date of the RTCR in New Mexico is April, 2016.

In January 2015, SWQB's CWA 303(d)/305(b) coordinator was invited to participate in EPA's Assessment &Total Maximum Daily Load Tracking & Implementation System (ATTAINS) Redesign "Lean" event in Washington, D.C. as one of five state representatives. "Lean" is a set of principles and methods used to identify and eliminate waste in any process. Lean helps organizations improve the speed and quality of their processes by collectively coming up with strategies to remove unnecessary activities such as document errors, extra process steps, and waiting time. The output of this Lean event is currently guiding the rest of the ATTAIN's Redesign. SWQB staff currently co-chair the ATTAINS Design Team, and NMED's Surface water QUality Information Database (SQUID) has been presented to the ATTAINS Team as a potential database interface for the redesign. The NMED Information Technology Bureau has been awarded an EPA Exchange Grant to modify SQUID as needed in order to pilot the ATTAINS Redesign during the 2016 Integrated Reporting cycle.

The SWQB initiated its current 2013 triennial review with an informal scoping phase for public feedback during April and May of 2013 to identify state priorities and potential changes to the WQS. Proposals for changes were developed into a discussion draft which was noticed for public review and comment during April and May of 2014. During comment periods for both the scoping phase and public discussion draft, the SWQB received input from the EPA, watershed/river conservation groups, municipalities, water districts, industrial/trade groups, private organizations and citizens. The SWQB also continued to meet and work with various groups whenever requested to address their concerns which resulted in additional changes. The SWQB presented the 2013 triennial review proposals for WQS changes to the WQCC in a public hearing held during October 13-16, 2015. Approval of proposals by the WQCC is pending and the earliest date for a decision is anticipated in spring 2016. Once approved by the WQCC, these changes will be submitted to EPA for final approval under CWA Section 303(c).

NMED's Nonpoint Source Management Program is designed as a cooperative effort among watershed stakeholders and NMED's SWQB Watershed Protection Section (WPS) to educate and implement best management practices (BMPs) to reduce nonpoint pollutants entering surface and ground waters. A plan for the Nonpoint Source Management Program was developed in 2014 and approved by EPA in early 2014 (NMED/SWQB 2014a), and a draft revised plan is currently under development. Both the current and draft revised plans state an overall goal of meeting and maintaining water quality standards and designated uses of surface water and ground water resources in New Mexico. The plan's objectives are directed toward meeting this goal, and are related to planning, restoring and protecting surface and ground water quality, education, and interagency cooperation.

PART A - INTRODUCTION

The *State of New Mexico Clean Water Act (CWA) Section 303(d)/ Section 305(b) Integrated Report* (Integrated Report or IR) is designed to satisfy the statutory requirements of Sections 303(d), 305(b), and 314 of the federal Water Pollution Control Act [33 U.S.C. 1251 *et seq*.], commonly known as the Clean Water Act (CWA). The Integrated Report also includes basic information on water quality and water pollution control programs in New Mexico to the United States Environmental Protection Agency (EPA) and the United States Congress, as well as to the general public.

In accordance with the statutory requirements of the CWA, the Integrated Report contains:

- An assessment of water quality;
- An analysis of the extent to which the CWA Section 101(a)(2) goal of surface water quality -- 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 programs for nonpoint source pollution control.

San Juan River near Lions Park

Designated uses are the desirable and attainable uses of a surface water segment as specified in 20.6.4.97 through 20.6.4.899 NMAC. These surface water segments are further broken down into one to many "assessment units" (e.g., stream reaches or waterbodies) for categorization and reporting purposes. In accordance with current EPA integrated listing guidance, New Mexico determines and assigns Fully Supporting, Not Supporting, and Not Assessed to each individual designated use to determine an IR category for every reported assessment unit on the Integrated List. A designated use assignment of "Not Assessed" means that a determination of Fully Supporting or Not Supporting could not be made based on available data and information. An assessment unit is considered "impaired" when one or more surface water quality standards are not being met for one or more pollutants. These pollutants are referred to as "impairments." New Mexico's IR categories are defined in Table 1. Waterbodies classified as Category 5 specifically constitute the *CWA Section 303(d) List of Impaired Waters,* however, New Mexico and EPA recognize waterbodies assigned IR Category 4 are also still impaired (Figure 1). In

this case, a TMDL is either already in place (IR Category 4A), not required because the impairment is not caused by a “pollutant” (IR Category 4C), or other pollution control requirements are in place and expected to result in attainment of the water quality standard within a reasonable amount of time (IR Category 4B). The Integrated Report format has not changed significantly from the 2006-2008 Integrated Report that was developed in accordance with EPA’s 2006 Integrated Report Guidance memorandum (EPA 2005). The EPA recommends and New Mexico has prepared the 2016 Integrated Report consistent with previous guidance memorandums, including EPA’s 2006 Integrated Report Guidance supplemented by EPA’s 2008, 2010, 2012, 2014, and the 2016 Integrated Report Guidance memorandums (EPA 2015). The common organizational structure and method of reporting water quality status from year to year facilitates the review that Congress and members of the public conduct on state reports and lists.

Table 1. New Mexico's Integrated Report (IR) Categories

Category	Description
1	All designated uses are supported.
2	Available data and/or information indicate that some, but not all, designated or existing uses are supported based on numeric and narrative parameters that were tested.
3A	There are insufficient available data and/or information to make a support determination (no data, or one data point available that does not exceed any applicable water quality criterion).
3B	There are insufficient available data and/or information to make a support determination (one data point available that does exceed an applicable water quality criterion).
4A	Available data and/or information indicate that at least one designated or existing use is not being supported, but a Total Maximum Daily Load (TMDL) is not needed because TMDLs have been already been established.
4B	Available data and/or information indicate that at least one designated or existing use is not being supported, but a TMDL is not needed because other pollution control requirements are reasonably expected to result in attainment of the water quality standard in the near future.
4C	Available data and/or information indicate that at least one designated or existing use is not being supported, but a TMDL is not needed because impairment is not caused by a pollutant.
5A	Available data and/or information indicate that at least one designated or existing use is not being supported and necessary TMDLs are underway or scheduled.
5B	Available data and/or information indicate that at least one designated or existing use is not being supported and a review of the water quality standard will be conducted to verify appropriateness.
5C	Available data and/or information indicate that at least one designated or existing use is not being supported but additional data are necessary to verify the listing before TMDLs are scheduled.

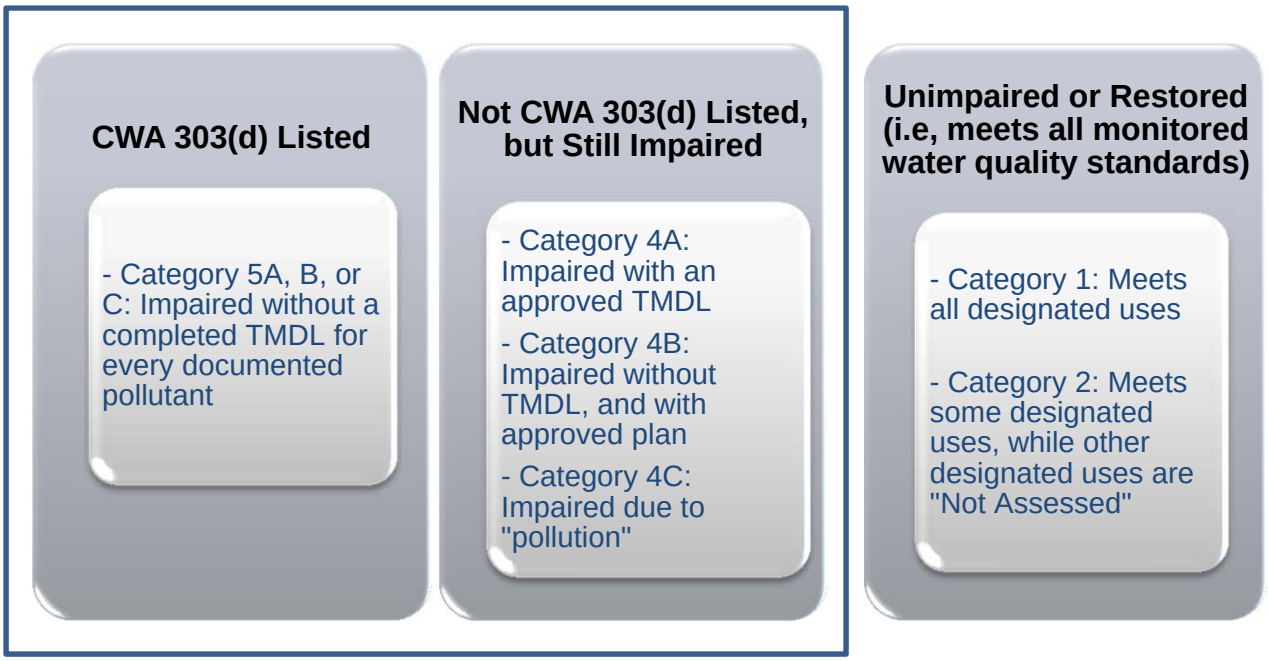


Figure 1. Relationship between CWA 303(d), Impairments, and IR Categories

PART B - BACKGROUND

B.1 Scope of Waters Included in Integrated Report

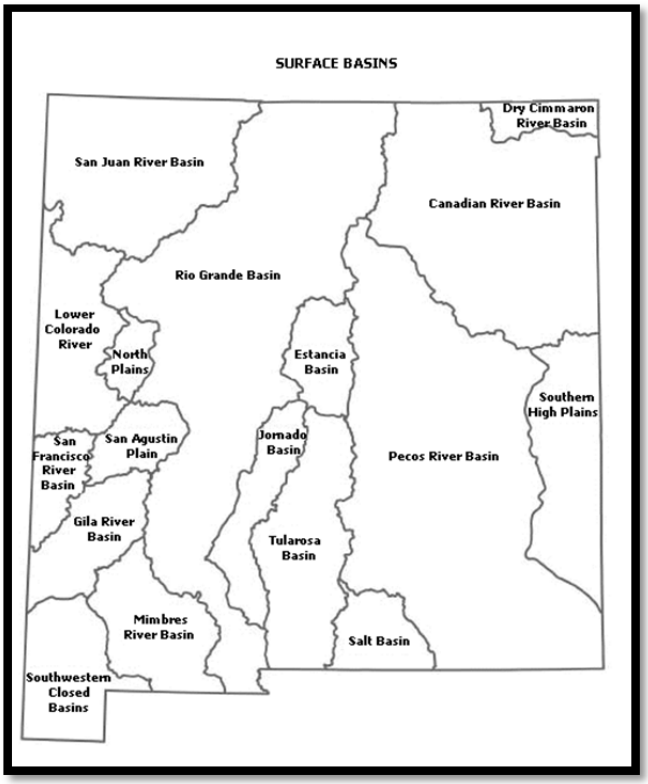


Figure 2. New Mexico Surface Water Basins

New Mexico is characterized by high mountains, expansive plains and plateaus, river gorges, and broad valleys. Land surface elevations in New Mexico vary from just under 3,000 feet above sea level at the Texas border in the southeastern portion of the State to just over 13,000 feet in the northern mountains. New Mexico is the fifth largest of the fifty states, with a total area of 121,607 square miles. Of this, 33.9% is federal land, 11.7% is State land, 10.4% is Native American land, and 44.0% is privately owned (BLM 2005). While the State's climate is generally arid to semiarid, New Mexico's mountainous areas impart a cooler and wetter climate in a significant portion of the State. Average annual precipitation ranges from less than eight inches in desert valleys to over 30 inches in the mountains. About half of annual precipitation is received during the summer period with brief but intense summer storms, commonly referred to as the "monsoon season." Much of the winter precipitation falls as snow in the high mountains and as snow or rain at lower elevations. Average annual snowfall ranges from approximately 3 inches in desert and plains regions to well over 100 inches in mountain areas. Statewide, the annual average precipitation is much less than evaporation from open water surfaces (BOR 1976).

New Mexico's surface waters are located within basins (Figure 2) as defined by the New Mexico Office of the State Engineer (OSE). These surface waters include headwater portions of three of the nation's principal drainage systems: the San Juan River, Lower Colorado River and Gila River basins contribute to the Colorado River, drainage from the Arkansas-White-Red River Basin contributes to the Mississippi River, and the three Rio Grande basins and the Pecos River basin contribute discharge to the Rio Grande. Other streams are in topographically closed basins and drain internally, but are still considered waters of the State. Table 2 summarizes water resource information.

Total annual stream flow averages over 5.7 million acre-feet. Precipitation falling within the State boundaries accounts for 3.3 million acre-feet of this total. Observed average precipitation for water years (October – September) during the period from 1971-2000 was 14.5 inches

(OSE/ISC 2006). Other states, principally Colorado via the Rio Grande and the San Juan River, contribute the rest. Downstream states receive 3.6 million acre-feet from New Mexico (BOR 1976). The state's surface water supply is considered almost fully appropriated to beneficial uses under existing water rights (or reserved for specified beneficial uses under water rights filings), or is needed to meet interstate compact obligations (OSE/ISC, 2003).

Table 2. Summary of New Mexico's Surface Water Resources

Topic	Value
State population[1]	2,085,572
State Surface Area	121,607 mi2
Number of water quality basins	11
Total number of non-tribal stream miles[2,3]	97,911 miles
Perennial non-tribal stream miles[2,3]	6,285 miles
Intermittent/Ephemeral non-tribal stream miles[2,3]	88,810 miles
Ditch/canal non-tribal miles[2,3]	2,817 miles
Stream miles bordering other states[2,3]	0 miles
Number of significant public lakes/reservoirs[2,4]	197
Acres of significant public lakes/reservoirs[2,4]	89,073 acres
Acres of freshwater wetlands[5]	845,213 acres

[1]United States Census Bureau 2014 estimate.
[2]Derived by NMED IT staff based on flowlines lengths and waterbody areas in the USGS National Hydrography Dataset (NHD) Plus V2 (USGS 2012) Land ownership was determined using the Bureau of Land Management surface ownership coverage dated 12/28/15. Reported Assessment Units in Appendix A do not cover every waterbody in the NHD dataset. Water resource information reported by EPA ATTAINs may also differ from information reported by SWQB. These differences can be attributed to the different topographical map scales each agency uses to develop these estimates. Additionally, the two agencies may have used GIS information updated from satellite or aerial photos taken at different times.
[3]Includes both public and private non-tribal stream miles. Flowline segments assigned FCode 46006, 46003, and 46007 were tallied to determine perennial, intermittent, and ephemeral totals, respectively.
Includes significant publicly-owned high-altitude natural lakes, playa lakes, and sink holes as well as lakes and reservoirs in NHD Plus V2 (2012), compared to 2014 satellite images for acreage accuracy.
[5]USFWS National Wetlands Inventory (http://www.fws.gov/wetlands/Data/State-Downloads.html), plus riparian wetland acres. SWQB has wetlands inventory program in place, expected to document >1,000,000 acres.

Approximately 50% of the population of New Mexico relies solely on ground water for their drinking water supply. In some areas with significant ground water use, ground water levels have declined in part due to withdrawals in excess of recharge. In some areas with significant ground water use, ground water levels have declined. Ground water withdrawals from an aquifer by pumping must be balanced by some combination of increased recharge, decreased discharge, and removal from storage (or depletion) (Bartolino and Cunningham, 2003). Ground

water levels may decline in the vicinity of pumping even when withdrawals do not exceed basin recharge because pumping ground water draws down aquifer storage, which can only be replenished by recharge over time once pumping decreases or stops.

B.2 Water Pollution Control in New Mexico's Surface Waters

The New Mexico Water Quality Act (WQA) was adopted in 1967 to protect water quality in New Mexico. The New Mexico Legislature has revised the WQA [NMSA 74-6-1 *et seq*.] numerous times to improve the management and protection of New Mexico's water resources. Several of the revisions expanded the duties and powers of the New Mexico Water Quality Control Commission (WQCC). These duties include adoption of water quality standards and the adoption of regulations to prevent or abate water pollution in the State or in any specific geographic area or watershed of the State or for any class of waters. Under the WQA, water is defined as "all water, including water situated wholly or partly within or bordering upon the State, whether surface or subsurface, public or private, except private waters that do not combine with other surface or subsurface water." The WQCC is the State water pollution control agency for all purposes of the federal CWA and may take all necessary actions under the WQA to secure the benefits of the WQA. [NMSA 74-6-3(E)]

Under the authority of the WQA and the CWA, the WQCC has adopted the basic framework for water quality management in New Mexico. A detailed description of this framework is provided in the *State of New Mexico Statewide Water Quality Management Plan/Continuing Planning Process* (WQMP/CPP) (WQCC 2011). The nine required elements of a WQMP are found at 40 CFR 130.6, and the nine required elements of a CPP are found at 40 CFR 130.5. Table 2 shows how the WQMP/CPP and water quality framework is organized to merge these requirements. The WQMP/CPP is the umbrella document that incorporates by reference the following reports and regulations adopted by the WQCC:

- Ground and Surface Water Protection Regulations [20.6.2 NMAC];
- New Mexico Nonpoint Source Management Program;
- Standards for Interstate and Intrastate Surface Waters [20.6.4 NMAC]; and
- State of New Mexico Integrated Clean Water Act Section 303(d)/Section 305(b) Report.

Responsibilities for water quality management activities are assigned by the WQCC to the constituent agencies, but primarily the New Mexico Environment Department (NMED). Within NMED, the Cabinet Secretary has delegated the responsibilities for water quality management activities involving surface waters to NMED's Surface Water Quality Bureau (SWQB). NMED's Ground Water Quality Bureau (GWQB) has the responsibility for activities involving protection and restoration of ground water quality. A significant exception is that the WQCC assigned the New Mexico Oil Conservation Division of the Energy, Minerals and Natural Resources Department as responsible as lead for the regulation of ground water quality protection associated with oil and gas production. Several other state agencies conduct activities related to water quality, including but not limited to: Office of the State Engineer; Interstate Stream Commission; Department of Game and Fish; Energy, Minerals and Natural Resources Department; Oil Conservation Commission; Soil and Water Conservation Districts; and Department of Agriculture.

The State conducts water quality planning on a statewide level. Nevertheless, some individual programs use a watershed-level focus to augment and better support statewide planning efforts. NMED strives to use an integrated planning and management strategy to protect or attain the desired uses and levels of water quality within a watershed. The fundamental components within this water quality management approach are listed and described in Figure 3. Within the SWQB, the iterative process implemented to identify water quality problems, develop solutions

to address them, and assess the effectiveness of the implemented solutions is shown in Figure 4. Problem identification begins with establishing water quality standards and follows with collecting data to identify impaired waters. Problem solving involves the development of Total Maximum Daily Loads (TMDLs) which help guide NPDES permit limits and Section 319 restoration projects to help a waterbody achieve water quality standards. Each program is an integral part of this approach.

WATER QUALITY STANDARDS
Process for establishing and assuring adequate implementation of new or revised water quality standards.

MONITORING AND ASSESSMENT
Ensure relevant water quality data are collected and assessed with the most robust scientific methods

TOTAL MAXIMUM DAILY LOADS
Budget for pollutant influx to a watercourse in accordance with CWA Sections 303(d) and (e)(3)(C)

EFFLUENT LIMITATIONS
Primary mechanism for controlling point source discharges to surface waters under CWA Section 402

MUNICIPAL AND INDUSTRIAL WASTE TREATMENT
Identification of anticipated municipal and industrial waste treatment works under CWA Section 205(a) and 516(b)(1)

NONPOINT SOURCE (NPS) MANAGEMENT AND CONTROL
Management of NPS pollution under the New Mexico Continuing Planning Process and New Mexico NPS Management Program

MANAGEMENT AGENCIES
Identification of agencies necessary to implement the Water Quality Management Plan and provision for adequate authority for intergovernmental cooperation

IMPLEMENTATION MEASURES
Under CWA Section 208(b)(2)(E), establishment of schedules that specify when pollution control programs are expected to be implemented

DREDGE OR FILL PROGRAM
Control dredge or fill activities through permit actions in accordance with CWA Section 208(b)(4)(B)

BASIN PLANS
Develop state-wide water quality management plan strategies in order to consider specific regional or watershed concerns under CWA Section 209

GROUND WATER
Administer regulations regarding ground water protection

DETERMINATION OF COMPLIANCE WITH WQS FOR THE PROTECTION OF HUMAN HEALTH CRITERIA
Conduct sampling for determination of compliance with surface water quality standards, human health criteria

PUBLIC PARTICIPATION
Provide the public with the information and assistance necessary for meaningful involvement

WETLANDS PROGRAM
Protect and restore wetlands and riparian areas

Figure 3. New Mexico's Water Quality Management Framework Adopted by the WQCC in the WQMP/CPP

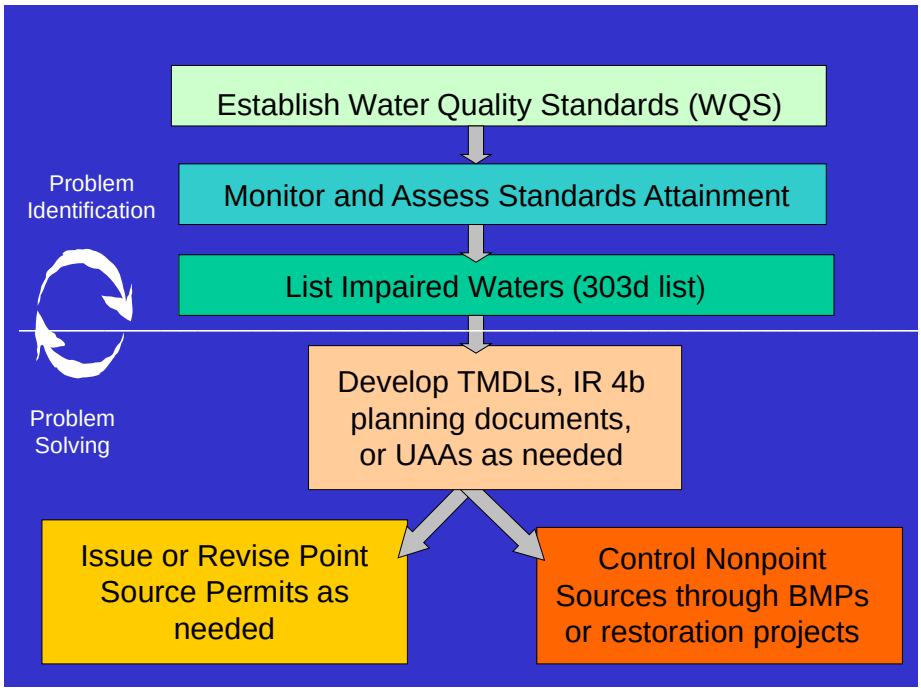


Figure 4. SWQB's General Framework for Identifying and Restoring New Mexico's Surface Waters

Surface Water Quality Standards Program

New Mexico's Surface Water Quality Standards Program maintains and refines the State's surface WQS. The WQS define the water quality goals for a waterbody by designating uses, assigning criteria to protect those uses, and establishing provisions to apply and implement the WQS. New Mexico continually evaluates the WQS using applicable guidance documents, data, public input, and other sources of information to identify sections that may need to be changed or provisions to be added. In accordance with CWA Section 303(c)(1), the State must hold a public hearing to examine the WQS on a three-year basis. This process is known as the "triennial review" and is also governed by the WQA which assigns authority for the adoption of WQS to the WQCC.

The SWQB initiated its current 2013 triennial review with an informal scoping phase for public feedback during April and May of 2013 to identify state priorities and potential changes to the WQS. Proposals for changes were developed into a discussion draft which was noticed for public review and comment during April and May of 2014. During comment periods for both the

scoping phase and public discussion draft, the SWQB received input from the EPA, watershed/river conservation groups, municipalities, water districts, industrial/trade groups, private organizations and citizens. The SWQB also continued to meet and work with various groups whenever requested to address their concerns, which resulted in additional changes. The SWQB presented the 2013 triennial review proposals for WQS changes to the WQCC in a public hearing held during October 13-16, 2015. Approval of proposals by the WQCC is pending and the earliest date for a decision is anticipated in spring 2016. Once approved by the WQCC, these changes will be submitted to EPA for final approval under CWA Section 303(c). WQS proposals under consideration by the WQCC include:

- Segment-specific standards for appropriate aquatic life protections in the Mimbres and San Juan River basins;
- A new temporary standards provision;
- Updates to the piscicide provision for applications under EPA's NPDES program, and to ensure public involvement before applications that are not covered under EPA's NPDES program;
- Secondary contact uses and criteria updates to primary contact uses and criteria in some segments based on CWA 101(a) requirements and the EPA's most recent recommendations for recreation uses and criteria;
- Listing of ephemeral waters under Section 20.6.4.97 NMAC pursuant to Subsection C of Section 20.6.4.15 NMAC; and
- Clarifications of criteria applicability, updates to methods, and corrections of grammatical errors.

For additional information on New Mexico's water quality standards, visit: http://www.nmenv.state.nm.us/swqb/Standards/

Monitoring and Assessment Program

The purpose of SWQB's Monitoring and Assessment Program is to ensure relevant water quality data for all of New Mexico's surface waters are collected and assessed with the most robust scientific methods in a way that is transparent to water quality agencies and the public. The Program serves all surface water quality management needs to the extent possible given available resources, NMED priorities, and strategic goals. The waterbody types monitored by the program include streams, rivers, lakes, reservoirs, and wetlands.

New Mexico has adopted a strategy to maintain up-to-date evaluations of the State's surface waters with fewer resources than were available a decade ago. This strategy is summarized in *State of New Mexico Surface Water Quality 10-Year Monitoring and Assessment Strategy* (NMED/SWQB 2010). Surface water quality data collected during rotational water quality surveys are integral to implementing this framework for identifying and restoring impaired surface waters, and protecting unimpaired surface waters. This process is described in greater detail in Part C of this document.

For additional information on New Mexico's water quality monitoring and assessment, visit: http://www.nmenv.state.nm.us/swqb/MAS/

Total Maximum Daily Load Program

As discussed earlier, CWA Section 303(d)(1) requires that states develop a list of waters within the State that are not supporting their designated uses established in the WQS and to establish a total maximum daily load (TMDL) for each pollutant for those "impaired waters." To accomplish this latter requirement, New Mexico develops a TMDL planning document -- a comprehensive plan for a given pollutant and waterbody starting from the relevant WQS, discussing existing water quality data and developing plan to ensure that WQS are achieved and maintained for that waterbody. At the core of a TMDL is the allocation of pollutant loads to existing and reasonably foreseeable increases from point sources and nonpoint sources in the watershed. As such, TMDLs are an integral part of New Mexico's WQMP/CPP. They also inform the EPA in developing effluent limits for NPDES permits, and help guide NMED in prioritizing watershed protection and restoration projects funded under the CWA Section 319.

Outside groups also recognize the importance of TMDL development in protecting New Mexico's surface waters. In 1996, the EPA was sued by two citizen groups to force the development of TMDLs in New Mexico. A settlement agreement and consent decree were negotiated in 1997 to settle the litigation, and established a 20-year timeline for developing TMDLs for waters identified as impaired on the 1996-1998 *List of Impaired Waterbodies*. NMED received EPA approval of the final TMDL under the Consent Decree in 2007, and the Consent Decree was officially dismissed on April 21, 2009. New Mexico has continued to develop TMDLs. Since the previous listing cycle, New Mexico has completed TMDLs for the Upper Rio Grande watershed (9), Upper Pecos River watershed (7), and the Animas River watershed (4). NMED also received EPA approval to remove a TMDL for aluminum on the Red River.

The NMED is actively involved in national conversations with EPA and the Association of Clean Water Administrators (ACWA) regarding the new Long Term Vision for the CWA 303(d) Program. The goals of the new Vision are prioritization of watershed or waters for restoration and protection; assessment of priority waters; protection of unimpaired waters; alternative approaches to restoration and protection; engagement with the stakeholders; and integration with other CWA programs. As a result of the new Vision and goals, the TMDL program in New Mexico is being revised to allow a greater focus on state water quality priorities, encourage TMDL alternatives, and emphasize the value of protecting waterbodies that are not impaired. This document, referred to as a Prioritization Framework, summarizes the prioritization of monitoring and TMDL activities in New Mexico. The Framework was provided to EPA Region 6 staff for review in January 2015 and comments received from EPA were addressed as appropriate and are incorporated in the Framework document available on the SWQB TMDL website at: https://www.env.nm.gov/swqb/TMDL/FinalDraft-PrioritizationFrameworkStrategy-NewMexicoJuly2015.pdf. The Prioritization Framework is a guidance document to be used by SWQB for monitoring and TMDL planning; it is not a static document and can be updated during the 2016-2022 timeframe if necessary. The list of TMDL priorities through 2022 were determined using the process outlined in the Framework and were provided to EPA Region 6 in July 2015, and included as Appendix C. The portion of these TMDL priorities to be developed annually will be provided to EPA Region 6 at the beginning of each federal fiscal year.

All of New Mexico's TMDLs are incorporated into the State's WQMP/CPP and available on the SWQB web site: http://www.nmenv.state.nm.us/swqb/TMDL/List/.

Point Source Regulation Program

The NPDES Program as established in CWA Section 402 is responsible for the protection of surface water quality by regulating point source discharges of pollutants to surface watercourses. Point source pollution results from discharge of contaminants through discrete conveyances such as pipes. The primary goal of the Point Source Regulation Section (PSRS) is to protect public health and the environment by assuring that regulated point source discharges to surface waters of the State comply with appropriate State and federal statutes and regulations, including applicable water quality standards and applicable wasteload allocations developed through the TMDL process.

The EPA develops, issues, and enforces NPDES permits in New Mexico. Although the State of New Mexico does not have the authority to implement the CWA Section 402 program for discharges, NMED's PSRS has been certified by EPA to conduct compliance inspections on behalf of EPA and to serve as a local point of contact for providing information to operators and other agencies regarding the federal regulatory program. Figure 5 illustrates the distribution of NPDES permitted facilities by type, number, and percentages. The inspections help to ensure compliance with applicable effluent limitations and permit conditions, and are carried out in accordance with the EPA NPDES Compliance Inspection Manual (EPA 2004) using current, EPA-approved forms and checklists. The data collected are used in compliance evaluation and in support of state or federal enforcement and permitting activities. NMED's PSRS conducted 66 NPDES storm water and waste water compliance inspections in federal fiscal year (FY) 2014 (October 1, 2013 – September 30, 2014), and 86 in federal FY2015.

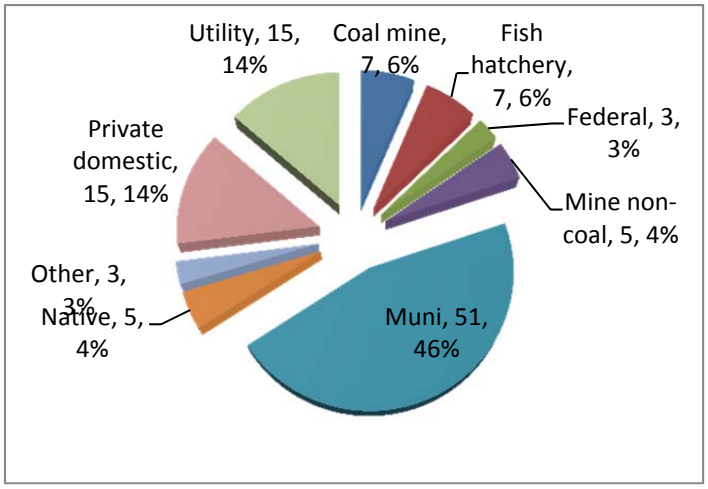


Figure 5. Distribution of NPDES permits in New Mexico (111 permits total)

In addition to conducting individual permit inspections, the NMED's PSRS also conducts both construction site and industrial facility stormwater inspections in accordance with the Construction General Permit or the Multi Sector General Permit. The NMED's PSRS conducts outreach to construction site and industrial facility owners and operators to inform them of requirements under the CWA. The NMED's PSRS also assists with implementation of the MS4 permitting program in New Mexico. PSRS has assisted EPA over the past five years in implementing the Watershed-Based MS4 permit in the Middle Rio Grande (issued December 2014) and will provide assistance conducting audits of these programs as needed.

State certification of federal permits is required under CWA Section 401 and ensures the permits are compatible with state and federal laws, protect the State's WQS, and implement the WQMP/CPP. In New Mexico the most common federal permits are issued under Section 402 (NPDES) and Section 404 (Dredge-or-fill issued by USACE). The PSRS fulfills this responsibility for New Mexico for 402 permits, certifying 18 NPDES permits in state FY 2012 and 17 permits in state FY 2013. A significant regulatory change occurred in 2011 when the WQCC adopted regulations addressing certification. The new regulations codified for the first time the procedures to be used by NMED for certification of CWA Section 402 and Section 404 permits. The new regulations in 20.6.2 NMAC went into effect on May 18, 2011, making state FY 2012 the first full year during which these regulations were used.

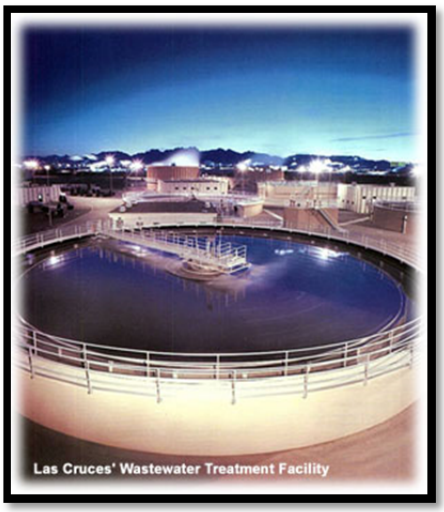
As noted above enforcement of Section 402 NPDES permits in New Mexico is the responsibility of EPA. EPA conducted 12 NPDES enforcement actions in state FY 2014 and 15 in FY 2015, most of which were based on State inspection reports. State enforcement of NPDES permitted discharge is possible but has not occurred. State enforcement would be based in large part upon meeting the applicability requirement of 20.6.2.2100 NMAC, on the discharge resulting in a violation of a state water quality standard or regulation, or both. The regulatory applicability clause is designed to prevent dual regulation by state and federal government, while still allowing the State to act in cases where the federal program has been unable to gain compliance within a prescribed time. The state may also enforce provisions of 20.6.2.2201 NMAC prohibiting disposal of refuse in a watercourse, which are not subject to the applicability clause. The NMED has authority to issue compliance orders, including penalties, for any discharge that results in a violation of a water quality standard or regulation under 20.6.2.1220 NMAC.

The PSRS has been successful over the years in improving and protecting water quality, in that today a very small percentage of New Mexico's surface water quality impairments are attributed to point sources of water pollution. However, poorly operated or maintained treatment plants continue to cause adverse effects on water quality in local areas, in part due to limited funding to implement technological improvements or upgrades to treatment facilities.

For more information on the Point Source Regulation Program, see http://www.nmenv.state.nm.us/swqb/PSR/.

Utility Operators Certification Program

NMED administers the Utility Operators Certification (UOC) Program pursuant to the New Mexico Utility Operators Certification Act, NMSA 61-33-1 *et seq*. This program is responsible for training, testing, and certification of public water and wastewater system operators.


Las Cruces' Wastewater Treatment Facility

The Utility Operator Certification Program ensures that the roughly 3,300 active operators of Drinking Water Systems and Wastewater Treatment Systems in New Mexico are appropriately trained and qualified through:

- Tracking required continuing education credit hours (10 hours/year/operator) – over 46,500 and 48,000 hours were recorded in state FY13 and state FY14 ;
- Increasing the number of certifications through examinations that ensure the necessary knowledge and ability of all operators –1,204 and 1,102 exams were conducted resulting in 685 and 420 certifications in state FY13 and state FY14, respectively; and
- Tracking the number of certified operators who renew each certificate held (renewal required every three years) –1,204 and 1,099 operators renewed their certification in state FY13 and state FY14, respectively.

The UOC Program has developed four study manuals for operators that comprehensively cover the technical aspects of water and wastewater treatment operations to assist them in studying for certification examinations. They include the Wastewater Study Guide, Water Study Guide, Wastewater Laboratory Study Guide, and Water Sampling Study Guide. The Program has made these study manuals available online. In addition, each year UOC Program staff provide approximately 40 hours of instruction at training events for certification of new operators and renewal of certification for existing operators. The UOC Program also provides technical assistance to operators and treatment facilities throughout New Mexico.

For more information on the Utility Operators Certification program, see http://www.nmenv.state.nm.us/swqb/UOCP/.

Nonpoint Source Management Program

While the focus of regulation under the Clean Water Act for surface water quality pollution is on point sources, the majority of water quality impairments identified in New Mexico's streams and rivers continues to be due to nonpoint sources of water pollution. Nonpoint source (NPS) pollution can be directly related to land use practices on a broad geographic scale and is generally caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up natural and human-caused pollutants, which are deposited into rivers, lakes, wetlands and ground water. In New Mexico, nonpoint sources of pollution include, but are not limited to: agriculture, construction activities, grazing, malfunctioning septic systems, recreational activities, resource extraction, riparian habitat modification, roads, silviculture/forest management, streamflow modification, and stormwater runoff from developed areas.

NMED's Nonpoint Source Management Program is designed as a cooperative effort among watershed stakeholders and NMED's SWQB Watershed Protection Section (WPS) to educate and implement best management practices (BMPs) to reduce nonpoint pollutants entering surface and ground waters. A plan for the Nonpoint Source Management Program was developed in 2014 and approved by EPA in early 2014 (NMED/SWQB 2014a), and a draft revised plan is currently under development. Both the current and draft revised plans state an overall goal of meeting and maintaining water quality standards and designated uses of surface water and ground water resources in New Mexico. The plan's objectives are directed toward meeting this goal, and are related to planning, restoring and protecting surface and ground water quality, education, and interagency cooperation.

The NPS Management Program emphasizes watershed-based planning, as described in EPA's *Nonpoint Source Program and Grants Guidelines for States and Territories* (EPA, 2013). Such planning is a tool that NMED encourages to be used by any watershed restoration program whose intent is to benefit water quality. NMED underscored its encouragement by making watershed-based planning a requirement for significant restoration activities to be funded with CWA Section 319(h) funds. The focus of planning and implementation is on impaired waters with approved TMDLs, and on a limited group of impaired waters for which TMDL development is not required because the impairment is thought to be caused by insufficient flow (*i.e.,* Category 4C streams) , and an even more limited category of streams where existing plans are thought to be sufficient such that a TMDL is not required (Category 4B streams). Watershed-based plans are used by local watershed groups to build on the TMDL process with more detailed characterization of pollutant sources, management measures, information and education programs, and monitoring. The approach facilitates coordinated watershed restoration efforts, the development of effective watershed associations, engaged stakeholders, and the implementation of effective BMPs to reduce NPS pollution. Through a combination of funding programs, partnerships, education and outreach activities, New Mexico is able to get interested parties to implement BMPs to control or reduce the degree of water quality impairments. Table 3 provides some examples of best management practices encouraged by the Program.

Since 1998, the NPS Management Program has implemented over 100 watershed restoration projects, developed 34 Watershed Restoration Action Strategies, and helped foster the formation of 27 focused watershed groups present in communities throughout New Mexico. The state currently has ten CWA Section 319-funded planning or restoration projects in progress. Typically restoration projects take at least three years to complete, and several more years to see the full benefits. Of the ongoing projects, three projects are funded with FY 2012 funds, two projects are funded with FY 2013 funds, three projects are funded with FY 2014 funds, and two projects are funded with 2015 funds. See Figure 6 for locations of CWA Section 319 projects completed and initiated in calendar year 2015.

The NPS Management Program includes other activities that protect water quality. One such activity is the Program's coordination with the USACE to implement the State's CWA Section 401 certification responsibilities for Section 404 permits. These federal permits are required for persons conducting "dredge or fill" activities in a water of the United States, and are designed to protect the waters from degradation due to NPS pollution associated with such activities. In 2012, NMED certified a new set of Nationwide Section 404 Permits. Eighty CWA Section 401 water quality confirmations, certifications, or other actions were completed in 2014. The Program also coordinates with the New Mexico Energy, Minerals, and Natural Resources Department to implement portions of the New Mexico Mining Act pertaining to water quality. Finally, the Program supports or implements several outreach activities throughout the year, including publication of the quarterly newsletter *Clearing the Waters*, development and maintenance of SWQB web pages devoted to NPS pollution, conducting wetlands roundtable meetings and technical meetings on topics such as beaver management and playa science, numerous workshops through individual CWA Section 319 projects, and presentations for school and community groups.

The NPS Management Program also relies on established resource protection programs, national and state NPS pollution prevention programs, and activities of other land management and resource protection agencies to address NPS pollution. New Mexico identifies programs and activities that will facilitate the achievement of surface water quality criteria, using a voluntary approach to implement water quality improvements. For example, coordination

between the U.S. Forest Service and the WPS continues to be an integral part of the NPS Management Program and has facilitated cooperation on many successful NPS pollution reduction projects.

Wetlands Program Development Grant: Volunteers from Albuquerque Wildlife Federation dig a worm ditch to spread water across the surface of a slope wetland in order to increase wetland acreage. Location: Valle Seco, Valles Caldera National Preserve.

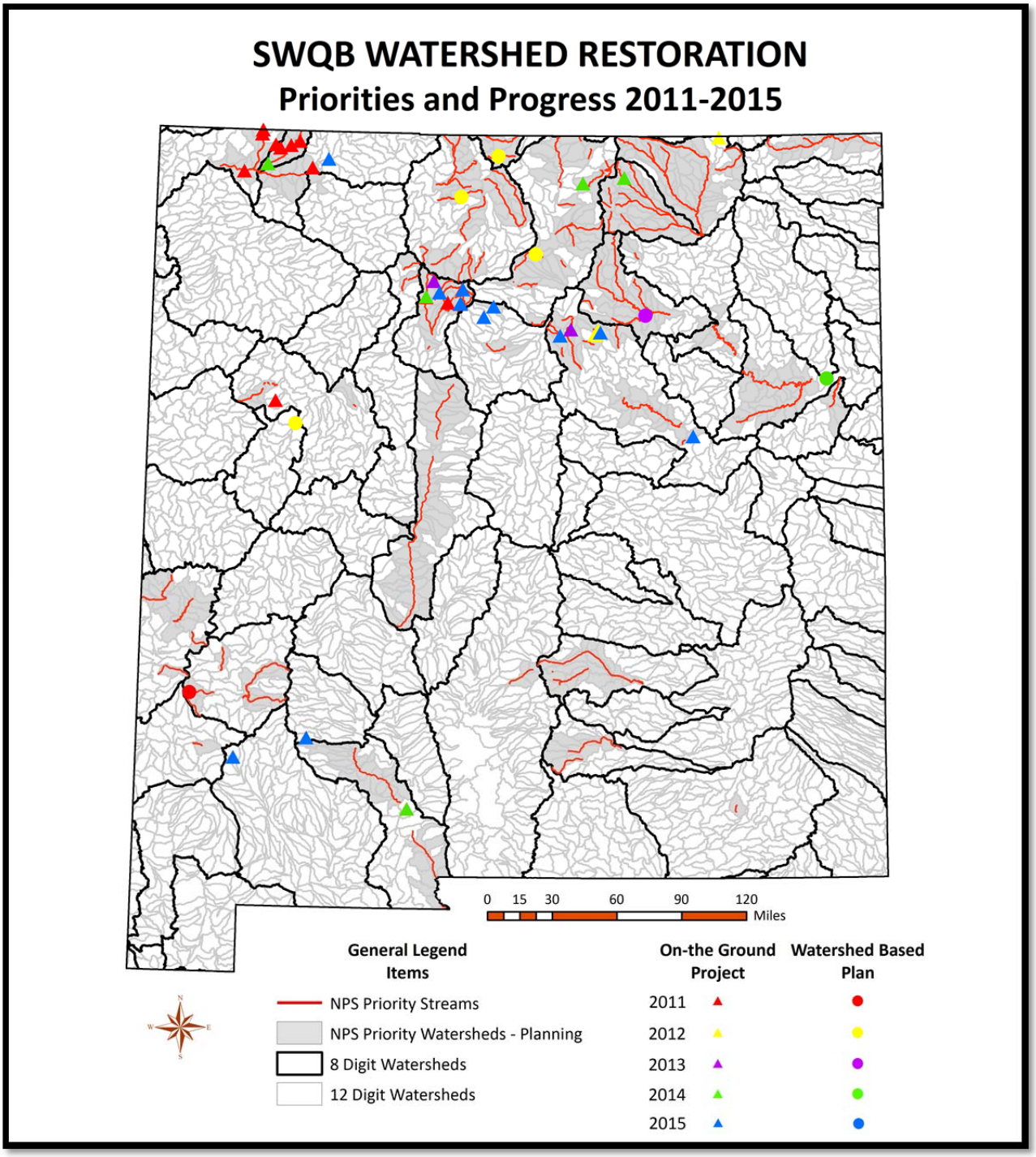


Figure 6. CWA Section 319(h) Funded Projects Started in Years 2011-2015

Table 3. Example BMPs Implemented Throughout New Mexico

NPS Pollution Category	Examples of BMPs implemented in New Mexico to address Specified Type of NPS Pollution
Agriculture	• Residue Management (Contour strip cropping, stubble munching, conservation tillage) • Improved irrigation practices (low output sprinklers, tailwater recovery, vegetation control) • Agricultural Chemical Handling Facilities • Nutrient Management (split fertilizer applications, nutrient balancing, crop rotation) • Minimize pesticide impacts (biological control mechanisms, using least toxic substances, apply in accordance with label instructions and legal requirements)
Construction	• Sediment Control Structures (silt fences, hay bales, sediment retention ponds) • Heavy equipment cleaning and spill kits • Conduct construction activities during no-flow or low-flow conditions • Composted mulch berms and socks
Fire Suppression/Fuels Management	• Forest thinning / fuels reduction • Post wildfire watershed rehabilitation • Meadow rehabilitation
Grazing	• Alternate watering sources (trick tanks, upland dirt tanks, and upland wells) • Planned/rotational grazing • Fencing (pasture cross fencing and creation of additional pastures for improved stock rotation methods and riparian exclosure fencing) • Development of springs • Cattle guards • Herding • Creating ponds • Forest thinning/brush clearing
Loss of Riparian Habitat	• Habitat restoration and rehabilitation - Removal of non-native plant species - Planting native vegetation • Grazing exclosures or planned grazing
Recreational Activities	• Revegetation of impacted areas • Trail maintenance/reconstruction • Provide and maintain waste and sanitation facilities • Limit off road vehicle use • Restrict vehicular access to riparian areas • Recreational area closure or relocation • Education/Outreach
Resource Extraction	• Sediment Control Structures (silt fences, hay bales, sediment retention ponds) • Treatment of acid mine drainage • Stabilizing, relocating, and channeling runoff around mine and mill tailings

Table 3. Example BMPs Implemented Throughout New Mexico (continued)

NPS Pollution Category	Examples of BMPs implemented in New Mexico to address Specified Type of NPS Pollution	
Septic Systems	• Identify and replace malfunctioning systems • Outreach to encourage preventative maintenance • Connect to centralized wastewater treatment system	
Streambank Modification/ Hydromodification	• Streambank Stabilization - Revetment (e.g. vanes, j-hooks) - Grade control (e.g. cross vanes) - Grazing exclosures or planned grazing	- Terracing / revegetation of slopes - Installing vortex weirs - Replacing culverts - Brush control
Urban Stormwater	• Education/Outreach activities • Develop stormwater management plan at local level • Propose new ordinance and/or development codes	• Propose new construction standards • Install swales, French drains, detention ponds • Collect and treat runoff

New Mexico received approximately $2.3 million in federal CWA Section 319(h) funds per year for several years to administer and implement the NPS Management Program. This support decreased by 18% in state FY2013 and remained at that level in 2014 and 2015. These funds are enhanced through the 40% non-federal match required for all recipients of CWA Section 319(h) grants. The contractor for one relatively large watershed-based planning project developed in 2012 withdrew their proposal, and a similar project was developed in 2013 using funds that would have been obligated in 2012, accounting for the larger total in 2013 and relatively high proportion of funding directed to watershed-based planning in 2013 (see Figure 7). "On-the-ground" projects are an increasing priority of the program, as watershed-based plans are completed. Watershed-based planning projects remain a significant component of the nonpoint source management program and, with few exceptions, CWA Section 319 funds are the main source of support for these project in New Mexico. The "Planning and Education" category in Figure 7 includes approximately $59,000 for the 2010 New Mexico Watershed Forum (which began in FY2010) and $37,000 for the 2012 New Mexico Watershed Forum (which began in FY 2012); the remainder in all six years is for watershed-based planning projects. Figure 8 depicts the funding distribution for projects completed in calendar year 2015. Other funding for implementation of the Program is obtained from a combination of federal, state (including River Stewardship Program; see below section), local, and private sources. CWA Section 319 projects that are began in calendar year 2015 are listed in Table 4.

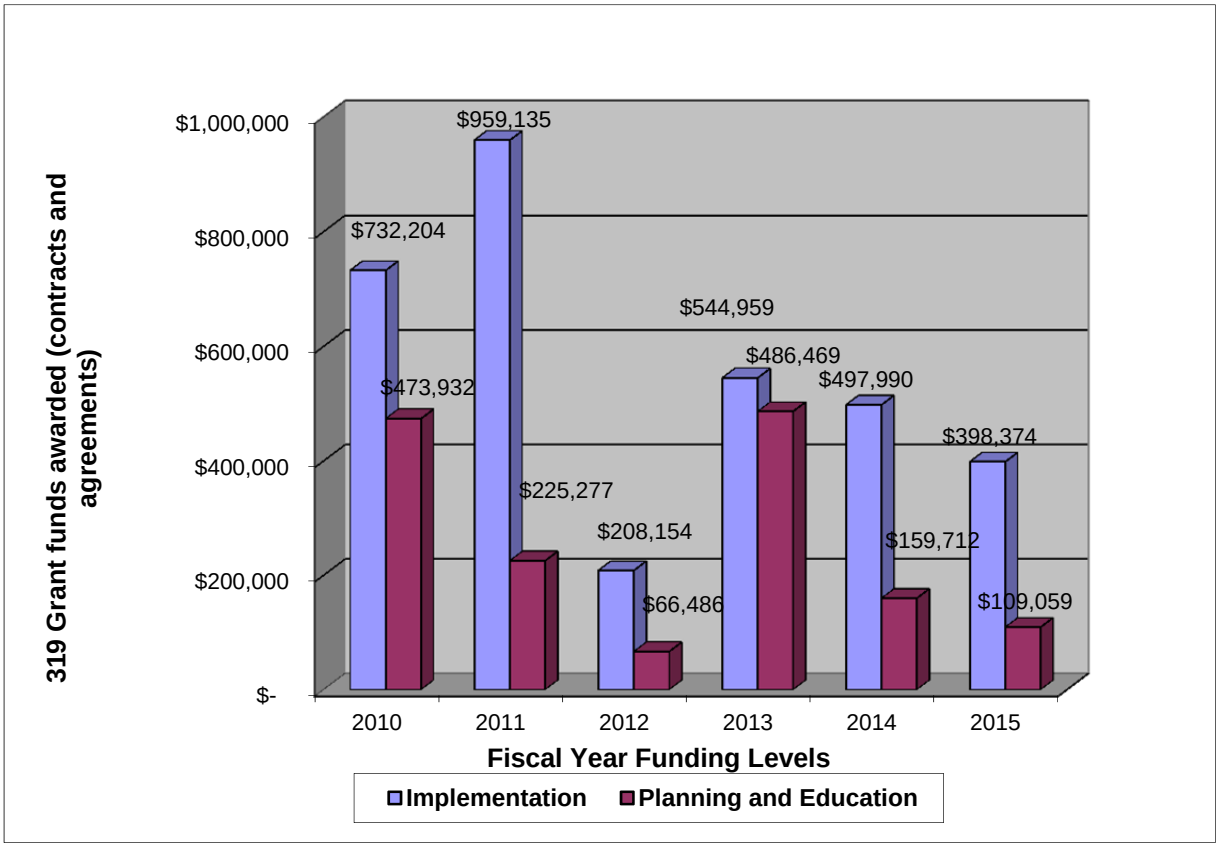


Figure 7. CWA Section 319(h) Funding Distribution by NPS Pollution Category

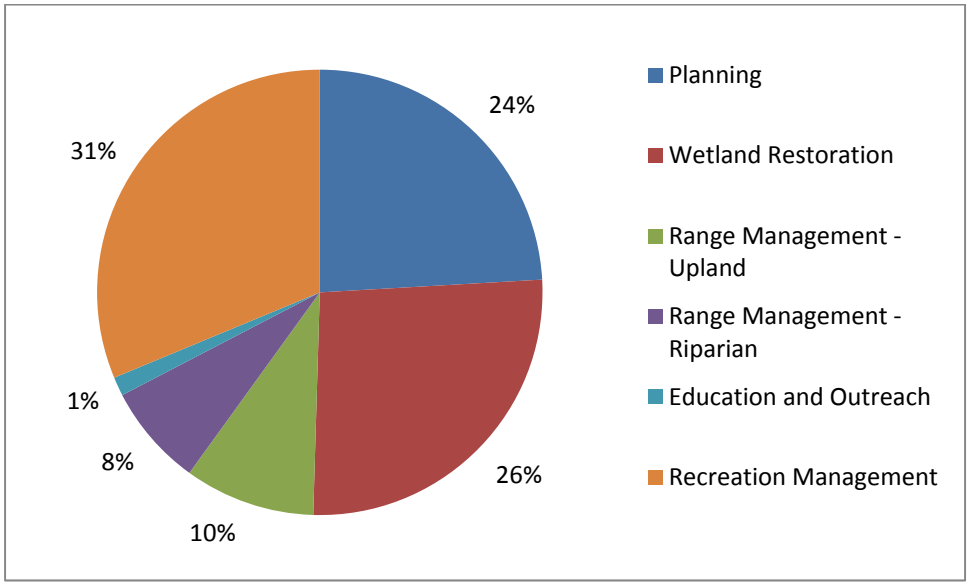


Figure 8. CWA Section 319(h) Funding Allocation (Projects Completed in Calendar Year 2015)

By implementing the NPS Management Program, New Mexico is working to achieve measurable results in the areas of 1) reduced NPS pollutant loadings and reduced number of NPS impaired waterbodies, 2) successful implementation of TMDLs and watershed-based plans, and 3) protected ground water resources for municipal, domestic and agricultural uses. Due to the widespread distribution and dynamic nature of nonpoint source pollution, reducing pollution sources requires the concerted effort of all people who spend time in the watershed. Individuals and communities must understand how human activities affect water quality and learn how to actively participate in reducing sources of pollution to protect water resources. Additional information about how the NPS Management Program is coordinated and implemented throughout the State can be found in the *New Mexico Nonpoint Source Management Program Plan* (NMED/SWQB 2014a).

Table 4. CWA Section 319(h) Projects Beginning in Calendar Year 2015

Project Name	Project Description	Combined Cost
Ute Reservoir Watershed-Based Plan for Water Quality Restoration	The Canadian River Soil and Water Conservation District, working with the Eastern New Mexico Water Utility Authority, local landowners, and local agencies such as the Tucumcari Agricultural Science Center of NMSU, is developing a watershed based plan to implement the nonpoint source components of the nutrient and *E. coli* TMDLs in the Canadian River (between Ute Reservoir and Conchas Rerervoir) and Pajarito Creek.	$196,015 (Section CWA 319 and match)
Upper Gallinas River Monitoring	The Hermits's Peak Watershed Alliance (HPWA) is conducting medium-term water quality monitoring of the upper Gallinas River in support of the National Water Quality Initiative (NWQI). NWQI is a program of the Natural Resources Conservation Service, and EPA has asked all states to take responsibility for monitoring in one NWQI watershed.	$42,455 (Section CWA 319)
Upper Jaramillo Creek Water Quality Improvement Project	The WildEarth Guardians are implementing this project on Jaramillo Creek within the Valles Caldera National Preserve. The project consists of construction of several cow and elk exclosures, and planting of willows and other riparian plants within the exclosures, to partially implement turbidity and temperature TMDLs for Jaramillo Creek.	$378,318 (Section CWA 319 and match)
Riparian Restoration along the Rio Cebolla, NM with Emphasis on Sediment Reduction	Rocky Mountain Ecology (a private contractor) is implementing this project along the Rio Cebolla upstream of Fenton Lake in the Jemez Mountians, on land managed by the Santa Fe National Forest. The project consists of construction of drift fences and upland water sources to encourage better livestock distribution, and reclamation of approximately 10,000 feet of unauthorized two-track roads.	$292,116 (Section CWA 319 and match)

Additional information describing the Nonpoint Source Management Program can be found in the *New Mexico Nonpoint Source Management Program* (2014a).
http://www.nmenv.state.nm.us/swqb/wps/Plan/index.html

Information on work completed in specific years can be found in *State of New Mexico Nonpoint Source Management Program Annual Reports*.
http://www.nmenv.state.nm.us/swqb/wps/AnnualReports/index.html

Information on projects funded through CWA Section 319 and the state-funded River Stewardship Program is available on EPA's Grants Reporting and Tracking System www.env.nm.gov/swqb/wps/GRTS) Current projects appear under grants awarded in federal fiscal years 2012, 2014, and 2016.

Effectiveness Monitoring Program

An important goal of the WPS is to monitor the effects of non-point source pollution control projects on water quality. These projects are primarily stream restoration measures funded under CWA Section 319, but also include projects funded by NMED, River Stewardship Program, and the SWQB Wetlands Program.

Effectiveness monitoring has focused primarily on projects addressing stream temperature impairments in mountain streams in northern and central New Mexico. Temperature monitoring is currently ongoing on the following streams: Bluewater Creek, Rio de Los Pinos, Ponil Creek, Rito Peñas Negras, Rio de las Vacas, Redondo Creek, Jaramillo Creek, San Antonio Creek, and Cow Creek.

The stream temperature data provides the basis for a statistical analysis using the before/after upstream/downstream study design, in which the relationship between the upstream and downstream stations is tested for a significant difference before and after restoration. A common restoration technique is to exclude cattle and elk grazing by building fence exclosures and planting native vegetation to bring back the riparian cover. Initial results from the data analysis indicate that peak summer temperatures in many streams have improved, but still exceed the associated water quality criterion of 20°C for coldwater aquatic life. However, the projects are expected to have beneficial effects which will continue to increase as vegetation continues to grow. Although this technique is expected to be effective, there is a significant lag time between planting and sufficient vegetation growth to effectively shade the stream. Data collection and analysis will be continued to account for this lag time.
Another aspect of the Effectiveness Monitoring Program is the ongoing review of the State of New Mexico 303(d)/305(b) Integrated List for Assessed Surface Waters, with an emphasis on delistings associated with NPS pollution control projects. As a result several streams were recently officially recognized as Non-point pollution Success Stories: Sitting Bull Creek and Willow Creek. Additionally a Success Story nomination has also been submitted for Polvadera Creek.

For more information on the WPS Effectiveness Monitoring Program, see https://www.env.nm.gov/swqb/wps/Effectiveness/.

River Stewardship Program

The goal of the River Stewardship Program (RSP) is to fund projects that enhance the health of rivers by addressing the root causes of poor water quality and stream habitat. In 2014, the New Mexico Legislature appropriated $2.3 million in capital outlays funds. In 2015 the legislature appropriated $1 million. Objectives of the RSP include:

- Restoring or maintaining hydrology of streams and rivers to better handle overbank flows and thus reduce flooding downstream;
- Enhancing economic benefits of healthy river systems such as improved opportunities to hunt, fish, float or view wildlife; and
- Providing state matching funds required for federal CWA grants.

Responsibility for the RSP lies with the SWQB Watershed Protection Section, and operates within the Nonpoint Source Management Program. Projects are selected through a request for proposals (RFP) using the State's procurement system and there is broad eligibility to apply for funding.

RSP projects are distributed statewide. Recent priority areas include: 1) projects that address water quality and stream habitat impacts associated with fires in 2011, 2012, or 2013; 2) projects that advance source water protection of public drinking water supplies that utilize surface water; and 3) projects that improve urban water quality and stream habitat. Figure 9 depicts the 2014 RSP priority areas.

Request for Proposal (RFP) evaluation criteria ensure that projects are technically sound, community-based and stakeholder-driven. Evaluation criteria favor projects that improve water quality, enhance fish and wildlife habitat, support local economies, and that reduce downstream flood hazard. The proposal evaluation committee consists of representatives of the SWQB and other natural resource management agencies.

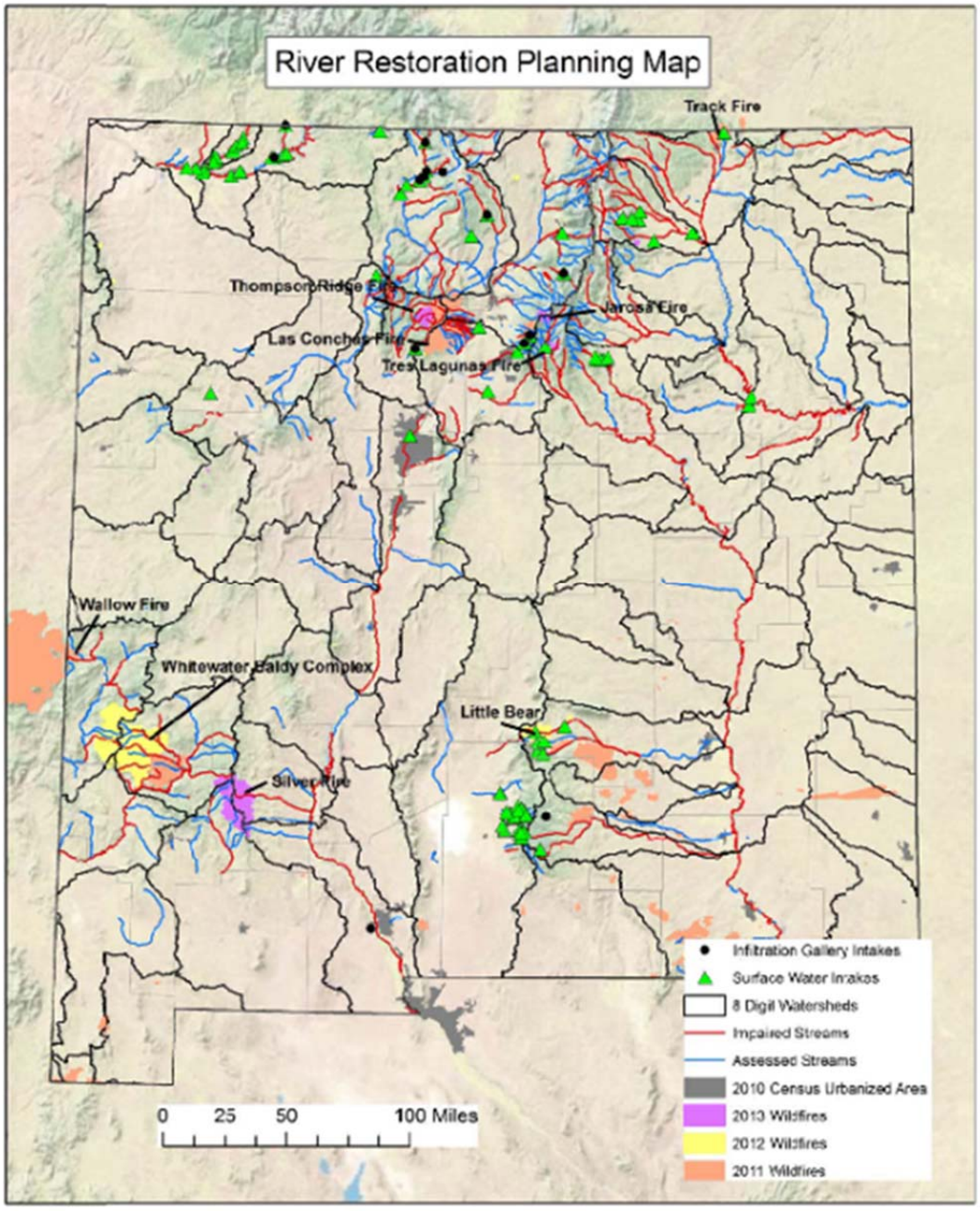


Figure 9. River Stewardship Program Priority Areas (2014)

The projects for the 2015 appropriation will be selected during winter of 2016. Below is a list of the twelve projects selected for the 2014 appropriation:

- **El Rito Creek Habitat Enhancement and Bank Stabilization Project -** The City of Santa Rosa will improve in-stream fish habitat, stabilize creek banks, and remove invasive trees along a 0.35 mile stretch of El Rito Creek.

- **Gallinas Village River and Floodplain Restoration -** The Hermit's Peak Watershed Alliance will implement this project, which entails significant in-stream restoration, creating side channel wetlands, rerouting floodwaters to a currently inaccessible floodplain, and building a flood water detention area.

- **Middle Jaramillo Creek Water Quality Improvement and Riparian Restoration Project –** The WildEarth Guardians will improve water quality and riparian functionality in Jaramillo Creek, on the Valles Caldera National Preserve. Providing direct shade over the stream surface will moderate and reduce water temperatures, while constructed exclosures will protect the re-established and planted streambank vegetation from grazing by cattle and elk.

- **Middle Percha Creek Silver Fire Rehabilitation Project -** The Sierra Soil and Water Conservation District (SWCD) will implement rehabilitation efforts on Middle Percha Creek within the burn scar of the summer 2013 Silver Fire.

- **Pecos River In-stream and Riparian Restoration -** The Upper Pecos Watershed Association will perform stream geomorphology restoration to address post-Tres Lagunas Fire and flood impacts, increasing sinuosity and water depth, thereby reducing water temperature and improving fish habitat.

- **Post-Fire Restoration of the Rito de los Frijoles at the Bandelier National Monument Visitors' Center -** Keystone Restoration Ecology will perform channel and floodplain restoration on the Rito de los Frijoles to improve stream function, stabilize the stream channel, create an accessible floodplain and increase habitat diversity with riparian plantings.

- **Red River Town Park Restoration Project -** The Town of Red River will restore a half mile of the Red River in the heart of downtown. Objectives include measurably restoring the balance of erosion and sedimentation, improving the riparian corridor for terrestrial and avian species, increasing fish-holding capacity, and increasing recreational opportunities.

- **Restoring Hydrologic Functioning to the Rito de los Indios, Valles Caldera National Preserve -** Los Amigos de Valles Caldera will restore channel form and function, lower temperature, and reduce sediment on the Rito de los Indios and tributaries burned by the Las Conchas Fire.

- **Rio Grande Corridor at Buckman Phase II -** Rio Grande Return will implement Phase II of the "Habitat Restoration and Specification Plan for the Rio Grande Corridor at Buckman." Eight acres of riparian area will be restored along 0.75 river miles.

- **San Juan River Restoration Project -** The San Juan SWCD will restore areas along the San Juan River below Navajo Dam by removing nonnative trees such as Russian olive and salt cedar, and restoring the river's riparian areas by planting willows, cottonwoods, and native grasses.

- **Track Fire Burn Area Perennial Stream Restoration Project –** The City of Raton will rehabilitate Segerstrom Creek, a perennial stream located within the Track Fire Burn Area. The project goals are to restore the creek to its proper geomorphology and restore the floodplain while mitigating head cutting and the resulting adverse effects on the surrounding floodplain and to decrease sediment transport into Lake Maloya.

Information on these and other projects can be accessed at: www.env.nm.gov/swqb/wps/GRTS. The River Stewardship Program projects are currently listed under the 2014 grant for New Mexico, and are indicated with "RSP" in their titles.

Pecos River Restoration at El Valle: This cross vane on the upper Pecos River was constructed with heavy equipment to control the grade of the river bed, create habitat, and improve aeration.

For more information on River Stewardship Program, see:
https://www.env.nm.gov/swqb/RiverStewards/

River Stewardship Project: San Vicente Creek Urban Watershed Restoration

Stormwater basin adjacent to Noble Park, Silver City, before and after treatment

San Vicente Creek flows from the north to the south through downtown Silver City. This urban stream reach is deeply incised. Better stormwater management practices, some which will be utilized on this project, have been documented to address common water quality concerns in urban settings. To implement this River Stewardship Project, project partners first had local volunteers help map locations where stormwater harvesting basins could be installed to help keep urban stormwater runoff from directly entering San Vicente Creek. After developing a plan, approximately 80 small stormwater harvesting basins and rolling dips were proposed throughout Silver City to help collect stormwater, capture sediment and other pollutants, and increase infiltration to vegetation. To date, numerous structures have been successfully installed on the town's right of ways, such as the curb enhancement above at Noble Park. This public property curb cut/enhancement includes an infiltration basin and overflow to the park turf which was designed to capture and utilize urban stormwater runoff rather than let it drain to San Vicente Creek.

Lower Rio Grande Program

NMED and the Interstate Stream Commission (ISC) are working cooperatively to develop solutions to concerns regarding the quality of the water in the Lower Rio Grande (LRG) of New Mexico. Elevated salinity in the Rio Grande Project area, which extends from above Elephant Butte Reservoir, New Mexico, to Fort Quitman, Texas, has long been recognized. The problems associated with elevated salinity are increasing due to rapid urban growth in the El Paso/Ciudad Juárez International Border area and increasing demand for potable water. The utilization of water resources in the Rio Grande Project area is restricted where highly saline water results in reduced potable water supplies, smaller crop yields, as well as soil and ground water deterioration.

The SWQB designed and implemented a salinity monitoring network in the LRG from 2005 to present. The network is designed to improve understanding of salinity and the processes effecting changes in salinity in the Rio Grande from above Elephant Butte Reservoir at San Marcial, downstream to Courchesne Bridge near El Paso, Texas. The LRG Program conducts water quality investigations targeted on salinity control solutions; identifying sources of salinity; focusing response efforts in this critical border region; and providing the technical basis for an effective salinity control program.

NMED and ISC facilitated the formation of Rio Grande Salinity Management Coalition (Coalition) consisting of water managers from Texas and New Mexico, the Rio Grande Compact Commission, and water user groups from Colorado, New Mexico and Texas that are actively working together to reduce and manage salinity in the Rio Grande Project area. In 2009 the USACE completed the first phase of a Water Resources Development Act (WRDA) Section 729 Rio Grande Salinity Management Program which included a geospatial salinity database; a USGS Rio Grande Salinity Assessment Study; and Rio Grande Economic Impact Assessment study.

Building on these efforts, in 2010 the Coalition guided a second phase of study designed to evaluate which of six specific locations/sources of salinity to the Río Grande would be most promising for a pilot project. This evaluation, which considered a number of factors including the volume and concentration of the salinity source, the hydrogeologic uncertainty of capture, and treatment costs, identified the southern end of the Mesilla Basin near Sunland Park, New Mexico, as the most promising location for further investigation. In 2013 a conceptual model for this Distal Mesilla Basin location was developed to gain a better understanding of the salinity sources and to identify data gaps that need to be filled to support selection and location of a potential salinity control project. Results of this analysis suggested that two sites associated with the Distal Mesilla source be evaluated for a potential salinity capture project. In 2014-2015, a complete cost benefit analysis was conducted of potential capture projects at these two locations. The results of the Alternatives Analysis for the Distal Mesilla Basin indicate that none of the alternatives evaluated would be economically feasible at this time. However, the study recommended potential options for the consideration by the Coalition and other stakeholders.

For more information on Lower Rio Grande salinity issues, refer to SWQB's webpage at: http://www.nmenv.state.nm.us/swqb/LowerRioGrande/

New Mexico's Wetlands Program

Approximately 1,000,000 acres of wetlands exist in New Mexico, which represents only a portion of the wetlands thought to be in existence in the early 1800's. Historically, the value of wetlands and their functions or natural processes were not fully appreciated and wetlands were used for what were considered more productive uses: agriculture; flood control structures; stockyards and livestock production areas; residential and industrial development; and oil and gas production. As a result, New Mexico has lost a significant portion of its wetlands in the last 200 years.

Wetlands are important features of the natural landscape because they function as filters that trap excess sediment, nutrient runoff and other pollutants, thereby improving water quality. They also mitigate catastrophic weather events common to New Mexico, such as drought and flashfloods, by allowing water to slow down and infiltrate, thus augmenting ground water storage and aquifer recharge. Wetlands support vegetation that provides a moist green fire break in the event of wildfires. They serve as the headwater sources of perennial streams including some of our State's outstanding streams and fisheries. Wildlife benefit greatly from wetlands, which support greater diversity of terrestrial and aquatic species than do cropped or heavily grazed

land. Their presence can also enhance property values in residential areas, as they provide a barrier to noise and urbanization.

Among the modern threats to New Mexico's wetlands are development, ground water pumping that lowers shallow water tables, the use of wetlands for storm water control, gravel and potash mining, invasive exotic plants and animals, agriculture, and channelization. This latter threat has severely impacted many of New Mexico's wetlands by limiting, and in many cases eliminating, the water/land relationship that would normally have allowed the establishment of wetland vegetation and ecosystems along river corridors. Instead, river banks and floodplains are starved of overbank flooding events, natural river shifting and meandering processes are interrupted, materials transport and deposition processes are accelerated, and vegetation communities are altered. The results include the loss of natural flood attenuation, nutrient cycling, habitat connectivity, particulate retention, carbon sequestration, dynamic and long-term surface water storage, moderation of ground water flow or discharge, and maintenance of vertebrate and invertebrate communities and habitat structure. Channelization can also result in severe bank erosion and gully formation causing sediment build up in rivers and reservoirs and the loss of habitat for native fisheries, waterfowl, and other wildlife.

Starbuck Playa in 2015 (Curry County)

Southern High Plain Playas

Another area of concern relating to the condition of wetland areas is New Mexico's playas. 20.6.4.7(P)(1) NMAC defines playa as "a shallow closed basin lake typically found in the high plains and deserts." Playas are a unique class of wetlands because they are typically non-perennial, meaning they are only inundated during growing seasons with adequate precipitation. Each playa exists in its own unique watershed with the playa situated at the lowest (receiving) point. They receive water from precipitation and runoff, and lose water through evaporation, transpiration, and recharge to groundwater (Smith 2003). Playas vary in size and shape, but are typically circular, shallow (<2 meters), and small (<12 hectares). Similar to other wetland types, playa boundaries are defined by their hydric soils, water holding capacity, and relative dominance of wetland plants over upland plants during the growing season (NRC 1995). Playas are notable hydrologic features in the Southern High Plains of the United States, with a high density occurring - i~~I~~n the southeastern part of New Mexico. Playas are important to this arid region because the high clay content of playa bed soils provides excellent water holding capacity critical for attainment of designated uses such as livestock watering and wildlife habitat. , ~~t~~There are many economically and ecologically valuable playas that serve as critical over-wintering habitat for migratory birds within the North American Central Flyway. These waters provide habitat for the Northern Pintail which is a highest priority waterfowl species according to the North American Waterfowl Management Plan (USFWS 2004). They also provide habitat for 15 priority species of shorebirds listed in the U.S. Shorebird Conservation Plan for the Central Plains/Playa Lakes (Brown et al. 2001). These playas are used by other wildlife such as pronghorn antelope, and for irrigation and livestock watering. They provide recreational opportunities such as hunting and bird-watching. Recent research has also shown that these playas serve as ground water recharge zones (Gurdak and Roe 2009), and so serve to sustain local water sources.

Wetland Program Activities

The SWQB's Wetlands Program administers wetland restoration and program development grants received from the EPA under the CWA Section 104(b)(3). The overall goals of the Wetlands Program are to protect and restore New Mexico's remaining wetlands and riparian areas and to prevent additional wetland losses. The Wetlands Program works to increase self-sustaining and naturally functioning wetlands to historic amounts especially targeting threatened, impacted and scarce wetlands types. The Wetlands Program emphasizes the role of wetlands in prevention and reduction of water quality impairments and providing habitat and life requirements for protected species and other wildlife. The objectives of the Program include:

- Conducting identification of wetland types and baseline assessment throughout New Mexico;
- Implementing and administering wetlands restoration projects;
- Conducting an inventory of wetlands resources through landscape level mapping and classification, and working through a statewide mapping consortium;
- Promoting maintenance of instream flow to support streamside and floodplain wetlands and provide other water quality benefits;
- Promoting agricultural water use management and supporting wetlands as filtration systems for agricultural runoff;
- Promoting land management techniques to restore wetland-supporting beaver habitat;
- Increasing wetland acreage in New Mexico through the restoration and protection of wetland corridors;
- Determining the ecological condition of wetlands in New Mexico through the development and implementation of wetlands rapid assessment method;
- Ensuring adequate protection of closed basin and isolated wetlands at the State level; and
- Participating in wetland/riparian education and outreach for schools and interest groups.

Key Program activities include:

- Implementing the "Wetlands Program Plan for New Mexico" (2015);
- Developing and testing new methods that restore wetlands;
- Helping local watershed groups and communities develop Wetlands Action Plans throughout New Mexico to monitor, restore and protect wetlands, riparian and buffer areas at the local level;
- Implementing the "State of New Mexico Assessment and Monitoring Program Strategy for Wetlands" (2013);
- Collecting and analyzing wetlands data using the New Mexico Rapid Assessment Method (NMRAM), and validating our results using indices of biotic integrity (IBI) for select subclasses of wetlands;
- Continuing to map and classify all wetlands in New Mexico including playas, isolated wetlands, and seeps and springs;
- Continuing to explore the relationship of ground water and surface flows that sustain wetlands; and
- Improving water quality standards that apply to wetlands.

In 2015, EPA accepted the updated Wetlands Program Plan for New Mexico (WPP) as meeting the four required elements for such plans: monitoring and assessment; regulation; voluntary

restoration and protection; and water quality standards for wetlands. New Mexico's was the first accepted WPP in EPA Region 6.

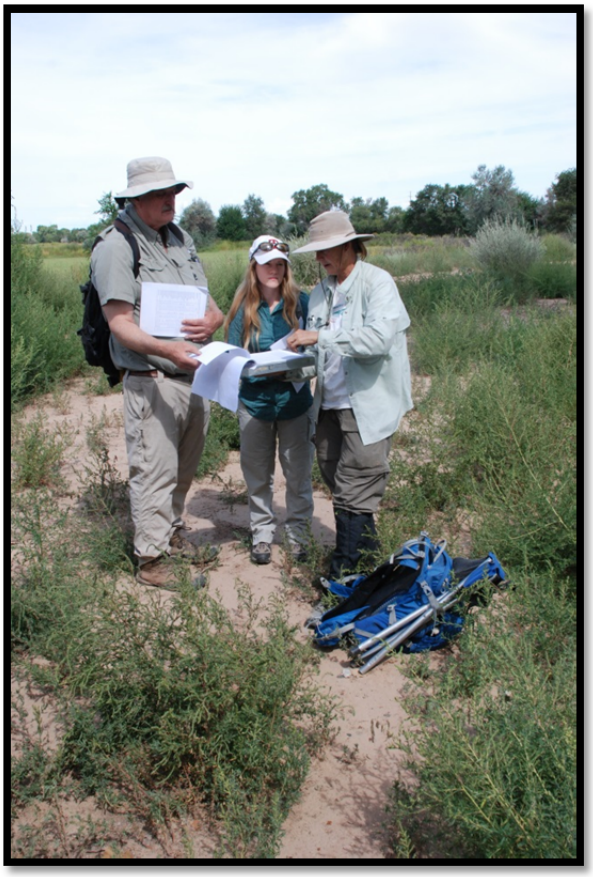
The monitoring and assessment goals of the WPP include expanding our current inventory of wetlands resources across the State. Our landscape level wetlands assessment includes classifying wetlands using the National Wetlands Classification System (Cowardin et al. 1979) and the "Landscape Position, Landform, Waterbody Type, Water Flow Path (LLWW)" (Tiner 2008) classification for updating and inclusion in the National Wetlands Inventory (available at http://www.fws.gov/wetlands/data/mapper.HTML). From these data and other natural resource data, wetland functions and ecosystem services are identified and mapped by wetland type, as well as the identification of subclasses of similar wetlands. Accurate and up-to date mapping of wetlands provides the basis for a greater understanding of wetland resources throughout the State, to monitor changes and trends, identify rare wetland types, select mitigation sites and coordinate protection of wetlands by agencies and partners.

Restored Wetlands in the Cebolla Canyon Closed Basin

In addition to inventory and classification of wetlands, the SWQB Wetlands Program is developing methods for wetlands assessment that lead to protection and provide a benchmark for restoration of the State's wetlands resources. Without assessment information, wetlands resources will continue to decline from over-appropriated surface water allocations, development, flow regulation by dams, mineral extraction, development and urbanization, agricultural nutrients and livestock grazing, major wildfires, non-native invasive species, roads and other stressors. Assessment data from the New Mexico Wetlands Rapid Assessment Method (NMRAM) are providing the basis and justification for development of wetlands water quality standards and designated uses that will enable the State to more comprehensively protect wetlands. NMRAM refines reference standard conditions for each subclass of wetlands, describes the extent and quantity of the targeted wetland type within a reference domain, and identifies the stressors that are causing wetland decline. These data provide justification for preventing or eliminating stressors that will ultimately lead to increases in wetland quality. NMRAM provides for a robust wetlands assessment program in New Mexico and is consistent with the 2013 New Mexico Assessment and Monitoring Program Strategy for Wetlands. Timing wetlands assessment with SWQB's rotating basin schedule ensures the most efficient use of limited resources and integration of wetlands monitoring and results. Training agency personnel, watershed group technicians, and other interested parties in NMRAM will accelerate the collection of relevant data and expand the use of NMRAM to other wetlands in the same selected subclasses.

The development of a New Mexico wetlands database integrated with other water quality data ensures that these data are available to the State, to communities and EPA. These assessment

and monitoring initiatives include collaboration with agencies and non-governmental organizations (NGOs) through advisory committees and the NM Wetlands Roundtables to ensure that the State's overall wetland program develops comprehensively and in a coordinated manner. All of these actions ensure the attainment of quality wetlands and increases in wetlands through improved restoration and protection.



Dr. Esteban Muldavin and Yvonne Chauvin (University of New Mexico Natural Heritage) review datasheets with Alison Kitto (EPA Region 6) for NMRAM data collection on the Rio Grande Floodplain, Valencia County.

Wetlands restoration is a crucial component of the WPP. Several restoration projects are occurring throughout New Mexico which include the assistance and collaboration of a variety of project partners, and are funded by the EPA Region 6 CWA Section 104(b)(3) Program Development grants and the River Stewardship Program. Project activities include restoration of wet meadows and waterfowl habitat, restoration of wetlands on private land parcels, reestablishment of natural flooding, increasing wetland plant diversity and habitat diversity, removal of exotic vegetation, restoration of springs, planning for open-space and conservation easements to protect wetland resources and buffer, restoring high mountain fen wetlands, development and demonstration of slope wetland restoration techniques, and conservation of playas and closed basin wetlands. Other Wetlands Program projects include mapping beaver habitat on federal lands, and studying the potential effects of ground water withdrawal and aquifer recharge on spring-fed wetlands.

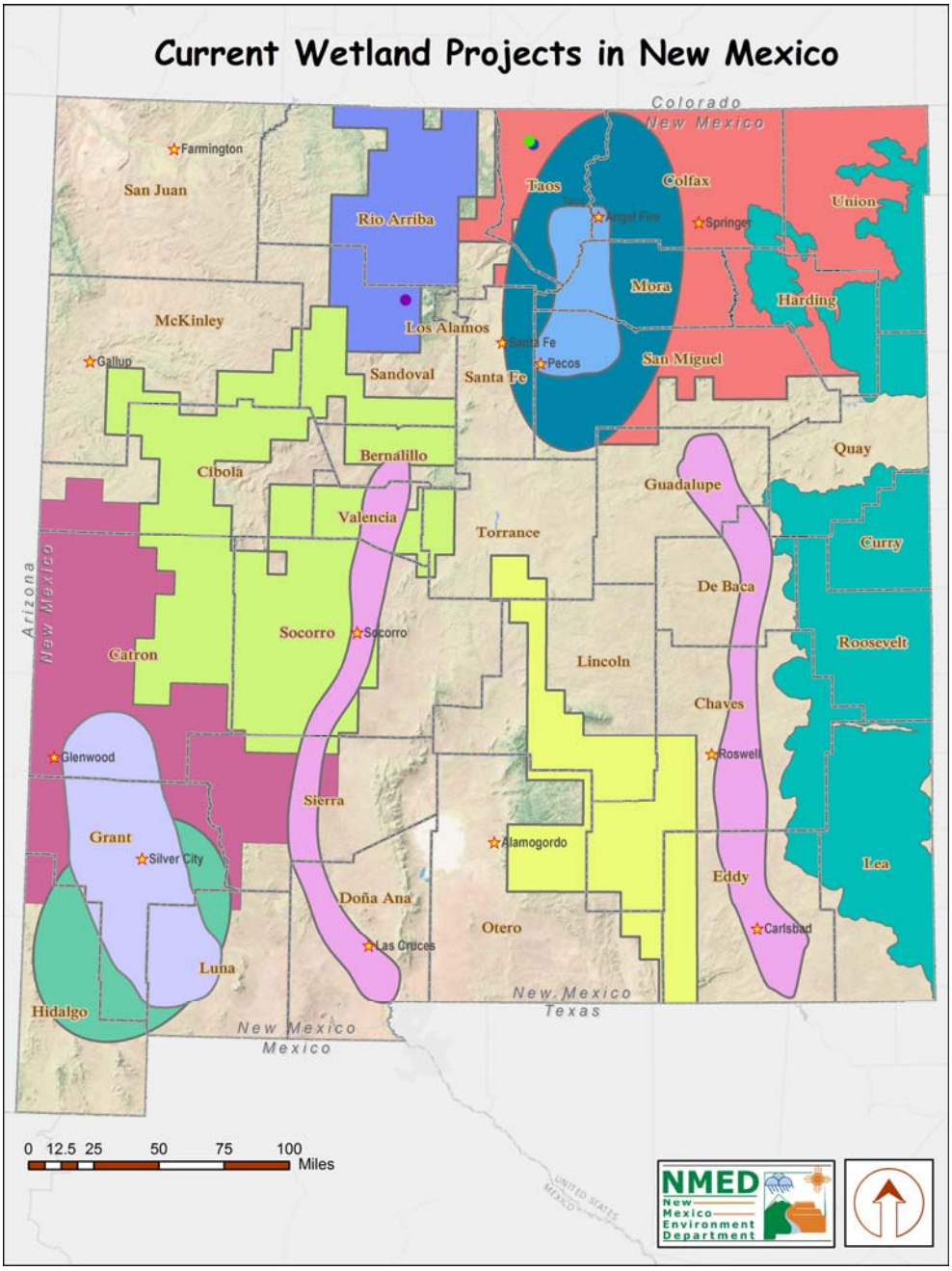
The Wetlands Program coordinates and facilitates the New Mexico Agency Wetlands Roundtable consisting of state, federal, and tribal agency participants, and NGO partners such as the New Mexico Riparian Council, Albuquerque Wildlife Federation and the New Mexico Wildlife Federation. The New Mexico Wetlands Roundtable is conducted four times a year; twice in the spring, and twice in the fall, one each in southern (Las Cruces) and northern (Santa Fe) New Mexico.

Figure 10 and Table 5 depict active wetland projects conducted by the SWQB Wetlands Program in New Mexico. The programs, plans, projects and measures developed and implemented by the SWQB Wetlands Program and our statewide partners, including but not limited to private landowners, permittees, state agencies, and universities, ensure that the biological, chemical, and physical integrity of all New Mexico wetlands are adequately protected.

Table 5. Active Wetland Projects in New Mexico

Project	County
Mapping and Classifiction for Wetlands Protection, Northeastern New Mexico Highlands and Plains	Mora, Colfax, San Miguel, Taos, Rio Arriba, Harding
Rapid Assessment of Riverine Wetlands in the Gila Watershed, SW New Mexico	Grant, Catron
New Mexico Wetlands, From Plan to Action Phase 3	Statewide, San Miguel, Colfax, Grant
Assessing Beaver Habitat on Federal Lands in New Mexico	Statewide Rio Arriba, Santa Fe, Sandoval, Los Alamos
Inventory and Rapid Assessment of Southern New Mexico Springs	Grant, Hidalgo
Mapping and Classification Sacramento Mountain Region	Lincoln, Chaves, Otero
Northeastern New Mexico Mapping and Classification	Mora, Colfax, San Miguel, Taos, Rio Arriba, Harding
Restoring Slope Wetlands	Taos
Assessing Beaver Habitat on Federal Lands, and North Central Map and Class	Statewide Rio Arriba, Santa Fe, Sandoval, Los Alamos
Rapid Assessment Methods for Confined Riverine Wetlands and USACE NMRAM Phase 2	Taos, Rio Arriba, Mora, Colfax
Rapid Assessment Methods Rio Grande, Pecos	Bernalillo, Valencia, Socorro, Sierra, Dona Ana, Guadalupe, deBaca, Chaves, Eddy
Rapid Assessment Methods Playas	Curry, Quay, Harding, Roosevelt, Union, Lea
Mapping and Classification of Wetlands in the Middle Rio Grande Basin	Bernalillo, Sandoval, Socorro, McKinley, Valencia, Catron, Torrence
Keyline Design for Restoration of Headwater Slope Wetlands	Taos

New Mexico's Wetlands Program Plan (2015) entitled State of New Mexico Assessment and Monitoring Strategy for Wetlands" and additional information on New Mexico's Wetlands Program can be found at: https://www.env.nm.gov/swqb/Wetlands/.



Wetlands Projects		County
	Mapping and Classifiction for Wetlands Protection, Northeastern New Mexico Highlands and Plains	Colfax, Harding, Mora, Rio Arriba, San Miguel, Taos
	Rapid Assessment of Riverine Wetlands in the Gila Watershed, SW New Mexico	Catron, Grant
	New Mexico Wetlands, From Plan to Action Phase 3	Colfax, Mora, San Miguel, Taos, Statewide
	Assessing Beaver Habitat on Federal Lands in New Mexico	Los Alamos, Rio Arriba, Sandoval, Statewide
	Innovative Design and Restoration of Slope Wetlands in the Comanche Watershed, New Mexico	Taos
	Innovative Restoration of Historic Wetlands Along Sulphur Creek, Valles Caldera National Preserve	Sandoval
	Rapid Assessment for New Mexico's Playa Region, Southern High Plains	Curry, Harding, Lea, Quay, Roosevelt, Union
	NMRAM for Lowland Riverine Wetlands, Rio Grande/Lower Pecos and Regulatory Module for USACE	Bernalillo, Chaves, De Baca, Doña Ana, Eddy, Guadalupe, Socorro, Sierra, Valencia
	NM Rapid Assessment Method for the Canadian, and Developing Designated Uses for Montane Riverine Wetlands	Colfax, Mora, Rio Arriba, San Miguel, Taos
	Inventory and Rapid Assessment of Southern New Mexico Springs	Grant, Hidalgo, Luna
	Mapping and Classification for Wetlands Protection, Sacramento Mountains Region, New Mexico	Chaves, Eddy, Lincoln, Otero, Torrance
	Mapping and Classification of Wetlands in the Middle Rio Grande Basin	Bernalillo, Catron, Cibola, McKinley, Sandoval, Socorro, Torrance, Valencia
	Keyline Design for Restoration of Headwater Slope Wetlands in the Holman Creek Wetlands Complex	Taos
	Mapping and Classification of Wetlands, Southwestern New Mexico	Catron, Cibola, Grant, Luna, Sierra

Figure 10. Current Wetland Projects in New Mexico

Drinking Water Program

NMED's Drinking Water Bureau (DWB) is responsible for preserving, protecting, and improving New Mexico's drinking water quality for present and future generations. This is accomplished by implementing the requirements of New Mexico's Drinking Water Regulations (20.7.10 NMAC) and the federal Safe Drinking Water Act (SDWA) which establish the standards for drinking water throughout the State. These standards set limits for harmful contaminants such as pesticides, volatile organics, and radiochemical, chemical, and bacteriological contaminants.

The SDWA originally focused on treatment as the means of providing safe drinking water at the tap. The 1996 amendments greatly enhanced the existing law by recognizing source water protection, operator training, funding for water system improvements, and public information as important components of safe drinking water. This approach, adopted by the DWB, ensures the quality of drinking water in New Mexico by protecting it from source to tap. See inset box for additional information on recent primacy activities.

NEW MEXICO TO IMPLEMENT REVISED TOTAL COLIFORM RULE in 2016

The Drinking Water Bureau submitted a primacy package to the EPA for the Revised Total Coliform Rule (RTCR) 78 FR 10269, February 13, 2013, Vol. 78, No. 30.

The purpose of the RTCR is to increase public health protection through the reduction of potential pathways of entry for fecal contamination into public water system (PWS) distribution systems.

The RTCR establishes a maximum contaminant level (MCL) for *E. coli* and uses *E. coli* and total coliforms to initiate a "find and fix" approach to address fecal contamination that could enter into the distribution system. It requires PWSs to perform assessments to identify sanitary defects and subsequently take action to correct them. The anticipated implementation date of the RTCR in NM is April 2016. Additional Information is available at: http://www.epa.gov/dwreginfo/revised-total-coliform-rule-and-total-coliform-rule

All public water systems must monitor the water for regulated contaminants and ensure compliance with New Mexico's Drinking Water Regulations and the SDWA. Water samples are collected at each public water system after treatment, and analyzed for contaminants according to an established schedule. The DWB provides oversight to all of New Mexico's public water systems and reviews these data, periodically inspects the system according to a rotating schedule depending on the type of system, and takes action whenever a system is out of compliance. These actions typically include providing technical, managerial or financial assistance to help improve the overall capacity of a system and encouraging systems to regionalize and combine resources when possible; however, enforcement action may be taken to return the system to compliance. In addition to providing oversight to systems, DWB's Source Water and Wellhead Protection Program staff works with systems to identify potential sources of contamination that might have adverse effects on the source waters and to develop a plan to protect those drinking water sources.

As drinking water standards become increasingly more stringent, ground water that can meet regulatory requirements with little or no treatment becomes less available. During recent years, many ground water systems have had particular difficulty complying with new arsenic and uranium maximum contaminant levels (MCLs). While ground water continues to be the source for the majority of public water systems in the state, many systems, including Albuquerque and

Santa Fe, are considering or have already added surface water as a significant source of drinking water.

Systems utilizing surface water sources require more sampling of treated water than systems using a ground water source due to the potential for rapid changes in source water quality. While the quality of the source water does not impact the required quality of the produced drinking water, the quality of the source water will influence treatment considerations and associated costs.

As of September 2015, out of 1,100 public water systems, approximately 60 public water systems use or purchase water obtained from either surface water or ground water under the direct influence (GWUDI) of surface water. When chlorine is used as part of surface water treatment, disinfection byproducts can form when organic carbon reacts with the chlorine. Typically, systems can adjust treatment and operation return to compliance relative quickly; however, additional infrastructure is sometimes required to remove organic carbon. A system is required to notify the public whenever violations of the SDWA occur.

The DWB's Source Water and Wellhead Protection Program works with public water systems to protect surface water sources as well as ground water sources. The DWB assists systems to conduct assessments of surface water sources' vulnerability to contamination for all public water systems utilizing surface water sources. The Source Water and Wellhead Protection Program recommends that systems evaluate surface water sources on the following criteria: 1) stream flow rate or reservoir size; 2) surface water intake construction and integrity; 3) intake method (direct or indirect); and 4) average daily turbidity of the surface water source. Sources of contamination are also typically identified within a ten-mile segment upstream of each intake, to a distance of one half mile on either side of the source. The identified sources of contamination are evaluated based on the chemical properties of the associated contaminants, their likelihood of release, the number of contaminants, their proximities to the surface water source, and chemical monitoring history.

Recognizing the need to protect public health and provide safe drinking water, the DWB and New Mexico Finance Authority administer the Drinking Water State Revolving Loan Fund (DWSRLF), which provides low-cost loans to eligible water systems. In state FY2015 DWSRLF funded nine projects totaling $9,460,937. Representative projects include repair and replacement of failing distribution lines, water treatment upgrades to maintain compliance with the SDWA, and the construction and rehabilitation of wells to ensure an adequate water supply.

Additional information on NMED's Drinking Water Bureau is available at: https://www.env.nm.gov/dwb/index.htm.

New Mexico Department of Health

The New Mexico Department of Health (NMDOH) plays a vital role by examining the contaminants in drinking water supplies that can cause adverse health effects, primarily excess nitrate and biological contamination. Nitrate above the MCL can cause methemoglobinemia (also known as "blue baby syndrome") which occurs when the ingested nitrate interferes with the ability for blood to carry oxygen to body tissues. A NMDOH analysis of the New Mexico Safe Drinking Water Information System indicated that, for 2012-2013, four (12%) of the 33 counties in New Mexico had one or more public water systems that violated the MCL for nitrate (NM SDWIS 2014). There were no reported cases of methemoglobinemia from 2002 through 2013. Infant methemoglobinemia and other suspected environmentally-induced health conditions were added to the notifiable diseases or conditions list in 2006, thus enhancing surveillance efforts. The current list of notifiable conditions for the NMDOH can be found at: http://nmhealth.org/publication/view/regulation/372/.

Biological contamination of drinking water systems is monitored by routinely checking for total coliforms. The presence of total coliforms in drinking water could indicate the presence of fecal coliforms, or *E. coli*, one of the fecal coliform organisms. Fecal coliforms are organisms that are present in intestinal systems of all warm-blooded animals. Most are not dangerous to humans, but some may cause adverse health effects such as vomiting and diarrhea. Additionally, fecal contamination may indicate the presence of other disease-causing organisms (e.g., bacteria, parasites, and viruses). Enterohemorrhagic *E. coli* was first identified in 1982 and became a nationally reportable disease in 1993. The most commonly reported serotype is *E. coli* O157:H7. This type of *E. coli* produces a Shiga toxin that can cause severe damage to the lining of the intestine, and complications can result in serious kidney damage (Hemolytic Uremic Syndrome). Infection with this organism is most commonly associated with the ingestion of undercooked beef and other foods contaminated by cattle feces. However, waterborne transmission has also been documented.

The NMDOH monitors reported diseases and organisms that are potentially water-related in an effort to help ensure the safety of New Mexico's public drinking water. These diseases and organisms include Camplyobacteriosis, Cryptosporidiosis, *E.coli*, Giardiasis, Hepatitis A, Salmonellosis, and Shigellosis. These diseases and organisms can also be transmitted through food or person-to-person contact. There were 1957 cases (probable and confirmed) of infectious diseases reported to the New Mexico Electronic Disease Surveillance System (NM-EDSS) that could be carried via water in 2012-2013 (NMDOH Weekly Infectious Disease Report, 2014). However, none of these cases were confirmed as being associated with a contaminated drinking water source, despite "boil water" advisories being administered in about twenty New Mexico counties during 2012-2013. When a boil water advisory is issued by NMED, the NMDOH provides educational materials for the public and advises district public health officials to be on alert for cases of gastrointestinal illness. New Mexico remains vigilant for any potential incidents, paying particular attention to water systems with a history of problems meeting federal drinking water quality standards.

For more information water related public health concerns, refer to the NMDOH's water quality webpage at https://nmtracking.org/en/environ_exposure/water-qual/ and https://nmtracking.org/en/environ_exposure/water-qual/.

Fish Consumption Advisory Program

Fish are a lean, low-calorie source of protein, and can be an important part of a balanced diet. However, some fish may contain contaminants that, when consumed in certain quantities, could pose health risks. When contaminant levels may be unsafe, consumption advisories recommend that people limit or avoid eating certain species of fish caught in certain places. NMDOH, New Mexico Department of Game and Fish (NMDGF), and NMED work together to implement New Mexico's Fish Consumption Advisory Program. EPA considers fish or shellfish consumption advisories and supporting fish tissue data to be existing and readily available data that demonstrate non-attainment of CWA goals stating that waters should be "fishable" (CWA Section 101(a), EPA 2005). The basis for fish consumption impairments each listing cycle is the most recent, available fish consumption advisories at the time the Integrated Report is drafted.

Electrofishing in a New Mexico River

The Program's monitoring strategy involves screening a select number of sites for chemical contamination where sport, subsistence, or commercial fishing is conducted. Site selection is prioritized based on areas where it is known that a large number of fish are harvested or where there are known or suspected contamination issues. This screening helps identify those waters where fish tissue contamination may pose unacceptable health risks to human consumers.

Fish consumption advisories relay fish tissue contamination information to the public. These advisories are only guidelines and do not constitute legal restrictions that prevent people from eating contaminated fish from New Mexico lakes and streams. Fish consumption advisories pertain to consumption of fish only. There are no known contaminant-related health risks associated with activities such as camping, swimming, boating, or handling fish in area where there are fish consumption advisories.

Currently, advisories have been issued for mercury, DDT and PCBs in fish tissue at several reservoirs, lakes and rivers (NMDOH *et al*., 2015). In 2006, as a result of the fish tissue contaminant data analysis from Brantley Reservoir, the New Mexico Game Commission restricted fishing in Brantley Reservoir and the Pecos River in the Brantley Wildlife Management Area to "catch and release" only.

All New Mexico fish consumption advisories are available online at:
http://www.nmenv.state.nm.us/swqb/advisories/

Other NMED Programs Addressing Surface Water Concerns

The WQA governs most of the programs that address water pollution control in New Mexico. However, because surface water quality is affected in so many diverse ways by so many different activities, NMED has numerous other programs that deal with water quality protection, including:

- Clean Water State Revolving Fund (CWSRF) Program (see Section B.3 for details);

- Department of Energy (DOE) Environmental Oversight and Monitoring Program implemented by the NMED DOE Oversight Bureau;
- Drinking Water State Revolving Loan Fund (DWSRLF);
- Ground Water Management Program (see Part D below for details);
- Hazardous Waste Management, Petroleum Storage Tank and Solid Waste Management programs of the federal Resource Conservation and Recovery Act (RCRA); and
- Underground Injection Control and Public Water Supply Programs of the Safe Drinking Water Act (SDWA) (see Section C.7 below for details).

Coordination with Other State, Tribal and Local Government Agencies

Successful surface water quality management and protection is founded on cooperative interaction between the federal, state, local, and tribal levels of government, and between the public and private sectors. In addition to NMED, numerous other New Mexico and federal agencies conduct activities that impact surface water quality, including but not limited to:

- NM Office of the State Engineer (OSE);
- NM Interstate Stream Commission (ISC);
- NM Department of Game and Fish (NMDGF);
- NM Department of Agriculture;
- NM Energy, Minerals, and Natural Resources Department (EMNRD);
- NM Oil Conservation Commission;
- US Army Corps of Engineers (USACE);
- US Bureau of Reclamation (USBOR);
- US Forest Service (USFS);
- Natural Resources Conservation Service (NRCS); and
- Soil and Water Conservation Districts (SWCDs).

What is a Stakeholder?
For the purposes of this report, stakeholder is defined as any organization, governmental entity, or individual that has a vested interest in or may be impacted by a state directed approach to environmental regulation, pollution prevention, or energy conservation.

These and other agencies work with stakeholders during development and implementation of water quality management activities. Coordination is crucial and focuses on informing and including stakeholders on water quality management related activities, seeking input, soliciting data and information, and working with stakeholders to implement solutions to water quality problems and concerns. Additionally, numerous stakeholder focus groups have been developed for specific issues and meet on a regular basis to coordinate efforts. NMED participates in many of these groups to address a variety of water quality issues. Examples of such groups include the New Mexico Municipal League, Environmental Quality Association, the New Mexico Forest and Watershed Health Coordinating Group, and individual watershed groups' regular meetings, such as the Middle Rio Grande Water Quality Workgroup.

Recognizing the overabundance of funding needs and limited resources in New Mexico, NMED developed the Water Infrastructure Team (WIT) in 2014. The WIT is a collaborative effort of government agencies and non-governmental organizations who are working together to tackle New Mexico's vast water infrastructure needs (including wastewater and drinking water). This multi-state agency effort includes the identification of water system funding as well as technical, managerial, and financial assistance needs. Through a survey conducted in 2014, the WIT identified over $300 million of water-related infrastructure projects in need of funding and continues to work with stakeholders to help identify potential funding sources for these projects.

Additional information regarding WIT is available online at: https://www.env.nm.gov/WIT/.

B.3 Resource Assessment of New Mexico's Surface Water Quality Management Programs

Protecting and preserving water quality to ensure adequate, safe, and reliable water resources for the long term is a top priority for New Mexico. Each year New Mexico makes significant investments in water quality management programs and water quality improvements. These investments are an expression of the value placed on New Mexico's precious water resources. The quality of the State's water resources has an impact on every citizen and is linked to the economic vitality and quality of life New Mexicans cherish.

Like most states, New Mexico is faced with the challenge of addressing an array of complex surface water quality issues with limited financial resources. As federal and state funding to address water quality issues becomes even more limited, and as the complexity of environmental needs continues to increase, there is an expectation that NMED will continue to meet the mandates of state and federal legislative and regulatory requirements with fewer resources to do so. This pressure makes it essential that New Mexico evaluate information regarding the fiscal implications and potential benefits of its water quality programs. While most are implemented by NMED, they are largely funded by the federal government. However, and as referenced throughout this report, there are also significant local, state, and even private resources that directly or indirectly affect the State's water quality.

Resources Applied to Surface Water Quality Management

Water quality management programs enable New Mexico to better understand the quality of our waters, identify water quality problems, implement measures to address those problems, and improve water quality in a systematic, organized, and economically efficient manner. Table 6 summarizes the estimated amount of funds expended annually to implement NMED's comprehensive water quality management program, and is based on actual expenditures for state FY2015. Match of state or federal funding, provided locally as in-kind support for nonpoint source and wetland projects, are not included in this table.

Table 6. Estimated State FY2015 Expenditures on New Mexico's Surface Water Quality Management Implemented Through NMED SWQB

Water Quality Management Program	Federal	State	Total
Monitoring & Assessment Section (Includes TMDL Development, Water Quality Management Program & State Fish Advisories,)	$791,694	$280,383	$1,072,077
Point Source Regulation Section (includes NPDES and Utility Operators Certification Program)	$749,319	$311,224	$1,060,543
Nonpoint Source Management Section*	$1,049,013	$130,144	$1,179,157
Wetlands Program*	$456,738	$81,873	$538,611
Water Quality Standards Program (includes planning and reporting activities)	$180,081	$51,845	$231,926
River Stewardship Program**	--	$291,843	$291,843
Total	**$3,226,845**	**$1,147,312**	**$4,374,157**

NOTES: The above numbers are based on NMED state FY2015 actual expenditures.
* = The grant programs under which these federal funds were allocated require a 40% non-federal match, which is not included in this analysis
* * = These projects are state-funded special initiatives whose continued funding is uncertain.

Capital Investments in Municipal Facilities

The estimated annual costs for operating and maintaining various sizes of wastewater treatment facilities in New Mexico is summarized in Table 7. Most of these operation and maintenance costs are funded through fees included in monthly water/sewer rates. Many entities do not include replacement cost in their rate structure; therefore, New Mexico is encouraging communities to utilize the Asset Management approach to rate setting. Asset Management helps wastewater treatment systems prepare for both anticipated and unexpected problems by evaluating the system's current physical, financial, and managerial situation. It requires entities to make fundamental

Table 7. Estimated Annual Operation and Maintenance Costs for Wastewater Treatment Facilities in New Mexico

Wastewater Treatment Plant Facility Size	Estimated Annual Operation and Maintenance Costs
Small WWTP < 1 MGD	$300,000 per year
Med WWTP 1-4 MGD	$780,000 per year
Large WWTP > 5 MGD	$1,500,000 per year

Source: Utility Operator Certification Program

decisions about the water system's purpose, structure, and functions. For more information refer to *Asset Management: A Handbook for Small Water Systems* (EPA 2003a).

To address funding of construction and improvement for treatment facilities owned by municipalities, New Mexico has established a comprehensive program to provide funds through both loan and grant mechanisms to local governments. The program is administered through the NMED Construction Programs Bureau (CPB), and is responsible for managing the timely construction and administrative completion of publicly funded water, wastewater, and solid waste projects. In addition, the CPB ensures that projects are environmentally sound, of high quality, and free of waste, fraud, and abuse. Investments in infrastructure to improve the quality of waste streams are a critical component of the State's water quality management program. Table 8 summarizes the programs and shows the amounts distributed in state FY2014 and FY2015.

Table 8. Summary of Improvement and Construction Costs for New Mexico Water, Wastewater, and Solid Waste Facilities

Program	Description	Funds Disbursed in FY 2014	Funds Disbursed in FY 2015
State Appropriations Program	State Legislature capital outlay appropriated for the construction of community water supply, wastewater facility, and solid waste facility projects.	$8,591,497	$8,956,226
Clean Water State Revolving Fund (CWSRF) Program	Revolving loan fund to provide a source of low-cost financing for a wide range of wastewater or storm drainage projects that protect surface and ground water quality and public health. Funds may also be used for nonpoint source water pollution control projects, such as solid waste projects and septic tank installations	$7,379,685	$22,764,691
Rural Infrastructure Program	Revolving loan fund to provide financial assistance to local authorities for the planning, design, and construction or modification of water supply, wastewater, and solid waste facilities.	$3,185,458	$108,845
	Water Related Projects TOTAL	**$19,156,640**	**$31,829,762**

Benefits of these expenditures can be seen in direct and indirect improvements in the quality of life in New Mexico communities. The state's water quality programs, including expenditures for pollutant-reducing infrastructure, result in prevention of water quality degradation from point and NPS sources of pollution, protection of aquatic life and habitat in receiving streams, reduction of pollutant loads that could have financial and public health impacts in areas where surface water is a source of drinking water, increased public awareness regarding the need for water quality protection, and sustainable resource management practices.

For more information on water and wastewater construction programs, refer to the Construction Programs Bureau webpage at https://www.env.nm.gov/cpb/cpbtop.html.

Clean Water State Revolving Fund Program

Through the CWSRF program, NMED maintains a revolving loan fund to provide a source of low-cost financing for a wide range of wastewater and storm drainage projects that protect surface and ground water. Funds may also be used for projects that control NPS water pollution, such as those associated with landfills and septic tank installations.

The CWSRF program was established in 1986 pursuant to the Wastewater Facility Construction Loan Act and the CWA, and provides very attractive low-interest loans that spread project costs over a repayment period of up to thirty years. Repayments are cycled back into the Fund and used to pay for additional clean water projects.

EPA capitalization funds that have been appropriated to New Mexico since state FY2010 have allowed NMED to subsidize CWSRF loans on a small scale. This subsidy, combined with the low interest rates, has enabled NMED to sign funding agreements for infrastructure improvements totaling $29,336,364 in state FY 2014 and $26,815,861 in state FY2015.

B.4 Significant Surface Water Issues

Agencies and other stakeholders that implement New Mexico's water management programs work continuously to protect surface water quality. However, there are still many challenges in meeting the objectives of the CWA and the WQA that remain. Below is a list of the more significant surface water issues in New Mexico.

Gold King Mine Spill

On August 5, 2015 at approximately 10:30 am MDT, an estimated 3 million gallons of contaminated mine wastewater was released from the Gold King Mine (GKM) in the headwaters of Animas River near Silverton, CO. The wastewater (near the spill site) was estimated to carry at least 200 times more arsenic and 3,500 times more lead than is considered safe for drinking. The plume entered New Mexico on August 7, 2015 and flowed into the San Juan River on August 8, 2015. Drinking water intake systems and most irrigation head gates along the Animas River in New Mexico were shut down while the contaminated plume traveled past.

The GKM was operated from approximately 1887 until 1922 and is only one of more than 400 abandoned or inactive mines (a.k.a. "legacy mines") in the San Juan Mountains. These legacy mines have billions of tons of heavy metal-laden waste, such as arsenic, copper, lead, and mercury, which have not been remediated or cleaned up. While the scope of the 2015 GKM spill has put the spotlight on legacy mining impacts, there have been several high profile spills in the past, including another large magnitude blowout into Eureka Gulch and the Animas River in 1978, and a breach in the 1980s at the Leadville Tunnel in Colorado that killed off the aquatic life in the headwaters of the Arkansas River, to highlight a few.

NMED's SWQB staff arrived on site to collect surface water quality data from three stations on the Animas and San Juan rivers prior to the arrival of the GKM spill plume. Sampling started on August 7, 2015 at 4:40 pm and continued every six hours until the final water quality sample was collected on August 14, 2015 at 8:30 am. On August 15, 2015, bans and precautions were lifted for use of nearby floodplain level wells, drawing canal or river water, irrigating crops, use of San Juan County's drinking water systems' supply connection, and recreational use.

The following metals are of concern with regard to acid rock and mine drainage and to the GKM spill: arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, and zinc. During SWQB's sampling period, while metals were detected in elevated concentrations, both dissolved and total metals concentrations in the Animas and San Juan rivers were found to be below surface water quality standards, indicating support of all designated uses, including aquatic life and irrigation. Specifically, SWQB's surface water sampling results indicate dissolved (D) and total (T) metals in detectable quantities for aluminum (D and T), copper (T), lead (D and T), manganese (D and T), molybdenum (D and T), and zinc (T); all other metal analytes were not detected in any SWQB surface water quality samples.

The long-term impacts of the GKM spill are unknown; however, metal-laden sediments will continue to be transported downstream during flood events or other high-water events such as snowmelt for the foreseeable future. Long-term concerns are the sludge's effect on human health through recreational (kayaking and fishing) or residential (well water and irrigation) exposure, its impact on wildlife communities (e.g. fish, livestock, macroinvertebrates) that depend on this water, and pollutant accumulation or magnification in local food webs. Monitoring efforts should focus on drinking water systems, surface water quality, sediment contamination,

ground water-surface water interactions, ground water quality, and biomonitoring (e.g. fish tissue, macroinvertebrates, birds).

More information on the Department's GKM response efforts, long-term monitoring plan, current advisories, timelines, and news releases is available at: https://www.env.nm.gov/riverwatersafety/.

New Mexico Water Infrastructure Team

New Mexico has vast water infrastructure needs estimated at $1 billion. Each year the New Mexico Legislature allocates a portion of the severance tax bond capacity towards infrastructure funding in the state. Last year, the Legislature approved over $12.5 million for water and wastewater infrastructure to be administered by the NMED. The New Mexico Water Infrastructure Team (WIT) is a collaborative effort of government agencies and non-governmental organizations working together to tackle New Mexico's vast water infrastructure. The WIT identifies qualified projects and matches them to funding sources. The ultimate goal is to match as many projects as possible with available and appropriate funding sources that are the best fit for our communities, both large and small.

The WIT also shares free resources to help bring awareness to the importance of water infrastructure in our daily lives through a five series set of materials. Handouts and flyers are available for anyone to print, hang, distribute, or post online as best works for them and their communities. Materials will be updated every other month starting January 15, 2016. For more information please visit the NMED's Water Infrastructure Team webpage at: https://www.env.nm.gov/WIT/.

Wildfires

New Mexico has experienced a growing number of wildfires with increasing size and severity. Wildfires can produce significant watershed changes that may impact water quality, fish and other aquatic organisms, drinking water supplies and wastewater treatment systems. The primary water quality concerns after a wildfire are: (1) the introduction of sediment and debris into the surface waters; (2) the increase of nitrate and other plant nutrients from burned vegetation; (3) the introduction of radionuclides and heavy metals from ash, soils, and geologic sources; and (4) the introduction of fire retardant chemicals into waterbodies. The magnitude of these effects is largely dependent on the size, intensity, and severity of the fire, and on the condition (e.g., healthy or poor) of the watershed at the time of burning.

A watershed may take decades to completely recover from the effects of a wildfire, during which time the waters may exceed water quality standards for one or more pollutants. Assessing the water quality of an area after a wildfire can be challenging as it may be difficult to determine the cause of any impairments and when the fire-caused conditions are no longer influencing the watershed. Whether natural or human-caused, with the increasing frequency and magnitude of wildfires in response to drought and climate change, a standard approach for monitoring, assessing, and listing wildfire affected areas needs to be developed.

Pending Triennial Review of Water Quality Standards

In April and May of 2014, the SWQB sought public review and comment on draft changes to the surface water quality standards (20.6.4 NMAC). SWQB received input from the EPA, watershed/river conservation groups, municipalities, water districts, industrial/trade groups, private organizations and citizens. All timely comments received and SWQB responses were compiled as part of the public record. Throughout the Triennial Review process, SWQB met

and worked with groups when it was requested to discuss their concerns. As a result, there were significant changes to SWQB proposals in Sections 20.6.4.10 NMAC (Temporary Standards) and 20.6.4.16 NMAC (Planned Used of a Piscicide).

The SWQB presented the Triennial Review proposals to the Water Quality Control Commission (WQCC) in public hearings held October 13-16, 2015. Approval of proposals by the WQCC is pending and the earliest date for a decision is anticipated in March 2016. Once approved by the WQCC, these changes will be submitted to EPA for their approval under CWA Section 303(c). Revisions to the WQS under consideration include:

- A new temporary standards provision in 20.6.4.10 NMAC;
- Segment-specific standards for appropriate aquatic life protections in the Mimbres and San Juan River basins;
- Updates to the piscicide provision in 20.6.4.16 NMAC for applications under the EPA permit program and for public input or hearing requests when applications are not covered under an EPA permit;
- Primary contact uses and criteria updates for nine segments based on CWA requirements and the most recent EPA recommendations;
- Listing of ephemeral waters under Section 20.6.4.97 NMAC pursuant to 20.6.4.15.C NMAC; and
- Clarifications of criteria applicability, updates to methods and corrections of grammatical errors.

Additional information about New Mexico's surface water quality standards and the Triennial Review is available on SWQB's website: https://www.env.nm.gov/swqb/Standards/.

Nutrient Reduction Strategy

The EPA, through its National Water Program Guidance, continues to place a high priority on states addressing nutrient pollution and identifying nutrient-impaired waters through adoption of numeric water quality criteria for nitrogen and phosphorous in our nation's waters, although it has allowed appropriate flexibility to states to make incremental improvements to address excess nutrients through other measures (Stoner 2011). As documented in the *New Mexico Nutrient Reduction Strategy* (NMED/SWQB 2014), New Mexico is currently not pursuing adoption of numeric nutrient criteria. Instead, New Mexico is pursuing the continued improvement of our narrative criteria assessment protocols. Specific accomplishments this listing cycle include:

- Completion of a collaborative EPA's Nutrient Scientific Technical Exchange Partnership and Support (N-STEPS) project to refine numeric nutrient threshold values for wadeable, perennial streams using reference conditions and stressor-response relationships in verified classification systems (for additional details, see the highlight box in Section C.2);
- Continued protection of water-quality limited segments according to New Mexico's Antidegradation Policy through the CWA Section 401 state certification process to ensure that Tier 1 (i.e., waters identified as "impaired") waters are not further degraded by conditioning nutrient limitations that, at a minimum, protect existing instream uses;
- Continued improvements to nutrient TMDLs that recognize the nutrient threshold concentrations necessary to protect designated aquatic life uses while developing

approaches to implement waste load allocations that are technologically achievable while neither over- nor under-protective; and

- Proposed adoption of a Temporary Standard provision during the 2013 Triennial Review process to enable the setting of scientifically-based, environmentally sound permit limits that consider the existing facility design, facility age and local economic factors.

Adequate Funding of Water Quality Programs

State and federal funding for water quality programs has decreased to a point where some basic services can no longer be sustained. The most recent and significant impact has been from the 10% federal rescission that impact funds provided to New Mexico under Section 106 of the CWA. Even funding cuts in other agencies that are often thought of a peripheral to water quality management have an adverse effect on water quality programs. For example, budget cuts in the New Mexico Department of Health have resulted in a 45% reduction in analytical services provided by the State Laboratory Division to NMED. Other areas where budget cuts or flat funding levels that have not kept up with inflation have reduced water quality services include ambient water quality monitoring and assessment (especially for lakes), ground water quality protection permits, field inspections, and watershed project implementation. In addition, as the Southwest continues to experience drought conditions, water quality management programs become all the more important. Elected officials, land managers, and other stakeholders have higher expectations of water quality agencies. These pressures run contrary to the funding profiles these agencies are experiencing.

PART C - SURFACE WATER MONITORING AND ASSESSMENT

C.1 Statewide Water Quality Monitoring

Monitoring Goals and Objectives

The purpose of SWQB's Monitoring Program is to ensure relevant water quality data for all of New Mexico's surface waters are collected and assessed with the most robust scientific methods in a way that is transparent to water quality agencies and the public.

Clear goals and objectives are required to implement an effective monitoring program. To meet federal (EPA 2003b) and state requirements and expectations, the goal of the Program is to answer five questions:

1. What is the overall quality of waters?
2. To what extent is water quality changing over time?
3. What are the problem areas, and which of those areas need protection?
4. What level of protection is needed?
5. How effective are CWA projects and programs?

The first step in developing a monitoring strategy to achieve the stated goals is defining a clear set of water quality data objectives. These objectives must be met to address the five questions identified above, and can be placed into the following broad monitoring categories:

- Determination of designated use attainment;
- Status and trend monitoring;
- Monitoring for TMDL development;
- Monitoring for standards refinement;
- Effectiveness monitoring and NPDES compliance monitoring; and
- Wetlands monitoring.

A detailed discussion of these objectives is provided in SWQB's Monitoring and Assessment Strategy (NMED/SWQB 2010).

Monitoring Design

The Monitoring Program integrates targeted and fixed-station sampling designs to address the goals and the monitoring objectives. This creates the most efficient combination of monitoring designs, given current funding, while still meeting the required objectives.

Like several states, New Mexico utilizes a targeted, rotational watershed approach to ambient water quality monitoring. This integrative watershed approach enhances program efficiency by providing:

- A systematic, detailed review of water quality data;
- More efficient use of human and budget resources;
- Information on a scale where implementation of corrective actions is feasible; and
- An established order of rotation and predicted sampling year for each watershed, which allows easier coordination efforts with other programs and other entities interested in water quality.

Water Quality Sampling for basic field parameters

Watershed surveys are developed through establishment of targeted sampling sites throughout a watershed of interest. Program personnel serve as survey leads and co-leads, and ensure all necessary chemical, biological, and physical data are collected during the survey year. Pre- and post-survey planning meetings are held with other SWQB personnel working on point source and nonpoint source issues and TMDL development in the watershed. The SWQB strives to establish at least one sampling station in each assessment unit (i.e., identified stream reach or lakes/reservoir on the Integrated List). Exact sample site location, sampling frequency, and type of data collected are established so as to allow determination of attainment of New Mexico surface water quality standards. This information is detailed in the *Quality Assurance Project Plan for Water Quality Management Programs* (QAPP) and standard operating procedures (NMED/SWQB 2013, 2015a), and is an adaptive, on-going management approach; watersheds will not be ignored between survey years. The current 8-year rotational monitoring schedule is shown in Figure 11. For survey years 2015-2016, SWQB is conducting a two-year survey covering the entire northwest portion of the state. The pros and cons of implementing two-year surveys are being weighed to determine the best path forward.

Because New Mexico is a large state with relatively little perennial water compared to total land area, and given the level of and recent trends in financial and staff resources, SWQB considers the targeted approach to be the most appropriate to meet New Mexico's monitoring objectives. SWQB has sampled nearly all of New Mexico's perennial waters during its watershed surveys. Approximately 82% of all identified stream miles have been assessed and 77% of public lake acres have been assessed to date, including all of New Mexico's large mainstem reservoirs. The targeted approach has proven effective at fulfilling monitoring objectives and allowing for general conclusions to be drawn about the status of the State's waters.

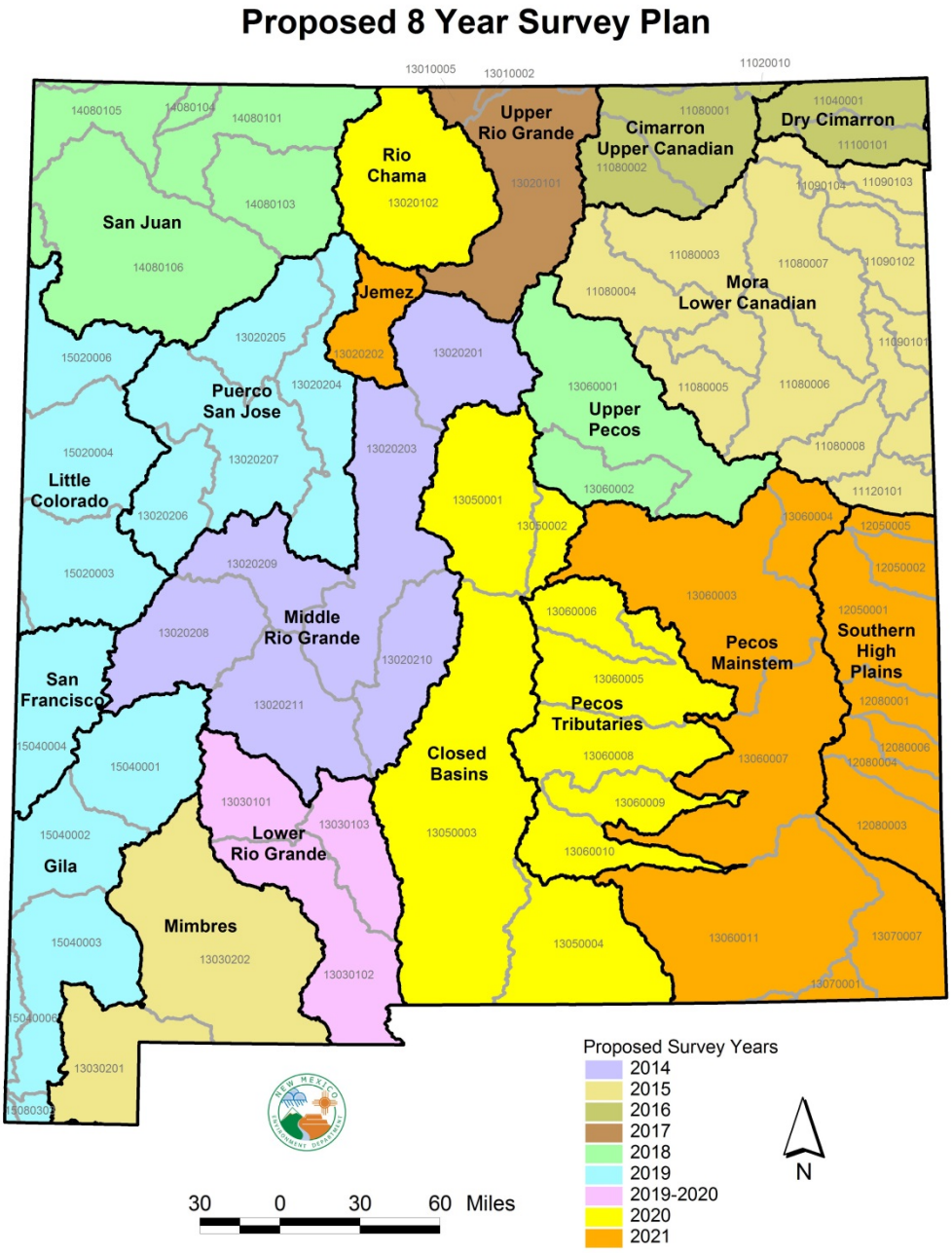


Figure 11. New Mexico's Surface Water Quality Monitoring Schedule

In the past, NMED, OSE, U.S. Bureau of Reclamation, and the City of Albuquerque collectively funded the USGS to conduct ambient monitoring at approximately 20 stations that comprised the State's long-term surface water quality surveillance network. These USGS stations were located on the major stream systems of New Mexico, and support a variety of projects across the State. Unfortunately, due to cuts to NMED's operating budget, USGS sampling previously funded by the State was discontinued starting in state FY2012, as NMED was the principal source of funding for several parameters at USGS gauges. This is a large loss to the State water quality monitoring community.

EPA has encouraged states to incorporate probabilistic sampling designs into their monitoring programs to potentially enable them to generate statistically-based conclusions regarding the overall state of water quality. Accordingly, some states have begun to incorporate probabilistic monitoring into their core monitoring strategies. However, successful sampling of random stations in the semiarid west is challenging due to a high percentage of intermittent and ephemeral waters, lack of hydrologic maps that accurately indicate perennial versus non-perennial waters, and difficult access logistics for many perennial waters located in remote mountainous headwaters. Although probabilistic-based monitoring can allow states to reach conclusions about surface water quality status as a whole, this type of monitoring cannot tell a state or tribal jurisdiction which specific water bodies are impaired or where to target CWA Section 319 watershed restoration funds, and do not provide the targeted data necessary for TMDL development. Therefore, many states -- including New Mexico -- continue to rely primarily on targeted sampling to answer these specific questions. See the 2014-2016 Integrated Report (Section C.5) for additional details.

Core Water Quality Indicators

Water quality trends and impairments are generally determined based on four broad types of monitoring data: biological, chemical, physical, and habitat. Each type of data yields an assessment that may then be integrated with other data types for an overall assessment. Depending on the designated use, one data type may be more informative than others for making an assessment. See inset box for details on the core indicators used by New Mexico to determine designated use impairments.

New Mexico's Core Water Quality Indicators

Chemical data include measurements of key chemical constituents in water and fish tissue. Examples of these measurements include metals, oils, pesticides, and nutrients such as nitrogen and phosphorus. Monitoring for specific chemicals helps states identify the causes for impairment and helps trace the source of the impairment.

Physical data include characteristics of water such as temperature, flow, dissolved oxygen, and pH. Physical attributes are useful screening indicators of potential problems, often because they can have an impact on the effects of chemicals.

Habitat assessments include descriptions of sites and surrounding land uses, condition of streamside vegetation, and measurement of features such as stream width, depth, flow and substrate. These data are used to supplement and interpret other kinds of data.

Biological integrity data are objective measurements of aquatic biological communities (usually aquatic insects, fish, or algae) used to evaluate the condition of an aquatic ecosystem. Biological data are most useful in deciding whether waters support aquatic life uses.

New Mexico's Lake Monitoring

Lake and reservoir monitoring in New Mexico is conducted to: (1) assess for attainment of applicable water quality standards; (2) collect information for standards development and to determine the trophic status for lakes or reservoirs where little or no physical, chemical, or biological information exits; and (3) update information with regard to trophic status of previously studied lakes or reservoirs. Lake surveys generally consist of a minimum three-season sampling efforts from one or two stations following the same rotation shown in Figure 11. Surveys for small lakes are usually conducted during the period of maximum stress to the aquatic ecosystem.

There are 196 publically-owned lakes, reservoirs, and playas that cover approximately 94,415 acres. These waterbodies consist of large main stem reservoirs, high-altitude natural lakes, and small fishing impoundments ranging in size from less than one acre up to 40,000 acres (Elephant Butte Reservoir at maximum storage pool). Regardless of size, all lakes are used extensively in water-scarce New Mexico. Even the smaller lakes provide water for livestock watering and habitat for wildlife, are used by migratory waterfowl, and can provide important recreational opportunities for boating, swimming, fishing, and aesthetic pleasure in municipal, rural, and wilderness settings.

Although all surface waters are considered important, NMED has prioritized the following publically-owned lakes, reservoirs, and playas as significant for monitoring purposes as funding resources allow:

- Lakes over 20 acres due to their many and varied uses;
- Lakes smaller than 20 acres where fish kills or pollutants threaten designated use attainment;
- Various playa lakes in New Mexico due to their unique ecological character and location in some of the most arid portions of the State; and
- High-altitude natural lakes that serve as sensitive indicators of potential acidic precipitation as well as nonpoint sources of pollution. Difficult access often restricts sampling efforts at these lakes.

Sampling on Eagle Nest Lake

Quality Assurance

The SWQB is committed to maintaining a quality assurance program that provides confidence in the environmental data produced by its various water quality programs. Water quality management programs are implemented in accordance with the current EPA-approved version of NMED's Quality Management Plan (QMP), which documents the quality system for planning, implementing, documenting, and assessing the effectiveness of activities supporting water quality management programs. In addition, all data collected by the SWQB are handled in accordance with the most current version of the EPA-approved QAPP (NMED/SWQB 2013). The QAPP describes the quality assurance procedures, quality control specifications, and other technical activities that must be implemented to ensure that the results of the project or task to be performed will meet project specifications. By establishing a quality system, New Mexico ensures that water quality management decisions are based on a systematic process and on data of known and acceptable quality. This also ensures that the public funds expended in these efforts are soundly invested. Further, in order for SWQB to utilize data collected by outside agencies or stakeholder groups a review of the quality assurance procedures is conducted to ensure that data is of equality or greater quality to those collected by SWQB under the QAPP.

Data Management

Numerous data management tools are utilized by the different water quality management programs in New Mexico. The tools include databases, geographic information systems (GIS), spreadsheets, statistical programs, and word processing computer software. To facilitate the integration of these tools, waterbodies are georeferenced based on geographic location and categorized based on waterbody type. Additional categories such as assessment unit (AU), watershed size/area, designated uses, ecoregion, elevation, sediment class, and habitat type are applied to facilitate data comparability and communication within and among the data management tools used by various water quality management programs. Databases currently utilized by SWQB include:

- Surface water QUality Information Database (SQUID) – On June 21, 2013, SWQB began using this new database, which houses water and fish tissue chemical data, as well as biological and habitat data. It combines the historical functionality of the Assessment Database (ADB), which is a relational database application for tracking water quality assessment data, including use attainment, and causes and sources of impairment and the New Mexico Ecological Data Application System (NMEDAS), which is a data management and analysis tool used for water surface quality monitoring data. SQUID has been updated to allow for automated assessment of water quality data, functionality that will save time and errors during the generation of the Integrated List. NMED was specifically asked to participate in EPA's ATTAINS Redesign effort, including invited attendance at the kick-off, early 2015 "Lean" event in Washington, D.C. as one of a handful of state representatives. SWQB staff currently co-chair the ATTAINS Design Team. NMED's SQUID has been presented to the ATTAINS Team as a potential database interface example for the redesign. The NMED Information Technology Bureau has been awarded an EPA Exchange Grant to modify SQUID as needed in order to pilot the ATTAINS Redesign during the 2016 Integrated Reporting cycle.

- STORET (short for STOrage and RETrieval) and WQX (Water Quality Exchange) - The EPA data management system that contains water quality information for the nation's waters, populated with biological, chemical, and physical data on surface and ground water collected by federal, state and local agencies, tribal governments, volunteer groups, academics and others. All 50 States, territories, tribes and jurisdictions of the U.S. are represented in the system. SWQB uploads all validated and verified chemical/physical data to STORET/WQX on an annual basis through automated XML exchange process in SQUID. All validated SWQB data used for assessment are available on WQX, which is publically available at: http://www.epa.gov/STORET/wqx/index.html.

- Grants Reporting and Tracking System (GRTS) - The Nonpoint Source Program's main reporting vehicle for the CWA Section 319 program. GRTS is a data management system that enables EPA and the states to describe the progress they have made in implementing the national Nonpoint Source Pollution program. GRTS electronically

tracks projects and activities funded with CWA Section 319(h) funds, and is available at: http://ofmpub.epa.gov/apex/grts/f?p=GRTS:199.

- Enforcement and Compliance History Online (ECHO) - EPA's database that provides integrated compliance and enforcement information for approximately 800,000 regulated facilities nationwide. Information available through this database includes, but is not limited to: status of compliance inspections, detected violations, and information regarding enforcement actions. As New Mexico does not have primacy over the NPDES program all data in ECHO for New Mexico facilities are entered by EPA. ECHO is available at: http://echo.epa.gov/?redirect=echo.

- SWQB's PSRS/NPDES database – This Oracle-based, web platform database that helps NMED PSRS track the status of NPDES permits and certifications. The database contains information about individual permits in relation to receiving water and Water Quality Standards Segments for integration into Bureau projects such as TMDL development and watershed assessment/planning activities. This database does not contain all of the data available through EPA's NPDES data management systems.

- The CERTMAN (CERTification MANagement System) - Web-based application and database containing information pertaining to the Utility Operator Certification Program, which is maintained by NMED. Users can access operator contact information, certification status, and exam results.

Data Analysis/Assessment

Data are analyzed in a variety of manners depending on the objectives. Computer database and spreadsheet programs are used to examine water quality trends, relationships, and results. Data are assessed against the most current version of the *State of New Mexico Standards for Interstate and Intrastate Surface Waters* [20.6.4 NMAC]. All data available that are considered to be of acceptable quality are assessed to determine designated use attainment status by using the protocols described in the *State of New Mexico Procedures for Assessing Standards Attainment for the Integrated 303(d)/305(b) Water Quality Monitoring and Assessment Report* [Assessment Protocol] (NMED/SWQB 2015b). See Section C.2 below for additional details.

Sampling on Conchas Lake

Reporting

Data analysis and assessment results are reported in numerous documents. The most comprehensive and inclusive reporting mechanism is this biennial Integrated Report, the *State of New Mexico CWA Section 303(d)/Section 305(b) Integrated Report*. Other documents that report results include, but are not limited to the following:

- Survey summaries (results of rotational watershed surveys);
- TMDL planning documents (wasteload and load allocations);
- Special project summaries (results from special projects);
- Nonpoint Source Annual Report and project summary reports (results pertaining to the impacts of NPS Implementation Projects);
- Watershed Restoration Action Strategies (WRAS) and Watershed-Based Plans (WBPs); and
- Use attainability analyses (present information regarding attainable designated uses).

For more information on SWQB's Monitoring, Standards, and Assessment Program and reporting, see https://www.env.nm.gov/swqb/MAS/.

General Support and Infrastructure Planning

Currently New Mexico receives resources to support a basic monitoring effort that enables all watersheds to be intensively monitored approximately once every eight years. Occasionally, limited supplemental funding is received for special monitoring projects or emergency situations. Each year, the SWQB strives to monitor two to three watersheds at the USGS 8-digit Hydrologic Unit Code (HUC) level.

Additional resources may allow SWQB to:

- Incorporate probabilistic sampling design components into the statewide monitoring strategy;
- Collect more data to update and maintain the fish consumption advisory program;
- Restore NPDES compliance monitoring activities;
- Expand lake and reservoir monitoring efforts;
- Refine and expand numeric translators for nutrients, bottom deposits, and benthic macroinvertebrate bioassessments;
- Refine monitoring methods and assessment protocols for non-wadeable rivers;
- Increase sampling frequencies to improve statistical confidence of listings;
- Shorten the assessment return interval; and
- Contract with non-government analytical laboratories to increase the scope of analyses conducted and to replace services that had previously been provided by SLD.

C.2 Listing Methodology

The listing methodology described in the Assessment Protocol (NMED/SWQB 2015b) constitutes the decision process that New Mexico employs to determine which attainment category a segment belongs in. The Assessment Protocol describes how all readily available data and information are identified and considered, the basic quality assurance and quality control criteria used to evaluate outside sources of data, and the analytical approaches used to infer segment condition. The assessment methodologies described in the Assessment Protocol are reviewed each reporting cycle to ensure the methods are consistent with applicable water quality standards, incorporate new guidance provided by EPA, and clarify assessment protocols. For the 2014-2016 reporting cycle, enhancements included major revisions to the turbidity and the lake nutrient assessment protocols.

Prior to development of the draft Integrated List for each listing cycle, the public has an opportunity to provide comments to the Assessment Protocols through a public participation process that includes a minimum 30-day public comment period with public notification as defined in the WQMP/CPP (WQCC 2011). The Assessment Protocols used to develop the 2016-2018 Integrated List (Appendix A) were released for public comment in this manner.

In general, all readily available data less than five years old that have been assessed for consistency with the SWQB's data collection activities and quality assurance procedures are used to determine whether the applicable water quality standards are attained. Data older than five years old will be given a lower priority in assessment than newer data, particularly if new data indicate a change in water quality or the older data fail to meet data quality requirements. If there are only data greater than five years old available for a particular assessment unit, the assessment conclusions based on these older data will be carried over to the next list until more current data are available to assess. Outside sources of data are solicited via a public notice process prior to developing the CWA Section 303(d) *List of Impaired Waterbodies*. All data submitted from outside sources must meet the State's QA/QC requirements to be used in the assessment process.

Quality data sources could include, but are not limited to, the following:

- NMED SWQB chemical/physical, biological, habitat, bacteriological, or toxicological data
- collected during intensive watershed surveys using approved or otherwise accepted quantitative methods;
- Chemical/physical data from recent studies by NMED or other organizations, contractors, tribes, or individuals;
- USGS water quality data (provisional data shall not be used to make designated use support determinations);
- Chemical/physical data collected by LANL and NMED Oversight Bureau (publically available for download from *Intellus New Mexico* (http://www.intellusnmdata.com/reporting/home_reporting.cfm);
- Benthic macroinvertebrate, fish community, and/or fish tissue data collected by NMED or other organizations, contractors, tribes, or individuals;
- EPA-recognized protocols such as Environmental Monitoring and Assessment Program (EMAP), Rapid Bioassessment Protocols (RBP), or other biological/habitat data collected by NMED and other organizations, contractors, tribes, or individuals;
- In-stream (i.e., receiving water) data collected during NMED effluent monitoring efforts;
- NPDES storm water permit compliance monitoring data for receiving waters;

- In-stream water quality data from other NMED bureaus such as the Drinking Water Bureau, and Ground Water Bureaus; and
- Citizen or volunteer monitoring data.

Nutrient Assessment Protocol Improvements for Wadeable Perennial Streams

Development of nutrient criteria has been an important, ongoing effort for states, tribes and EPA. Methods for developing and implementing numeric nutrient thresholds have evolved over time. Given the potential cost associated with implementation, use of frequency distributions alone is unsatisfactory since there is no linkage to impairment of aquatic systems. The SWQB, with the assistance of Tetra Tech through EPA's N-STEPS program, has identified nutrient threshold values for wadeable perennial streams utilizing regional data, reference conditions, links between cause and response variables, and verified classification systems. Documenting biological condition using standard metrics that are similar to metric values observed in reference sites provide a reliable indicator that designated aquatic life uses are being supported. The analysis included definition of reference sites and development of a site classification system. Candidate thresholds for total nitrogen and total phosphorus were derived by defining the relationships between nutrient concentrations and response variables (i.e., stressor-response relationships) in each site classification. Response variables included diatom and benthic macroinvertebrate assemblages, dissolved oxygen (DO), and chlorophyll a concentrations. A number of different diel DO metrics were explored, including overall minimum DO, maximum daily fluctuations, standard distribution statistics, maximum productivity and respiration, and system metabolism calculated as gross primary production and ecosystem respiration. The statistical techniques for relating stressors with responses included correlation analysis, regression interpolation, and change-point analysis. Reference conditions and stressor-response relationships were used to define potential numeric nutrient thresholds. As a result of the N-STEPS analysis, SWQB plans to update New Mexico's nutrient assessment protocol for wadeable perennial streams using the bio-confirmation/combined criteria approach proposed by EPA.

For additional information, visit http://www.nsteps.org/ and https://www.env.nm.gov/swqb/Nutrients/.

C.3 Water Quality Assessment Results

New Mexico maintains assessment information in SQUID as of 2013 (assessment data were previously housed in New Mexico's version of the Assessment Database). Use of this database allows SWQB to automatically generate the complete Integrated List, the associated Record of Decision (ROD) which provides additional information on impaired waters, the Category 5 *CWA Section 303(d) List of Impaired Waters*, as well as a variety of cause, source and impairment category summary reports. The results are organized by water body type (Rivers/Streams followed by Lakes/Reservoirs) and presented in the following sections.

Rivers and Streams

Water Quality Attainment Status and Categorization of New Mexico's Rivers and Streams

Table 9. Integrated Report Categories for New Mexico's Rivers and Streams

Category	Total Size (miles)	Number of River/Stream Assessment Units
1	1,013	62
2	1,256	128
3A	1,386	128
3B	9	2
4A	1,264	76
4B	0*	0*
4C	151	13
5A	1,128	88
5B	461	34
5C	1,065	92
TOTAL	**7,734**	**623**

NOTE: This information was generated using SQUID. ~~Categories 3 and 5 above are composites of New Mexico Categories 3A and 3B; and 5A, 5B, and 5C, respectively~~.
* There is an IR Category 4B demonstration in place for one pollutant pair (Sandia Canyon, dissolved copper).

New Mexico's surface waters assigned to one of the integrated reporting categories defined in Table 1 are summarized in Table 9. Individual Report categories for every assessment unit on the Integrated List are presented in the Integrated List (Appendix A).

The largest grouping of assessed lotic (i.e., flowing) waters are Category 5. These 214 assessment units cover approximately 2,655 stream miles, and along with the Category 5 lake/reservoir water bodies, comprise New Mexico's official CWA Section 303(d) waters. A list of Category 5-only waters was generated from SQUID and is included in the beginning of Appendix A.

IR Category 4A represents stream reaches where TMDL planning documents have been developed for all documented parameters in a particular AU. These 76 stream reaches, covering approximately 1,264 stream miles, are technically still noted as impaired even though they are not official considered to be part of the Clean Water Act Section 303(d) list by EPA. Several of these stream reaches also have TMDLs for more than one parameter.

IR Category 2 includes 128 assessment units, covering approximately 1,256 stream miles. Assessment units 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 uses are attained based on numeric and narrative water quality criteria that were tested. Attainment status of the remaining uses is unknown because there are no reliable monitoring data with which to make a determination.

There are 130 stream reaches (covering approximately 1,396 stream miles) identified as Category 3. Assessment units are listed in this category when data to support an attainment determination for any designated use are not available according to the requirements of the State's assessment and listing methodology. Reasons include access, monitoring and/or analytical logistics (such as the need for automated sampling equipment), and staff and financial resource constraints.

New Mexico's Summary of Designated Use Support for Rivers and Streams

A summary of the river/stream attainment status for each designated use, as found in New Mexico's WQS, is presented in Table 10. These summaries are primarily based on water quality monitoring conducted by the SWQB as part of intensive watershed surveys and targeted monitoring.

In New Mexico, the CWA goal of "fishable" is now reported under the various aquatic life uses currently in New Mexico's WQS (20.6.4. NMAC), and the "swimmable" goal is reported under primary and secondary contact uses. EPA developed this method to reduce inconsistencies in states' reports.

Table 10. Designated Use Support for New Mexico's Rivers and Streams

Designated Use	Total Size (mi)	Size Assessed (mi)	Size Fully Supporting (mi)	Size Not Supporting (mi)	Size Not Assessed (mi)
Coldwater Aquatic Life	912.6	707.6	184.9	522.7	205.1
Coolwater Aquatic Life	200.2	145.1	26.6	118.5	55.1
Domestic Water Supply	2644.5	2232.5	2192.3	40.1	412.1
Fish Culture*	1272.5	--	--	--	1272.5
High Quality Coldwater Aquatic Life	2536.6	2302.7	810.8	1492.0	233.9
Industrial Water Supply*	456.8	--	--	--	456.8
Irrigation	6410.0	5590.6	5442.0	148.6	819.4
Limited Aquatic Life	181.9	94.7	17.3	77.4	87.2
Livestock Watering	7742.3	5537.6	5428.9	108.6	2204.8
Marginal Coldwater Aquatic Life	1027.5	947.3	364.2	583.0	80.3
Marginal Warmwater Aquatic Life	2216.1	1376.8	823.0	553.8	839.3
Primary Contact	6862.7	4430.2	3279.3	1151.0	2432.4
Public Water Supply*	749.5	--	--	--	749.5
Secondary Contact	879.7	609.6	583.6	26.0	270.1
Warmwater Aquatic Life	1776.7	1572.0	1057.9	514.1	204.7
Wildlife Habitat	7742.3	5999.6	5784.8	214.8	1742.7

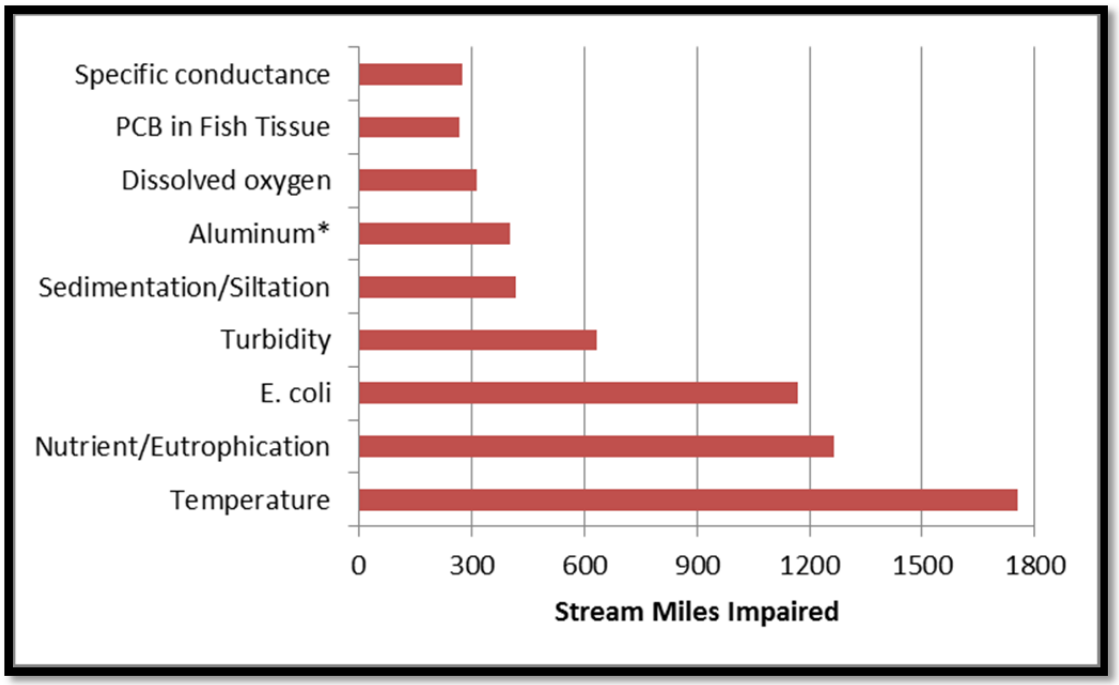
* = All Fish Culture, Public Water Supply, and Industrial Water Supply designated uses were defaulted to “Not Assessed” because no numeric criteria apply uniquely to these uses per 20.6.4.900 Subsection A NMAC.

Causes of Surface Water Impairment for Rivers and Streams

The leading impairment causes for New Mexico's rivers and streams are presented in Figure 12. The conclusions are primarily based on water quality monitoring conducted by NMED as part of rotational watershed surveys, fixed station monitoring, and targeted monitoring. The SQUID-generated summary report of all Cause and Source statistics is provided in Appendix B. Standard EPA impairment cause categories included in SQUID were used to label the graphic. See Appendix B for subcategory information.

Excessive temperature, nutrient/eutrophication, and *E. coli* are identified as the top three causes of impairment of designated uses in New Mexico's streams and rivers based on current WQS (20.6.4 NMAC), available data, and applicable assessment protocols. Dissolved oxygen (DO) and nutrient/eutrophication impairments may be redundant in some cases, as DO impairment is often a response variable as a result of excessive nutrients. The SWQB is implementing several nutrient criteria development projects that continue to address this redundancy through improved monitoring and assessment methodologies (see http://www.nmenv.state.nm.us/swqb/Nutrients/ for additional details).

E. coli sampling during watershed surveys has been a SWQB priority since the 2006 listing cycle, using a mobile *E. coli* sampling unit that resolved a chronic issue with meeting the 6-hour holding time. Implementation of this sampling method continues to result in the identification of additional contact use impairments, due to exceedence of the *E. coli* criteria, each listing cycle.



*Aluminum includes past listings with non-hardness based criteria, as well as acute and chronic listings

Figure 12. Top Causes of Surface Water Impairment for Rivers and Streams

Sources of Surface Water Impairment for Rivers and Streams

A summary of the top impairment sources as documented in TMDLs for New Mexico's rivers and streams is presented in Figure 13. The SQUID-generated report that was used to generate the below figure is included in Appendix B. Standard EPA source categories included in SQUID were used to label the graphic. See Appendix B for specific values and subcategory information.

"Sources" are defined as activities that may contribute pollutants or stressors to a water body (EPA 1997). The probable source list included with any cause of impairment includes any and all activities that could be contributing to the identified impairment. It is not intended to single out any particular land owner or single land management activity, and has therefore been labeled "Probable" and generally includes several possible items. Probable sources listed for any particular water body have not been proven to be a source or the only sources of the identified impairment. It is based on qualitative field observations made by field staff for assessment units sampled during rotational watershed surveys and watershed restoration projects. This is combined with knowledge of known land management activities that have the potential to contribute to the identified impairment.

The approach for identifying "Probable Sources of Impairment" was modified by the SWQB starting with the 2012 listing cycle. Any new impairment listings are assigned a Probable Source of "Source Unknown." For the 2014 listing cycle, SWQB removed previously-reported non-TMDL Probable Source lists from the IR List, and replaced them with "Source Unknown" for consistency throughout the list with respect to this approach. Therefore, all reported Probable Source lists on the Integrated List now have been through the TMDL process. Probable Source Sheets will continue to be completed during rotational watershed surveys and watershed restoration activities by SWQB staff. Information gathered from the Probable Source Sheets will be used to generate a draft Probable Source list in consequent TMDL planning documents. These draft Probable Source lists will be finalized with watershed group/stakeholder input received during any one of the following: pre-survey public meeting, TMDL public meeting, watershed-based planning activities, and various public comment periods. The SWQB has also created a web site to solicit further input on Probable Sources (http://www.nmenv.state.nm.us/swqb/PS/), and has developed a standard operating procedure for this topic (available at: http://www.nmenv.state.nm.us/swqb/SOP/). The final Probable Source list in the approved TMDL process will be incorporated into the next Integrated List.

For development of the Integrated List, identified probable sources are incorporated into SQUID, which allows the stream miles for each particular probable source assigned to an impaired assessment unit to be totaled. The total mileage values reported are summations of AU mileages for all AU-impairment pairs assigned each particular probable source. For example, if an AU is newly listed for temperature, sedimentation, and *E. coli*, Source Unknown is assigned to each of these AU-impairment pairs so three times the associated AU mileage is added to the Source Unknown tally. SQUID generates summary reports that break down probable sources of impairment into major categories and subcategories. This metric is imprecise as it does not contain information on the relative concentrations of any of the given probable sources as this level of detail is not available given current source identification resources. The complete report is contained in Appendix B. In most instances, more than a single probable source contributes to water quality impairment.

As shown in Figure 13~~12~~, the leading known probable source of impairment in New Mexico's rivers and streams is rangeland grazing, which is consistent with the widespread use

occurrence of this activity in New Mexico where TMDLs have been prepared, and is more than twice as common a source than the next most common probable source (~~On-Site treatment systems~~drought-related impacts). Other probable sources documented in TMDLs include on-site treatment systems, loss of riparian habitat, streambank modification, wildlife other than waterfowl, ~~drought-related impacts,~~ flow alterations from water diversions, waterfowl, municipal point source discharges, recreational pollution sources, and road/bridge runoff. These occurrences are believed to contribute to localized water quality problems in certain areas of the State. On-site treatment systems (i.e., septic tanks), which are primarily domestic liquid waste disposal systems (under state regulations, treat 5,000 gallons per day or less), can lead to water quality impairments if they are installed in close proximity to other systems or water bodies, improperly installed, or poorly maintained. To help address these problems, the regulations applicable to these systems were significantly revised in 2005. Additional information is available at: https://www.env.nm.gov/fod/LiquidWaste/.

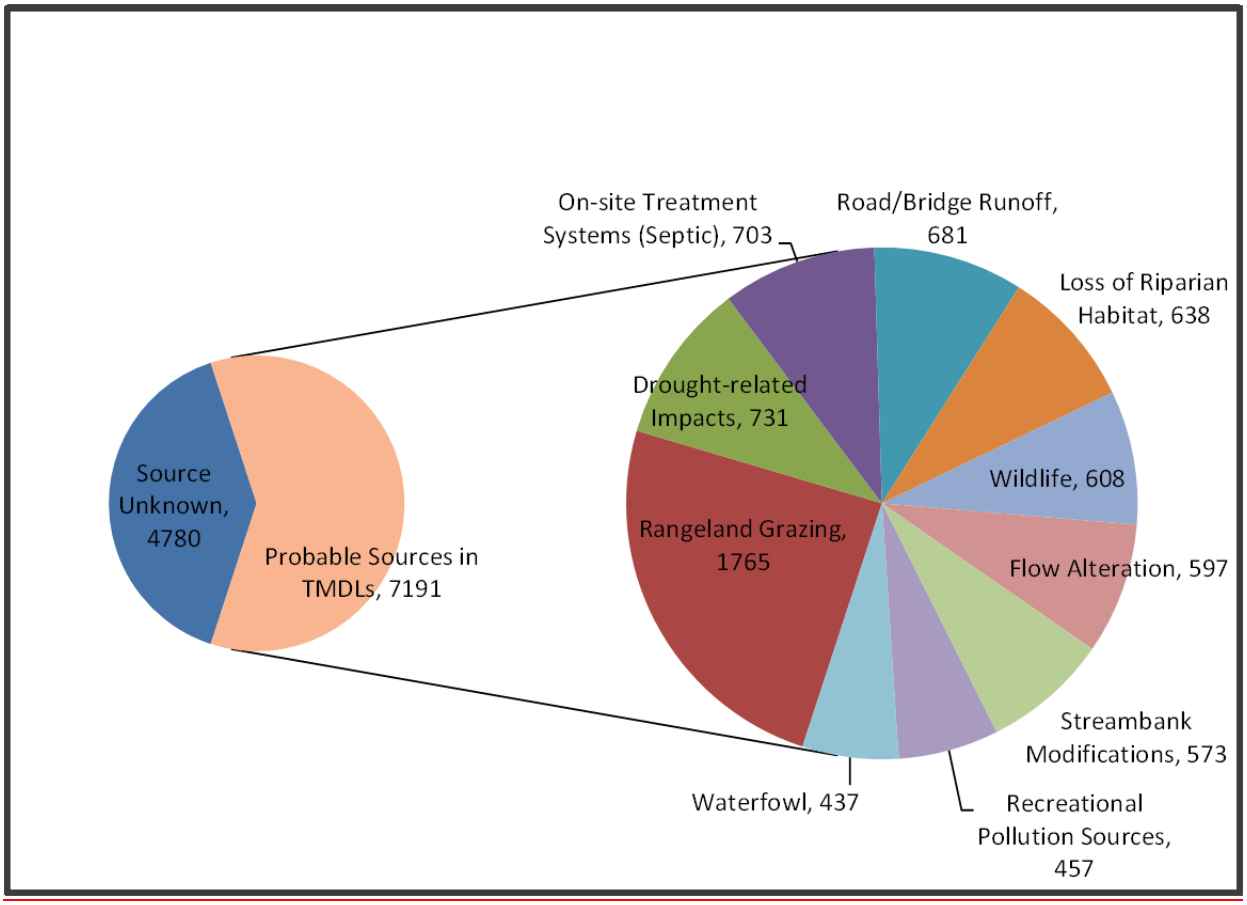


Figure 13. Top Probable Sources of Surface Water Impairment for Rivers and Streams ~~in TMDLs~~ (total AU-impairment pair mileage shown)

Like other western states, point source discharges play a quantitatively minor role with respect to pollutant loading compared to nonpoint sources in the impairment of New Mexico's streams and rivers. While poorly operated or maintained wastewater treatment plants may have significant adverse localized effects on water quality, the available data indicate that New Mexico, working with EPA and NPDES permittees, has been largely successful in reducing point source impacts on the State's surface waters.

Lakes and Reservoirs

Water Quality Attainment Status and Categorization of New Mexico's Lakes and Reservoirs

The development of an adequate monitoring and assessment program for lakes still lags behind that for New Mexico's rivers and streams. One major challenge regarding both lake monitoring and lake TMDL development has been the loss of specific CWA Section 314 funds to address this need. In the past, states received this funding specifically targeted for lake monitoring. States must now carve out their own funding for lake monitoring from core CWA Section 106 funds. New revenue sources must be identified to increase lake and reservoir monitoring in order to support future TMDL development and provide water quality information to the public who utilize these lakes and reservoirs. A more robust program could confirm the current cause and source impairment information regarding lakes and reservoirs with more scientifically rigorous data and information.

Table 11. Summary of Impairment Report Categories for New Mexico's Lakes and Reservoirs

Category	Total Size (acres)	Number of Assessment Units
1	963	12
2	9,029	18
3A	20,673	126
3B	0	0
4A	0	0
4B	0	0
4C	0	0
5A	20,717	20
5B	58	2
5C	37,633	19
TOTAL	**89,073**	**197**

NOTE: This information was generated using New Mexico's version of ~~EPA's ADB database~~SQUID. ~~Category 5 above is a composite of New Mexico Categories 5A, 5B, and 5C.~~

Table 11 shows the number of New Mexico's lakes and reservoirs assigned to each Report category as defined in Table 1. Individual Report categories are presented for every assessment unit on the Integrated List in Appendix A.

By acreage, the majority of assessed lentic (i.e., not flowing) assessment units in New Mexico fall under Category 5. These 41 waterbodies comprise approximately 58,408 acres. Over 90% of these acres are freshwater reservoirs (as opposed to natural lakes). New

Mexico has very few natural lakes compared to the number of on-line and off-line reservoirs. These assessment units, along with the Category 5 river/stream water bodies, comprise New Mexico's CWA Section 303(d) waters. A list of Category 5-only waters was generated from SQUID and is included in Appendix A. New Mexico has yet to develop lake TMDLs, as noted by the absence of lakes or reservoirs in Category 4A.

Approximately 20,673 acres (126 lakes or reservoirs) are grouped under Category 3. Assessment units are listed in this category when current data are not available to support an attainment determination. Reasons for this generally include access issues, monitoring and/or analytical logistics, and staff and financial resource constraints. Many of these lakes that are "Not Assessed" are very small in size, such as high elevation natural lakes. These lakes are logistically difficult to sample because they require long, steep hikes. SWQB sampled a representative subset of these lakes during 2007 as part of a nutrient criteria development grant. Also included in this category are a large portion of the over 23,000 acres of playa lakes that were part of a SWQB special study in the late 1980s and early 1990s when the EPA provided specific CWA Section 314 monitoring funding. Attainment status for playas or lakes where adequate resources have not been available to re-monitor in more recent years were changed to "Not Assessed" during the 2008 listing cycle because these data were over 15 years old. Playas or lakes where data from only one sampling event were previously used to make Full Support determinations were changed to "Not Assessed" during the 2014 listing cycle because this is considered to be insufficient data to make attainment determinations under current assessment protocols (NMED/SWQB 2015b).

New Mexico's Summary of Designated Use Support for Lakes and Reservoirs

A summary of the lake/reservoir attainment status for each designated use, as found in New Mexico's WQS, is presented in Table 12. These results are primarily based on targeted water quality monitoring conducted by the SWQB as part of rotational watershed surveys, best professional judgment, and qualitative assessments.

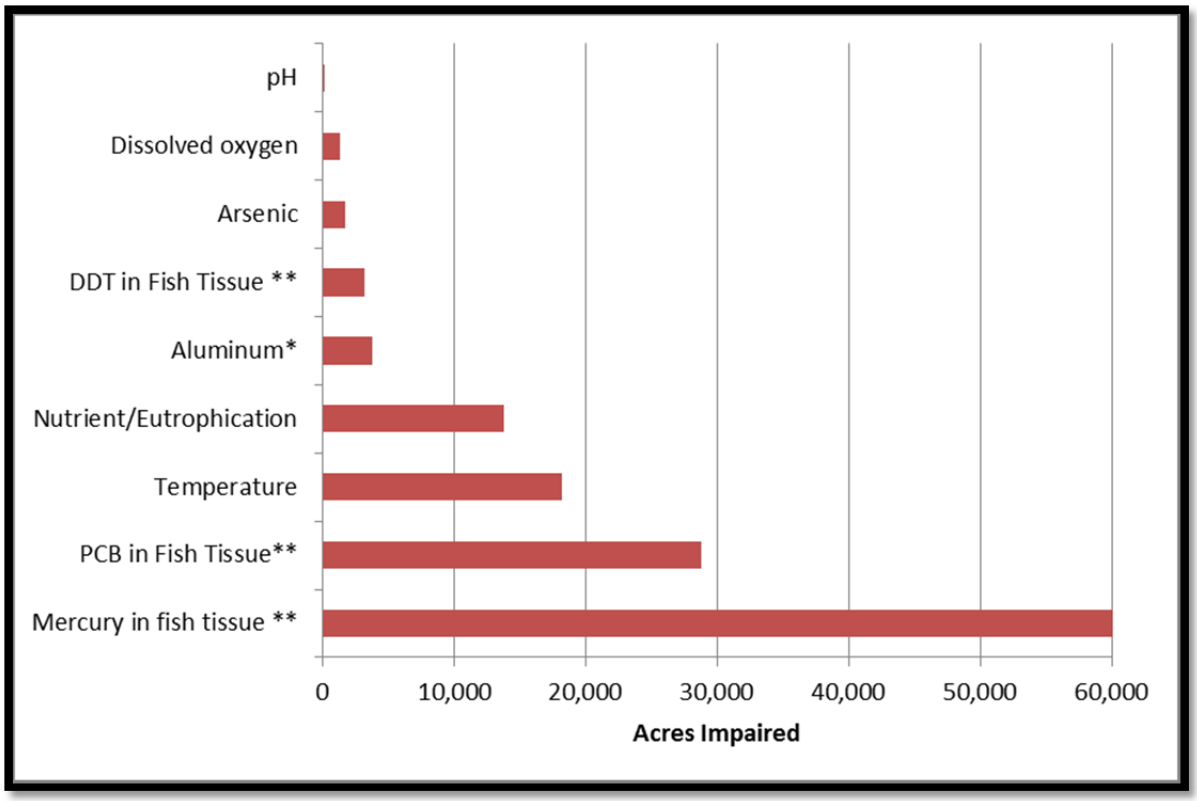
Causes of Surface Water Impairment for Lakes and Reservoirs

A summary of the impairment causes for New Mexico's lakes and reservoirs is presented in Figure 14. These determinations are primarily based on water quality monitoring conducted by the SWQB as part of rotational watershed surveys and targeted monitoring. The SQUID-generated report that was used to generate the below figure is included in Appendix B. Standard EPA cause categories included in SQUID were used to label the graphic. See Appendix B for specific acreage and subcategory information.

Table 12. Individual Designated Use Support Summary for New Mexico Lakes and Reservoirs

Designated Use	Total Size (acre)	Size Assessed (acre)	Size Fully Supporting (acre)	Size Not Supporting (acre)	Size Not Assessed (acre)
Coldwater Aquatic Life	24720.6	24632.0	3222.5	21409.6	88.6
Coolwater Aquatic Life	5686.2	181.3	0.0	181.3	5504.9
Domestic Water Supply	2518.1	2235.9	903.9	1332.0	282.2
Fish Culture*	38.9	--	--	--	38.9
High Quality Coldwater Aquatic Life	1909.5	1627.3	62.0	1565.3	282.2
Industrial Water Supply*	16772.2	--	--	--	16772.2
Irrigation	8871.4	7831.6	7831.6	0.0	1039.8
Irrigation Storage	48430.5	48430.5	48430.5	0.0	0.0
Livestock Watering	89051.4	62672.0	62672.0	0.0	26379.4
Marginal Coldwater Aquatic Life	740.8	615.1	615.1	0.0	125.7
Marginal Warmwater Aquatic Life	28537.3	4842.5	11.2	4831.4	23694.8
Primary Contact	87713.2	60898.8	60898.8	0.0	26814.4
Public Water Supply*	36274.7	--	--	--	36274.7
Secondary Contact	1359.9	487.8	487.8	0.0	872.1
Warmwater Aquatic Life	49260.8	48041.9	14915.2	33126.7	1218.9
Wildlife Habitat	89073.1	68400.2	68400.2	0.0	20672.9

* = All Fish Culture, Public Water Supply, and Industrial Water Supply designated uses are defaulted to “Not Assessed” because no numeric criteria apply uniquely to these uses per 20.6.4.900 Subsection A NMAC.



**Based on fish consumption advisories in place.

Figure 14. Top Causes of Surface Water Impairment for Lakes and Reservoirs

Mercury and PCBs in fish tissue, and temperature are the top three causes of impairment of designated uses in New Mexico's lakes and reservoirs based on current WQS, available data, and current assessment procedures. EPA considers fish or shellfish consumption advisories and supporting fish tissue data to be existing and readily available data that demonstrate non-attainment of CWA goals stating that waters should be "fishable" (CWA Section 101(a), EPA 2005). New Mexico currently has fish consumption advisories based on mercury, DDT, and PCB levels in fish tissue (NMDOH *et al*. 2015). All waterbodies listed in the advisory are listed as impaired except waterbodies where available mercury in fish tissue data are below the New Mexico water quality criterion of 0.3 mg/kg. The dissolved oxygen impairment listing may be related to excessive nutrients.

SWQB recently developed nutrient assessment protocols for lakes and reservoirs, starting with the 2014 listing cycle. In general, the total impaired acreages for individual pollutants remained fairly close to the 2012 listing, however nutrient/eutrophication impairments doubled from 2012, likely due to the newly developed assessment protocol, and is expected to increase as this new nutrient assessment protocol is applied to future lakes and reservoirs around the State.

Sources of Surface Water Impairment for Lakes and Reservoirs

Based on SWQB's revised approach for determining probable sources, and the fact that the State has not yet written any lake TMDLS, all impairments have been given a probably source of "source unknown". However, it is likely that atmospheric deposition of toxics will continue to be the dominant probable source, as was indicated in the 2012 Integrated Report.

C.4 CWA Section 303(d) List – Impaired Waters in New Mexico

Assessment units noted as Category 5A, 5B, or 5C on the Integrated List comprise New Mexico's CWA Section 303(d) list of impaired waters. A listing of Category 5-only waters was generated from SQUID and is included in the beginning of Appendix A. To see details on a particular impaired assessment unit, refer to the particular assessment unit entry on the full Integrated List (Appendix A). The causes and sources of these impairments are summarized by waterbody type (rivers/streams vs. lakes/reservoirs) in the section C.3 above. The associated Record of Decision (ROD) document maintained by the SWQB is a historical record of impaired surface waters (i.e., Category 5 waters) provided to reviewers and users of the list -- including EPA -- to help track listing and de-listing information used in the development of New Mexico's Integrated List. EPA does not require this document and does not take action to approve or disapprove of its contents. All assessment units do not have detailed ROD entries because the ROD generally does not contain entries on assessment units that have not been assessed or have never been found to be impaired.

New Mexico's Integrated List also includes a projected "TMDL DATE" for all assessment unit–parameter impairment pairs. This field contains either 1) estimated (abbreviated as "est." due to field size constraints) TMDL development year based on SWQB's rotational monitoring schedule, prioritization strategy in SWQB's Long Term Vision document (NMED/EPA 2015c), date since last intensively surveyed, upcoming permit renewals, severity of the pollution, which designated use(s) are impaired, etc.; 2) the EPA TMDL approval date (MM/DD/YYYY) if a TMDL has already been developed and approved; or 3) nothing if the water quality standard is under review (IR Category 5B) or additional data are needed (IR Category 5C). This date, as well as the "MONITORING SCHEDULE" year, is ultimately dependent upon personnel and financial resources which change on an annual basis.

EPA has completed a statistical survey of the nation's rivers and streams as part of the National Aquatic Resource Surveys (NARS). SWQB prepared an evaluation that compares the data and assessment conclusions collected via EPA NARS statistical surveys to SWQB data collected via census-based watershed survey. This comparison is available in Section C.5 of the 2014-2016 Integrated Report (https://www.env.nm.gov/swqb/303d-305b/2014-2016/2014-2016NMReport.pdf).

PART D - GROUND WATER MONITORING AND ASSESSMENT

D.1 Ground Water in New Mexico

New Mexico's ground water resources are of vital importance in sustaining life, and must be preserved and protected for both present and future generations. Approximately 50% of New Mexicans depend solely on ground water for drinking water. This is a decrease from 90% four years ago due to the recent addition of surface water to augment the public water supplies of Albuquerque and Santa Fe. Eighty percent of New Mexicans are served by public systems with water derived from ground water sources and over 295,600 New Mexicans – 14.5% of the State's population - depend on private wells for drinking water (OSE 2010). Nearly half of the total water annually withdrawn for all uses in New Mexico, including agriculture and industry, is ground water, the only practicable source of water in many areas of the State. Overall, the quality of these waters is assumed to be good, although there are significant pollution problems known to affect certain areas of New Mexico.

New Mexico's hydrogeology is highly variable and complex, and ground water quality and availability are also highly variable. Sedimentary deposits (mainly sandstone, limestone, or unconsolidated sand and gravel) are the most productive and widespread aquifers in New Mexico. Valley-fill aquifers of major importance occur along the Rio Chama, the San Juan River, and the Pecos River. These aquifers are typically less than 200 feet thick and commonly provide water containing less than 1,000 milligrams per liter of total dissolved solids. A major aquifer occurs in the Rio Grande Valley where basin-fill deposits attain thicknesses of up to 20,000 feet, although only the uppermost several thousand feet contain fresh water. This aquifer provides a source of water for Albuquerque, Rio Rancho, and Santa Fe. Significant basin-fill aquifers also occur in the southwestern area of the State. The High Plains aquifer (primarily the Ogallala Formation) is a major water source along the eastern border of New Mexico. Major sandstone aquifers are also located in the San Juan Basin in the northwestern part of the State and limestone aquifers are of importance in the south-eastern part and locally in the central and western parts. In some areas with significant ground water use, ground water levels have declined due to withdrawals in excess of recharge (Bartolino and Cunningham, 2003).

D.2 Ground Water Monitoring and Protection Programs

New Mexico relies on several programs established under a variety of statutory authorities to protect and maintain ground water quality which are primarily conducted by the NMED Ground Water Quality Bureau (GWQB). The primary statute dealing with ground water quality management is the WQA. This Act created the WQCC and authorized it to adopt ground water quality protection regulations and standards. Key features of the WQA and regulations relating to ground water include:

- A requirement for dischargers to obtain a ground water discharge permit to prevent ground water contamination from discharges that have the potential to impact ground water quality;
- Requirements for reporting and addressing spills and releases;
- Development of ground water quality standards for ground water contaminants (20.6.2.3103 NMAC);
- Development of ground water pollution assessment and abatement regulations and underground injection control requirements; and
- Provisions for civil and criminal penalties for violation of the regulations and standards.

Programs established under the WQA, as well as under the New Mexico Oil and Gas Act, Hazardous Waste Act, Ground Water Protection Act, Solid Waste Act, Emergency Management Act, Voluntary Remediation Act, and Environmental Improvement Act, also contain provisions which are designed to protect ground water quality and which implement the ground water regulations and water quality standards directly or by reference. In addition, the State cooperates with local and federal governments on various programs relevant to ground water pollution control.

Ground water quality monitoring is typically required at permitted facilities to determine baseline ground water quality, serve as a leak detection method, and as part of remediation efforts to determine whether or not remediation efforts are effective. The GWQB also offers free water quality screening for domestic wells at water fairs routinely held around New Mexico.

D.3 Ground Water Quality Status

In the late 1970s, following promulgation of the WQCC regulations, the NMED began evaluating existing information on vulnerable aquifers and major known and potential contamination sources. This evaluation has become an ongoing process, as the focus has shifted from identification of major potential sources of contamination to specific questions about known or suspected ground water contamination problems.

Approximately 243 facilities with ground water discharge permits, or 34%, have confirmed ground water contamination, based on data from the 2015. These facilities are required to take corrective actions to address the contamination pursuant to permit conditions or abatement plans. An additional 128 sites with potential or confirmed ground water contamination are being addressed under spill response regulations, the voluntary remediation program, or abatement regulations.

Ground Water Sampling

D.4 Ground Water Contamination Sources

While household septic tanks or cesspools are the predominant source of nonpoint source contamination of ground water in New Mexico, such degradation may also be caused by other diffuse sources such as residual minerals from evapotranspiration, areas disturbed by mineral exploration, urban runoff, or application of agricultural chemicals. Point source categories include publicly and privately owned sewage treatment plants with flows over 5,000 gallons per day , dairy operations, mines, food processing operations, industrial discharges, landfills, above and underground storage tanks, petroleum processing and storage, and accidental spills or leaks.

Synthetically-lined Dairy Wastewater Lagoon

D.5 Significant Ground Water Issues

Dairy Discharge Permit Regulations

The WQA was amended in 2009 to require the consideration and adoption of industry-specific dairy wastewater discharge regulations by the WQCC. NMED completed development of these regulations pursuant to a schedule adopted by the WQCC. The process included numerous public meetings, meetings of an NMED-created advisory committee, and negotiations with interested stakeholders. A petition for rule change and proposed dairy discharge regulations were filed with the WQCC in December 2009, and a hearing on the proposed regulations was held by the WQCC in April and June 2010. After an appeal from the dairy industry and negotiations between the dairy industry and NMED, the WQCC approved amended rules in December 2011 and the rule became effective on December 31, 2011. More amendments were proposed by the dairy industry in September 2012 and August 2013. In April of 2015 a joint motion to adopt the proposed amendments was brought before the WQCC. These amendments were approved by the WQCC on May 11, 2015. The amended rule became effective August 1, 2015. NMED has begun the process of meeting with permittees to discuss the 77 draft permits to reflect changes in the rule, and modifications will be requested on many of the 55 final permits that were issued in 2013 and 2014.

Copper Rule Permit Regulations

Amendments to the WQA in 2009 also included a requirement that the WQCC consider and adopt industry-specific copper mine discharge regulations following the promulgation of the Dairy Rules. NMED completed development of these regulations pursuant to a schedule adopted by the WQCC. The process included several public meetings, meetings of NMED-created advisory and technical committees, and negotiations with interested stakeholders. A petition for rule change and proposed copper mine rule discharge regulations were filed with the WQCC in January 2012 and a hearing on the proposed regulations was held by the WQCC in April and June 2013. The rules were approved by the WQCC and became effective in on December 1, 2013. The Copper Mine Rule was appealed to the New Mexico Court of Appeals. Motions to Stay the Copper Mine Rule pending appeal were denied by the New Mexico Court of Appeals on May 7, 2014. The Copper Mine Rule was upheld by the New Mexico Court of Appeals on April 8, 2015. The decision by the New Mexico Court of Appeals is currently under review by the New Mexico Supreme Court.

Regulation of Discharges from Los Alamos National Laboratory

Los Alamos National Security, LLC (LANS) has numerous operations at Los Alamos National Laboratory (LANL) from which discharges of wastewater to the environment occur. Several regulatory agencies oversee activities at LANL, including the Ground Water Quality Bureau in collaboration with other Federal and State agencies, to ensure appropriate regulatory oversight and reduce dual regulation where applicable. Because of the historical and geographical extent of LANS' operations under the DOE, there is considerable public interest as it pertains to environmental protection.

Unplanned and unauthorized releases into the environment are reported to NMED for its review, and the GWQB responds to any corrective actions taken by LANS to address these releases. In 2014, NMED responded to 20 reportable releases. NMED also responded to nine Notices of Intent for proposed planned discharges at the facility during 2014. LANS currently has four

discharges which have been deemed to be under the authority of the WQCC regulations and are in various stages of the permitting process: the Radioactive Liquid Waste Treatment Facility (RLWTF), the Sanitary Waste Water System (SWWS), septic tank/leachfield systems, and surface disposal of treated of contaminated ground water derived through other regulated cleanups. A fifth discharge permit application was submitted in early 2015 for Underground Injection Control (UIC) wells associated with the chromium project.

The application for discharge from the RLWTF was first submitted to NMED on August 19, 1996, an updated application submitted on February 16, 2012, and an amendment to the application submitted to NMED on August 10, 2012. NMED has continued to meet with members from community organizations as well as several concerned citizens regarding the issuance of the discharge permit. LANS and DOE have appealed the issuance of their Hazardous Waste Facility Permit, including certain provisions related to the RLWTF. Therefore, the discharge permit addresses regulation of the RLWTF and is a critical element of the negotiations to settle the litigation. NMED anticipates submitting the draft discharge permit for additional public comment in early 2016.

NMED received an application for renewal and modification of the SWWS discharge permit in July 2010. The SWWS facility is the central domestic wastewater treatment system for domestic wastewater generated at LANL. It discharges to permitted NPDES outfalls or recirculates the treated effluent through other process control systems at the laboratory. It is anticipated that the draft discharge permit (DP-857) for the SWWS/SERF facility will be published for comment in early May or June 2016.

Numerous facilities at LANL which are not connected to the central SWWS still discharge domestic wastewater to multiple septic tank/leachfield systems. NMED has determined that these discharges are under the authority of the WQCC Regulations and are required to be regulated under a discharge permit. LANS submitted a discharge permit application in April 2006 and NMED has been in ongoing communication with LANS to obtain information on the extent of the systems in order to draft a discharge permit. There have been several updates and modifications to the original application. LANS submitted an updated application in 2010 that has formed the basis of NMED's draft discharge permit, which is anticipated to be sent out for public comment in early May or June 2016.

LANS submitted an application for surface discharge of treated ground water derived from a variety of environmental restoration projects in December 2011. NMED met with LANS/DOE staff, representatives from community organizations, and several concerned citizens regarding the draft permit, which was issued in early 2015, and issued the final permit in July 2015. In April 2015, LANS/DOE submitted an application for Class V UIC discharge of treated ground water derived from the chromium remediation project. NMED published a draft discharge permit and a hearing is scheduled for late May 2016.

Ground Water Discharge Permit Program Changes

Prevention of ground water contamination is more cost effective and technically achievable than remediation. Consequently, New Mexico continually works to improve the effectiveness of the ground water discharge permit program. Over the years, improved permit conditions have been developed to address issues identified as needing additional attention, such as contingency and closure plans, lining dairy lagoons with synthetic liners, septic system maintenance, the use of reclaimed wastewater, and provision of financial assurance.

As a result of a program efficiency review and the adoption of separate regulations for dairy discharge permits, GWQB created a new Agricultural Compliance Section in FY2015. Similar to the Mining Environmental Compliance Section's focus on mine facilities, ACS handles permitting and abatement at agricultural facilities, including dairies, chile and food processing operations, and other agricultural facilities.

Assessment of Grants Mining District

In 2010, NMED and EPA, in conjunction with federal, state, and tribal governmental entities developed a five-year plan to assess uranium mining impacts in the Grants Mining District in northwestern New Mexico, identify future work that may be required, and coordinate, guide and maximize available agency resources of the many federal, state and tribal government entities. A draft second five-year plan is currently being developed, with a public meeting in Grants, New Mexico scheduled for October 27, 2015 to present the draft second five-year plan to the public and various stakeholders.

The GWQB and EPA assessed the public health and environmental impacts resulting from extraction, processing, disposal and releases from legacy uranium mining and milling activities in the Grants Mining District. The Bureau's Superfund Oversight Section (SOS) conducted pre-CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System) screening assessments of 78 of the 97 legacy uranium mine sites identified in the District, and sampled approximately 60 existing wells in the San Mateo Creek Basin (SMB). . In addition, the GWQB SOS conducted a reassessment of the Lower SMC Basin in 2014-2015, to evaluate current water quality conditions and expand on the database of aquifer geochemistry information to support ongoing investigations of potential legacy uranium sites in the Grants Mining District.

Based on the GWQB's assessments of the Anaconda Company Bluewater and Ambrosia Lake Phillips former mill sites, DOE agreed to perform additional site characterization to address concerns identified during the assessments. Similarly, the Bureau of Land Management (BLM) agreed to review the findings of the screening assessments of mines on BLM-managed lands.

The GWQB is also evaluating legacy uranium mining impacts to ground water through the WQCC abatement regulations and ground water discharge permit regulations. This includes increased oversite of the Homestake Mining Company ground water abatement currently underway in accordance with a Nuclear Regulatory Agency Corrective Action Plan and ground water discharge permit DP-200, as well as regulatory oversite of an ongoing abatement proposal for the Rio Algom properties in the Ambrosia Lake sub-basin. This work is also being coordinated with EPA activities related to the Tronox settlement.

In addition to mining/milling facility assessments, EPA has assessed 451 exterior structures and has completed radon surveys for 209 interior structures, with an emphasis on residences that may have been affected by legacy mining and milling activities where there may be a threat to human health and the environment. Based on these assessments, initial removal and radon abatement activities are planned for 13 properties in the communities of Bibo, Seboyeta, and San Mateo. The GWQB SOS is developing strategies for assessment and cleanup criteria, as necessary, for sources of sediment, surface and ground water, and air contamination originating from these mines. This plan acknowledges that impacts from uranium mining and milling

extend beyond the Grants Mineral Belt. The proposed actions may therefore be extended to areas with similar activities.

PART E – PUBLIC PARTICIPATION

All individuals living and working in the State affect water quality and are affected by water quality. Public awareness and involvement is therefore crucial to the successful implementation of water quality programs. New Mexico's water quality programs promote a multi-stakeholder, consensus-based public participation process. By actively pursuing and considering public input and involvement, New Mexico can more effectively effect changes in behavior and actively improve decision-making concerning water quality with greater public acceptance and support for those decisions.

The public participation requirements of specific water quality programs are specified in 40 CFR Section 25.4 and described in the WQMP/CPP (NMWQCC 2011). At a minimum, the public participation process for New Mexico's water quality programs consists of the following:

- Providing the public with the information and assistance necessary for meaningful involvement;
- Providing a central location of reports, studies, plans, and other documents;
- Maintaining a list of affected or interested parties and stakeholders; and
- Notifying stakeholders in a timely fashion prior to consideration of major decisions (generally at least 30 days).

The public participation associated with the development of this Integrated Report and associated Integrated List (Appendix A) was conducted in accordance with these principles, and included notifying stakeholders of a 45-day public comment period February 3 - March 18, 2016 on the draft 2016-2016 Integrated Report and List. Public notice on the Integrated List is also a CWA requirement. Responses to public comments on the Integrated Report and List are included in Appendix C.

The State of New Mexico Statewide Water Quality Management Plan and Continuing Planning Process are available at: http://www.nmenv.state.nm.us/swqb/Planning/WQMP-CPP/

References

Bartolino J.R. and W.L Cunningham W.L. 2003. *Ground-Water Depletion Across the Nation*, U.S. Geological Survey Fact Sheet 103-03, 6p.

Brown, S., C. Hickey, B. Harrington, R. Gill, Ed. 2001. United States Shorebird Conservation Plan. Manomet Center for Conservation Sciences. Manomet, MA.

Bureau of Land Management (BLM). 2005. New Mexico Land Ownership Dataset. New Mexico State Office. Santa Fe, NM.

Bureau of Reclamation (BOR). 1976. New Mexico State Resources Assessment for Planning Purposes. United States Department of the Interior.

Cowardin, Lewis M., et al. 1979. Classification of wetlands and deepwater habitats of the United States. US Department of the Interior, US Fish and Wildlife Service, 1979. Available at: https://scholar.google.com/scholar?hl=en&q=National+Wetlands+Classification+System+%28Cowardin+et+al.+1979%29&btnG=&as_sdt=1%2C32&as_sdtp=

Gurdak, J. and C. Roe. 2009. Recharge rates and chemistry beneath playas of the high plains Aquifer – A Literature Review and Synthesis. Prepared in conjunction with the Playas Lakes Joint Venture. U.S. Geological Survey. Circular 1333. Available at: http://www.pljv.org/documents/USGS_circular_1333_summary.pdf.

National Research Council (NRC). 1995. Wetland Characteristics and Boundaries. Washington, DC: National Academy Press.

New Mexico Department of Health, New Mexico Environment Department, and New Mexico Department of Game and Fish (NMDOH et al.). 2015. Fish Consumption Advisories https://www.env.nm.gov/swqb/advisories/

New Mexico Environment Department/Surface Water Quality Bureau (NMED/SWQB). 2010. *State of New Mexico Surface Water Quality Bureau 10-Year Monitoring and Assessment Strategy*. Santa Fe, NM. Available at: https://www.env.nm.gov/swqb/MAS/monitoring/10-YearMonitoringPlan.pdf

_____. 2013. Quality Assurance Project Plan for Water Quality Management Programs. Santa Fe, NM. Available at: https://www.env.nm.gov/swqb/QAPP/.

_____. 2014a. New Mexico Nonpoint Source Management Program. Santa Fe, NM. Available at: https://www.env.nm.gov/swqb/wps/Plan/2014NPSPlan.pdf

_____. 2014b. State of New Mexico Nutrient Reduction Strategy for protecting and improving water quality. Santa Fe, NM. Available at: http://www.nmenv.state.nm.us/swqb/Nutrients/NutrientReductionStrategy-2014.pdf

_____. 2015a. Monitoring and Assessment Standard Operating Procedures. Santa Fe, NM. Available at:https://www.env.nm.gov/swqb/SOP/.

_____. 2015b. State of New Mexico Procedures for Assessing Standards Attainment for the Integrated 303(d)/305(b) Water Quality Monitoring and Assessment Report. Santa Fe, NM. Available at: https://www.env.nm.gov/swqb/protocols/.

_____. 2015c. Final Draft Prioritization Framework and Long Term Vision for Water Quality in New Mexico. Santa Fe, NM. Available at: https://www.env.nm.gov/swqb/TMDL/FinalDraft-PrioritizationFrameworkStrategy-NewMexicoJuly2015.pdf.

New Mexico Office of the State Engineer (OSE). 2010. Water Use By Categories 2010. New Mexico Office of the State Engineer Technical Report 54. Santa Fe, NM. Available at: http://www.ose.state.nm.us/Pub/TechnicalReports/TechReport%2054NM%20Water%20Use%20by%20Categories%20.pdf.

New Mexico Office of the State Engineer/Interstate Stream Commission (OSE/ISC). 2003. New Mexico State Water Plan. Santa Fe, NM.

_____. 2006. The Impact of Climate Change on NM's Water Supply and Ability to Manage Water Resources. Santa Fe, NM. Available at: http://www.nmdrought.state.nm.us/ClimateChangeImpact/completeREPORTfinal.pdf.

New Mexico Safe Drinking Water Information System (NM SDWIS). 2014. Available at: http://www.nmenv.state.nm.us/dwb/Labs/ .

New Mexico Water Quality Control Commission (WQCC). 2011. State of New Mexico Statewide Water Quality Management Plan and Continuing Planning Process. Santa Fe, New Mexico.

Smith, L. M. 2003. Playas of the Great Plains. Austin, TX: University of Texas Press.

Stoner, N K. 2011. Working in Partnership with States to Address Phosphorus and Nitrogen Pollution through Use of a Framework for State Nutrient Reductions Memo to Regional Administrators, U.S. Environmental Protection Agency, Regions 1–10. 16 March 2011.

Tiner, R. W. 2008. Dichotomous keys and mapping codes for wetland landscape position, landform, water flow path, and waterbody type descriptors. National Wetlands Inventory Project Northeast Region. US Fish and Wildlife Service. Hadley, MA. Available at: https://scholar.google.com/scholar?q=Landscape+Position%2C+Landform%2C+Waterbody+Type%2C+Water+Flow+Path%2C+Tiner+2003&btnG=&hl=en&as_sdt=0%2C32

United States Census Bureau. 2015. Quick facts: New Mexico. Available at: http://www.census.gov/quickfacts/table/PST045215/35,00.

United States Department of Agriculture Natural Resources Conservation Service (USDA/NRCS). 2000. *Summary Report 1997 Natural Resources Inventory*. Revised December, 2000. Washington, D.C.

United States Environmental Protection Agency (EPA). 2003a. Asset Management: A Handbook for Small Water Systems 2003. (4606M) EPA 816-R-03-016. Office of Water.

Available at:
http://epa.gov/safewater/smallsystems/pdfs/guide_smallsystems_asset_mgmnt.pdf

_____. 2003b. Elements of a state water monitoring and assessment program. Assessment and Watershed Protection Division, Office of Wetlands, Oceans, and Watersheds. March. EPA 841-B-03-003. Washington, D.C.

———. 2004. NPDES Compliance Inspection Manual. EPA 305-X-04-001. Office of Enforcement and Compliance Assurance, Washington, DC. July.

_____. 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act. Office of Water. Washington, D.C.

_____. 2015. Information Concerning 2016 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions. Memorandum dated August 13, 2015. Office of Wetlands, Oceans, and Watersheds. Washington, D.C. Available at: http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/guidance.cfm.

United State Fish and Wildlife Service (USFWS). 2004. North American Waterfowl Management Plan 2004. Implementation Framework: Strengthening the Biological Foundation. Canadian Wildlife Service, U.S. Fish and Wildlife Service, Secretaria de Medio Ambiente y Recursos Naturales, 106 pp.

United States Geological Survey (USGS). 2012. National Hydrography Dataset (NHD) Plus V2. Available at: http://www.horizon-systems.com/NHDPlus/NHDPlusV2_home.php