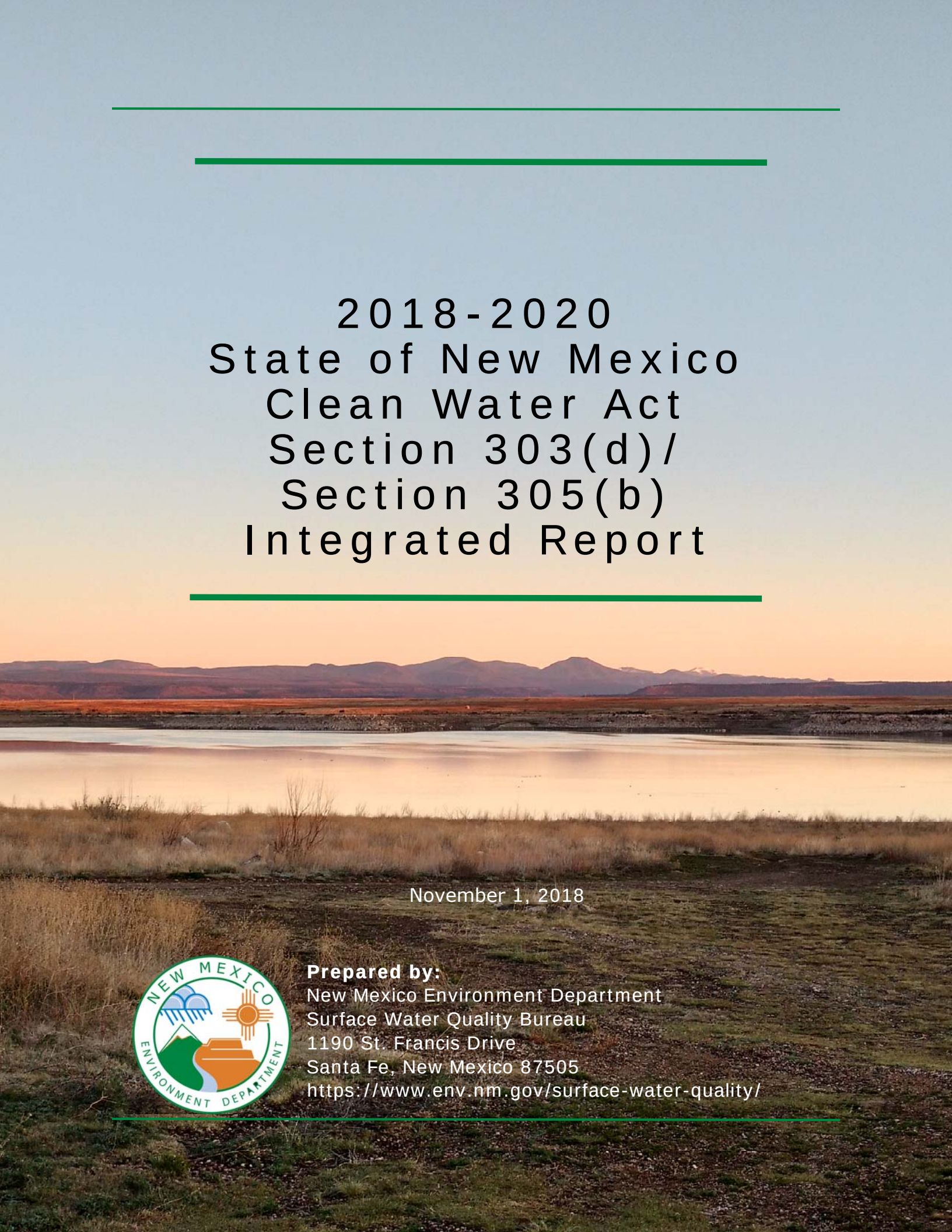

2018-2020 State of New Mexico Clean Water Act Section 303(d)/ Section 305(b) Integrated Report

November 1, 2018

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COVER PHOTO: Lower Charette Lake , May 2016, NMED/SWQB

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Abbreviations and Acronyms

ACWA	Association of Clean Water Administrators
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
CALM	Comprehensive Assessment and Listing Methodology
CFR	Code of Federal Regulations
CPB	Construction Programs Bureau
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
DDT	dichlorodiphenyltrichloroethane
DO	Dissolved Oxygen
DWB	Drinking Water Bureau
DWSRLF	Drinking Water State Revolving Loan Fund
E. coli	*Escherichia coli*
EMNRD	Energy, Minerals, and Natural Resources Department
EPA	Environmental Protection Agency
FY	Fiscal Year
GIS	Geographic Information System
GKM	Gold King Mine
GRTS	Grant Reporting and Tracking System
GWQB	Ground Water Quality Bureau
HP	Hydrology Protocol
HUC	Hydrologic Unit Code
IR	Integrated Report
ISC	Interstate Stream Commission
MASS	Monitoring, Assessment and Standards Section
MCL	Maximum Contaminant Level
MS4	Municipal Separate Storm Sewer Systems
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
NMFA	New Mexico Finance Authority
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
OSE	New Mexico Office of the State Engineer
PCBs	Polychlorinated Biphenyls
PSRS	Point Source Regulation Section
POTW	Publicly Owned Treatment Works
PWS	Public Water System
QA/QC	Quality Assurance/ Quality Control
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
RLWTF	Radioactive Liquid Waste Treatment Facility
RSP	River Stewardship Program
RTCR	Revised Total Coliform Rule
SDWA	Safe Drinking Water Act
SLD	State Laboratory Division
SQUID	Surface water QUality Information Database
SWCD	Soil and Water Conservation District
SWQB	Surface Water Quality Bureau
TMDL	Total Maximum Daily Load
UOC	Utility Operator Certification
USACE	United States Army Corp of Engineers
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
WWTP	Wastewater Treatment Plant

Executive Summary

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 Water Quality Act (WQA) are found in the State of New Mexico Standards for Interstate and Intrastate Surface Waters [20.6.4 NMAC]. Water quality standards are comprised of the designated uses of surface waters of the state, associated water quality criteria necessary to protect these uses, and an antidegradation policy. Designated uses in New Mexico include aquatic life, fish culture, primary and secondary contact (including cultural, religious or ceremonial purposes), public water supply, industrial water supply, domestic water supply, irrigation, livestock watering, and wildlife habitat. 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 process of addressing impairments begins with the identification and reporting of impaired waterbodies (e.g., waterbodies not meeting their designated uses). This report, the State of New Mexico CWA §303(d)/ §305(b) Integrated Report (IR), is designed to fulfill this need as well as satisfy the statutory requirements of §303(d), §305(b), and §314 of the CWA. The IR includes information on primarily surface water quality and water pollution control programs in New Mexico to the United States Environmental Protection Agency (EPA), United States Congress, and stakeholders. The IR is prepared by the New Mexico Environment Department Surface Water Quality Bureau (SWQB) with input from several other NMED bureaus and programs, and is approved by the Water Quality Control Commission (WQCC).

The Canadian and Dry Cimarron River watersheds were surveyed by the SWQB in 2015-2016 and hence are the primary focus of revised or retained assessment conclusions this listing cycle. Additional focus areas based on submitted or acquired datasets include the Pajarito Plateau, San Juan and Animas Rivers with respect to the Gold King Mine 2015 spill, Upper Rio Grande watershed streams sampled by citizen monitoring groups, and the Gallinas River. The assessment conclusions in non-focus areas based on data from previous rotational surveys and previously submitted outside data are typically carried over to the next list until more current data are available to assess unless, for example, a water quality standard change necessitates a re-assessment. Using available data assessed against current designated uses through application of New Mexico's established listing methodologies, the SWQB continues to determine that temperature, nutrient/eutrophication, and E. coli are the three most common causes of river and stream water quality impairment in New Mexico. The three most common causes of water quality impairments in lakes and reservoirs continue to be mercury in fish tissue, PCBs in fish tissue, and temperature.

During development of the IR, impaired waterbodies are further 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) or alternative water quality improvement plan should be scheduled for development. TMDLs and other planning documents provide information on the probable source(s) of the water quality impairment which is used to determine the best approach to improve water quality. Field observations, available GIS layers and land use imagery, and both stakeholder and staff

watershed knowledge are combined to develop draft Probable Source lists which are finalized in TMDL documents and added to subsequent Integrated Lists (Appendix A) and summarized in the IR. The vast majority of surface water quality impairments identified in New Mexico are due to nonpoint sources of water pollution. Agricultural practices (including rangeland grazing), increased runoff from roads and other impervious surfaces, and onsite treatment systems are the leading probable sources of impairment in New Mexico's rivers and streams where TMDLs have been prepared.

The EPA recommends and New Mexico has prepared the 2018-2020 IR consistent with previous guidance memorandums, including EPA's significant 2006 IR Guidance supplemented by subsequent memorandums released for each listing cycle (EPA 2005, 2017a). The 2018 IR is the start of a new approach to reporting that is intended to reduce reporting burden to states, tribes, and territories. Starting with EPA's process improvement event in 2015 (which the SWQB was invited to participate in as one of a handful of states), EPA has worked with states, tribes, and territories to streamline the IR reporting process through updating the system for recording IR data, namely the Assessment and Total Maximum Daily Load Tracking and Implementation System (ATTAINS). The new ATTAINS provides an opportunity for New Mexico to streamline the narrative portion of IR. Accordingly, the main body of the 2018 IR was significantly re-organized and shortened, as compared with previous reports, to better describe New Mexico's current water quality framework and focus on required IR elements that are not reported electronically via ATTAINS. The re-design is also intended to make the IR a more user-friendly document by providing additional hyperlinks to additional information should the user want to learn more about specific programs or restoration activities.

I. Water Quality Identification and Control in New Mexico

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 1978, §§ 74-6-1 to -17] numerous times to improve the management and protection of New Mexico's water resources. The WQA created the New Mexico Water Quality Control Commission (WQCC), and several of the revisions expanded the duties and powers of the WQCC. The WQCC is the State water pollution control agency for all purposes of the federal Clean Water Act (CWA), and may take all necessary actions under the WQA to secure the benefits of the WQA [NMSA 1978, § 74-6-3(E)]. 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." [NMSA 1978, § 74-6-2(H)]. Responsibilities for water quality management activities are assigned by the WQCC to the constituent agencies, primarily the New Mexico Environment Department (NMED). [NMSA 1978, § 74-6-4(F)].

San Juan River near Lions Park

The *State of New Mexico CWA §303(d)/ §305(b) Integrated Report* (Integrated Report or IR) is designed to satisfy the statutory requirements of §303(d), §305(b), and §314 of the CWA. The IR includes 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. The IR is prepared by the NMED Surface Water Quality Bureau (SWQB) with input from several other NMED bureaus and programs, and is approved by the WQCC. The primary focus of the IR is surface water quality, although groundwater is also briefly discussed according to reporting requirements.

The most important component of the IR for surface water pollution identification is the CWA §303(d)/ §305(b) Integrated List, provided as Appendix A. This list details the extent to which surface water quality goals (i.e., designated uses) documented in New Mexico's water quality standards (20.6.4 NMAC) are being met. Designated uses are the desirable, attainable, and existing 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 or more "assessment units" (e.g., stream reaches or waterbodies) for IR 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 (AU) on the Integrated List. New Mexico's IR categories are defined in Table 1. 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 AU is considered "impaired" when one or more pollutants prevent a waterbody from meeting its designated use(s). These pollutants are identified as "cause(s)" on the Integrated List.

Table 1. New Mexico's Integrated Report Categories

Category	Description
1	All designated uses are supported.
2	Available data and/or information indicate that some 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 available).
3B	There are insufficient available data and/or information to make a support determination (only one data point available). Data point does not exceed an applicable water quality criterion.
3C	There are insufficient available data and/or information to make a support determination (only one data point available). Data point exceeds 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. A review of the water quality standard is required to verify the appropriate designated or existing use and/or criterion.
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.
5-ALT	Available data and/or information indicate that at least one designated or existing use is not being supported and an alternative restoration approach is in progress or under development.

Waterbodies classified as Category 5 (e.g., 5A, 5B, 5C, 5-ALT) officially constitute the *CWA §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 EPA recommends and New Mexico has prepared the 2018-2020 IR consistent with previous guidance memorandums, including EPA's significant 2006 IR Guidance supplemented by subsequent memorandums released for each listing cycle (EPA 2005, 2017a). The 2018 IR is the start of a new approach to reporting that is intended to reduce the burden to states, tribes, and territories. Starting with EPA's process improvement event in 2015 (which the SWQB was invited to participate in as one of a handful of states), EPA has worked with states, tribes, and territories to streamline the IR reporting process through updating the system for recording IR data, namely the Assessment and Total Maximum Daily Load Tracking and Implementation System (ATTAINS). The new ATTAINS provided an opportunity for New Mexico to streamline the narrative portion of IR. Accordingly, the main body of the 2018 IR was significantly re-organized and shortened, as compared with previous reports, to better describe New Mexico's current water quality framework and focus on required IR elements that are not reported electronically via ATTAINS. The re-design is also intended to make the IR a more user-friendly document for the users by providing additional hyperlinks to additional information should the user want to learn more about specific programs or restoration activities.

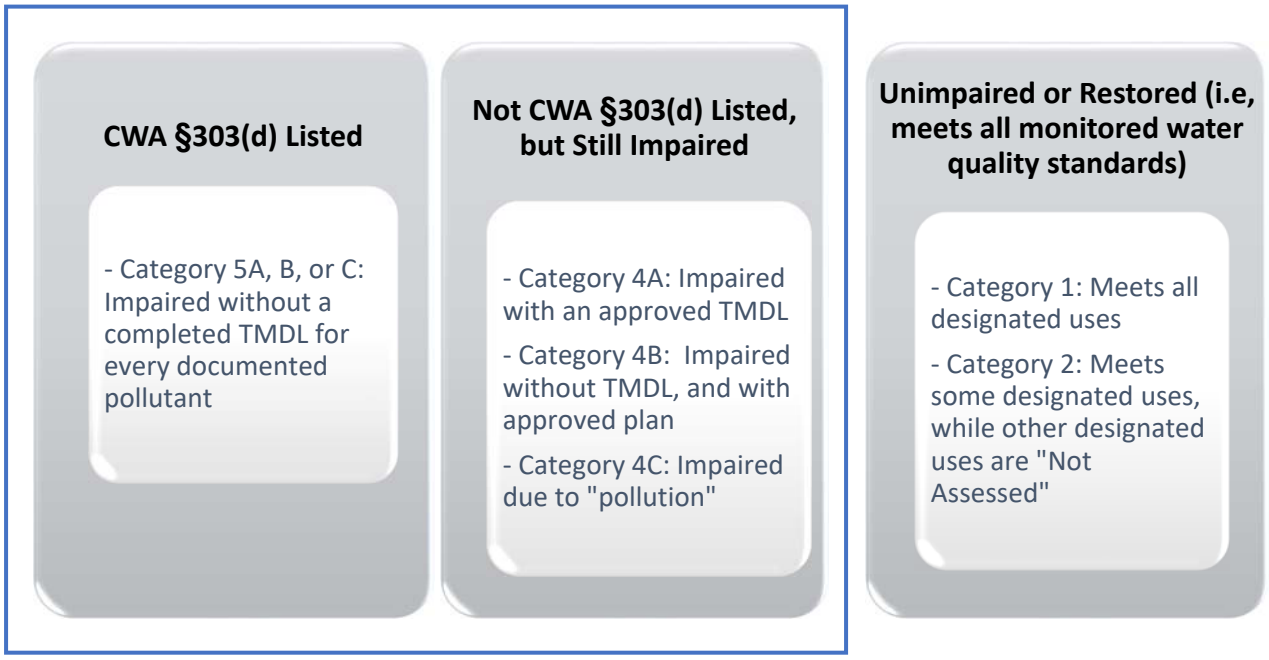

Figure 1. Relationship between CWA §303(d), Impairments, and IR Categories

For additional information on the Clean Water Act §303(d) Listing of Impaired Waters, visit:
https://www.epa.gov/tmdl/program-overview-303d-listing-impaired-waters.

To view this and any of New Mexico's previous CWA §303(d)/§305(b) Integrated Reports, visit:
https://www.env.nm.gov/swqb/303d-305b/.

A. New Mexico's Surface Water Synopsis

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, approximately 34% is federal land, 12% is State land, 10% is Native American land, and 44% is privately owned (BLM 2016). New Mexico in one of the driest states, averaging less than twenty inches annual precipitation which ranges from less than eight inches in desert valleys to over thirty inches in the mountains. Statewide, the annual average precipitation is much less than evaporation from open water surfaces (BOR 1976). 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. Like much of the western U.S., New Mexico continues to experience long-term drought.

Surface water basins include upper portions of several of the region' principal drainage systems: the San Juan River, Little Colorado River and Gila River watersheds contribute to the Lower Colorado River Basin; the Canadian River and Dry Cimarron River watersheds contribute to the Arkansas-White-Red River Basin; and the Rio Grande and Pecos River watersheds contribute discharge to the Rio Grande basin (Figure 2). Other waters of the State in New Mexico include streams that are in topographically closed basins and drain internally (20.6.4 NMAC). Table 2 summarizes water resource information.

The New Mexico Office of the State Engineer (OSE) is charged with administering the state's water resources with respect to quantity. The State Engineer has authority over the supervision, measurement, appropriation, and distribution of all surface and groundwater in New Mexico, including streams and rivers that cross state boundaries. [NMSA 1978, § 72-2-9]. The related Interstate Stream Commission (ISC) has broad powers to investigate, protect, conserve, and develop New Mexico's waters including both interstate and intrastate stream systems. The ISC's authority under state law includes negotiating with other states to settle interstate stream controversies. [NMSA 1978, § 72-14-3]. New Mexico is a party to eight interstate stream basins. To ensure basin compliance, ISC staff analyze, review, and implement projects in New Mexico and analyze streamflow, reservoir, and other data on the stream systems. The ISC is also authorized by statute to investigate and develop the water supplies of the state and institute legal proceedings in the name of the state for planning, conservation, protection and development of public waters. [NMSA 1978, § 72-14-3]. New Mexico has sixteen water planning regions, each with its own water plan. New Mexico's current State Water Plan (OSE/ISC 2003) is under revision with a planned 2018 update. The regional and state water plans are vital tools intended to guide water management in the state to best meet all the state's water users – now and into the future.

For additional information on New Mexico's OSE/ISC, visit: http://www.ose.state.nm.us/

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

Topic	Value
State population[1]	2,088,070
State Surface Area	121,607 mi^2
Total miles of perennial non-tribal rivers / streams[2]	6,362 miles
Total miles of non-perennial non-tribal river / streams[2,3]	88,810 miles
Number of significant public lakes/reservoirs[4]	196
Acres of significant public lakes/reservoirs[2,4]	89,042 acres
Acres of freshwater wetlands[5]	845,213 acres

[1] United States Census Bureau July 1, 2017, 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). Includes both public and private non-tribal stream miles.

[3] Flowline segments assigned FCode 46003 (intermittent) and 46007 (ephemeral) in NHD were tallied to determine total non-perennial mileage. Assessment Units in NM's Integrated List (Appendix A) include a subset of the overall non-perennial stream mileage, typically waters with permits or other significant land use concerns.

[4] 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.

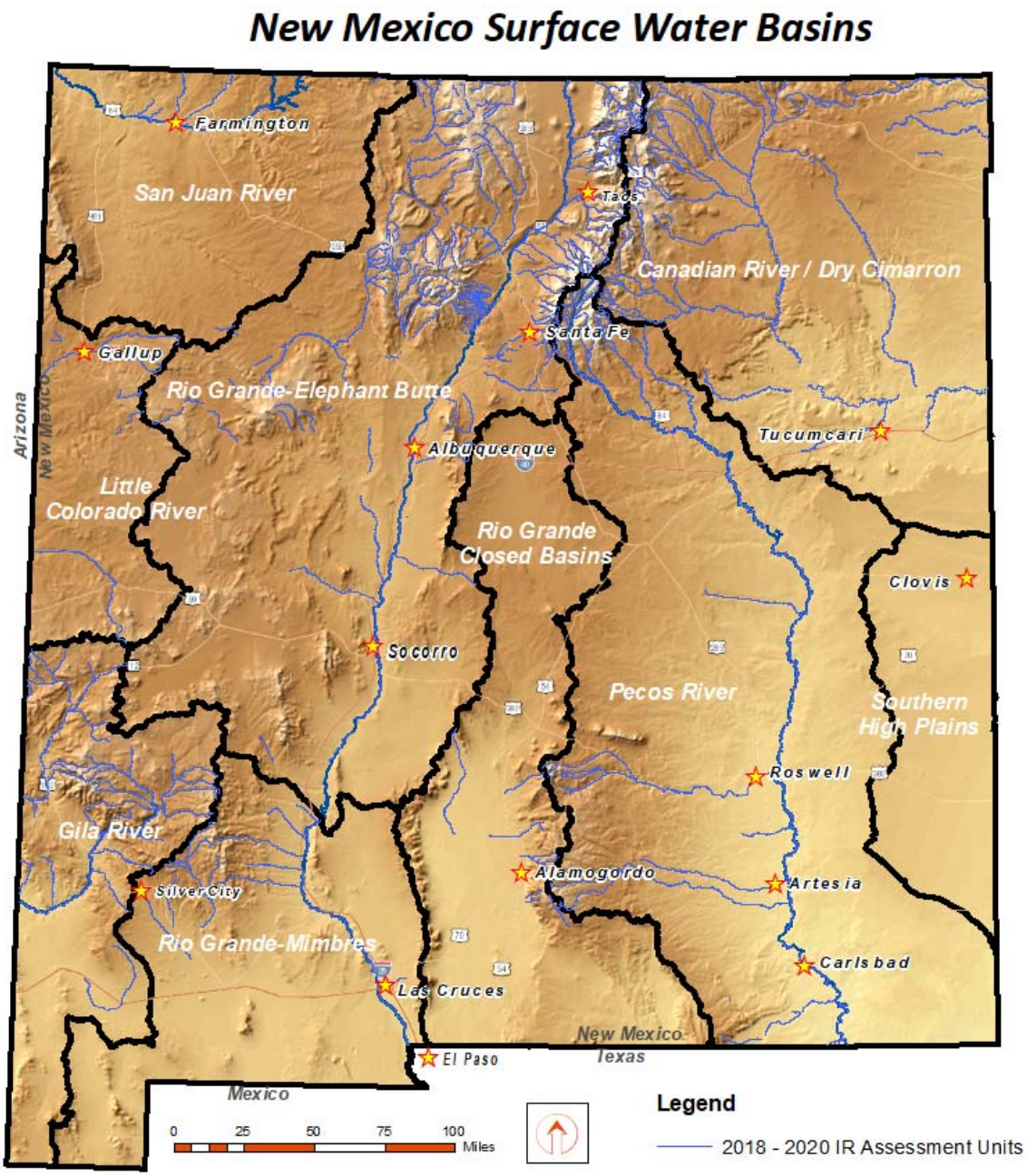


Figure 2. New Mexico Surface Water Basins

B. New Mexico's Surface Water Quality Framework

Under the authority of the WQA and the CWA, the SWQB developed and the WQCC has adopted the basic framework for water quality management in New Mexico as described in the *State of New Mexico Statewide Water Quality Management Plan/Continuing Planning Process* (WQMP/CPP) (WQCC 2011). The SWQB prepares and maintains the WQMP/CPP, and a revision is under development for 2018. The SWQB uses this integrated planning and management strategy to protect or attain the desired uses and levels of surface water quality within a waterbody. 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 3. 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) and other planning documents which help guide National Pollutant Discharge Elimination System (NPDES) permit limits and CWA §319 restoration projects to help a waterbody achieve water quality standards. Progress in then measured, and water quality goals and approaches are updated accordingly. The sections below provide greater details on each component and associated programs and approaches.

For additional information on New Mexico's WQMP/CPP, visit:
https://www.env.nm.gov/swqb/documents/swqbdocs/WQMP-CPP/WQMP-CPP-December2011.pdf.

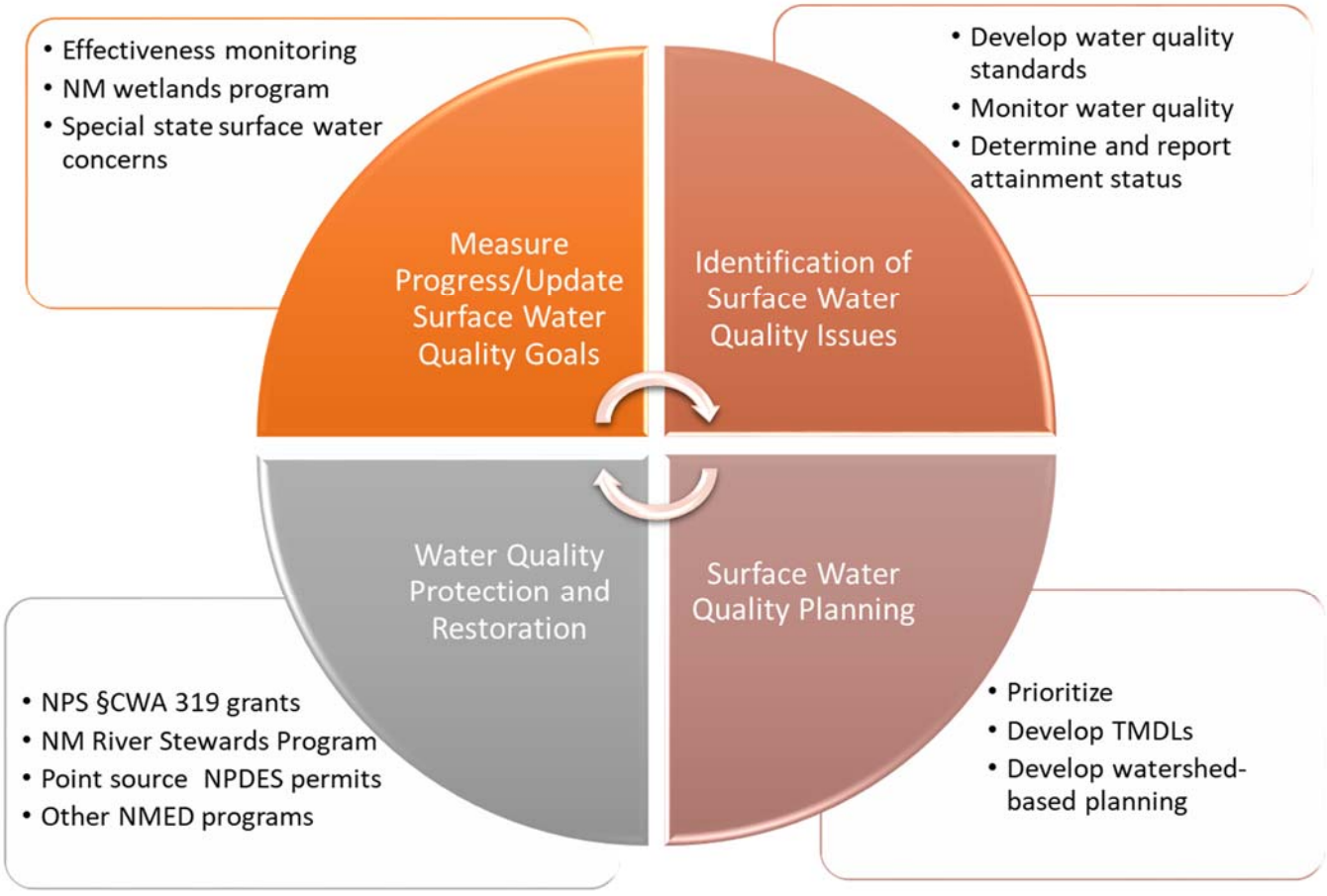


Figure 3. General Framework for Identifying and Restoring New Mexico's Surface Waters

II. Identification of Surface Water Quality Issues

A. Develop Water Quality Standards

The first step to identify surface water quality issues is to set surface water quality goals through the development and maintenance of New Mexico's surface water quality standards (20.6.4 NMAC). The SWQB's Surface Water Quality Standards (WQS) 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.

Field sampling for basic parameters

In accordance with CWA §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 the most recent 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 triennial review proposals for WQS changes to the WQCC in a public hearing held from October 13-16, 2015. The WQCC deliberated and issued a final order and statement of reasons on January 10, 2017. These changes were submitted to EPA for final approval under CWA §303(c) and EPA provided approval of the standards applicable to the Clean Water Act effective August 11, 2017. WQS changes approved by the WQCC included:

- A new temporary standards provision under 20.6.4.10.F NMAC;
- Updates to 20.6.4.16 NMAC to clarify requirements for piscicide applications that are covered under EPA's NPDES program, and to ensure public involvement for applications that are not covered under EPA's NPDES program;
- Listing of ephemeral waters under 20.6.4.97 NMAC pursuant to 20.6.4.15.C NMAC;
- Revisions to aquatic life uses in the San Juan River and Mimbres River basins under 20.6.4.403, 404, 803, and 804 NMAC;
- New Smelter Tailing Soils Investigation Unit-related standards in the Mimbres Basin under 20.6.4.808 and 809 NMAC; and
- Clarifications of criteria applicability, updates to methods, and corrections of grammatical errors.

While EPA provided comment on all changes to New Mexico's WQS, the areas in which EPA took no action included changes to the Planned Use of a Piscicide [20.6.4.16 NMAC], as this is a non-regulatory requirement; and the mine-related standards in the Mimbres Basin [20.6.4.808 NMAC and 20.6.4.809 NMAC], which included segment-specific copper criteria for ephemeral and intermittent-perennial waters. Even though these changes are not in effect for Clean Water Act purposes, they are effective under New Mexico law.

For more information on New Mexico's surface water quality standards, visit:
https://www.env.nm.gov/surface-water-quality/wqs/

B. Monitor Water Quality

The second step to identify surface water quality issues is to collect water quality data and information through organized, quality-controlled monitoring. The purpose of SWQB's Monitoring Program is to ensure relevant water quality data for all of New Mexico's surface waters are collected with the most robust scientific methods in a way that is transparent to water quality agencies and the public. The Monitoring Program serves all surface water quality monitoring needs to the extent possible given available resources, NMED priorities, and strategic goals. The waterbody types currently monitored by the program include streams, rivers, lakes, and reservoirs.

Clear goals and objectives are required to implement an effective monitoring program. To meet federal and state requirements and expectations, the SWQB has developed a monitoring strategy per EPA Guidance (EPA 2003b, NMED/SWQB 2016a). The strategy provides a detailed description of SWQB's monitoring objectives and designs, as well as approaches to data quality assurance and management. Key topics are briefly discussed below.

1. Monitoring design

Like several other states, New Mexico utilizes a targeted, rotational watershed approach to ambient water quality monitoring. Watershed surveys are developed through establishment of targeted sampling sites throughout a watershed of interest. Monitoring staff develop and implement field sampling plans to ensure all necessary chemical, biological, and physical data needed to determine attainment of New Mexico's water quality standards are collected during the survey. Pre- and post-survey planning meetings are held with other SWQB personnel working on point source and nonpoint source issues as well as TMDL development in the watershed. The current 8-year rotational monitoring schedule is shown in Figure 4.

Preparing for biological sampling on Rio Grande

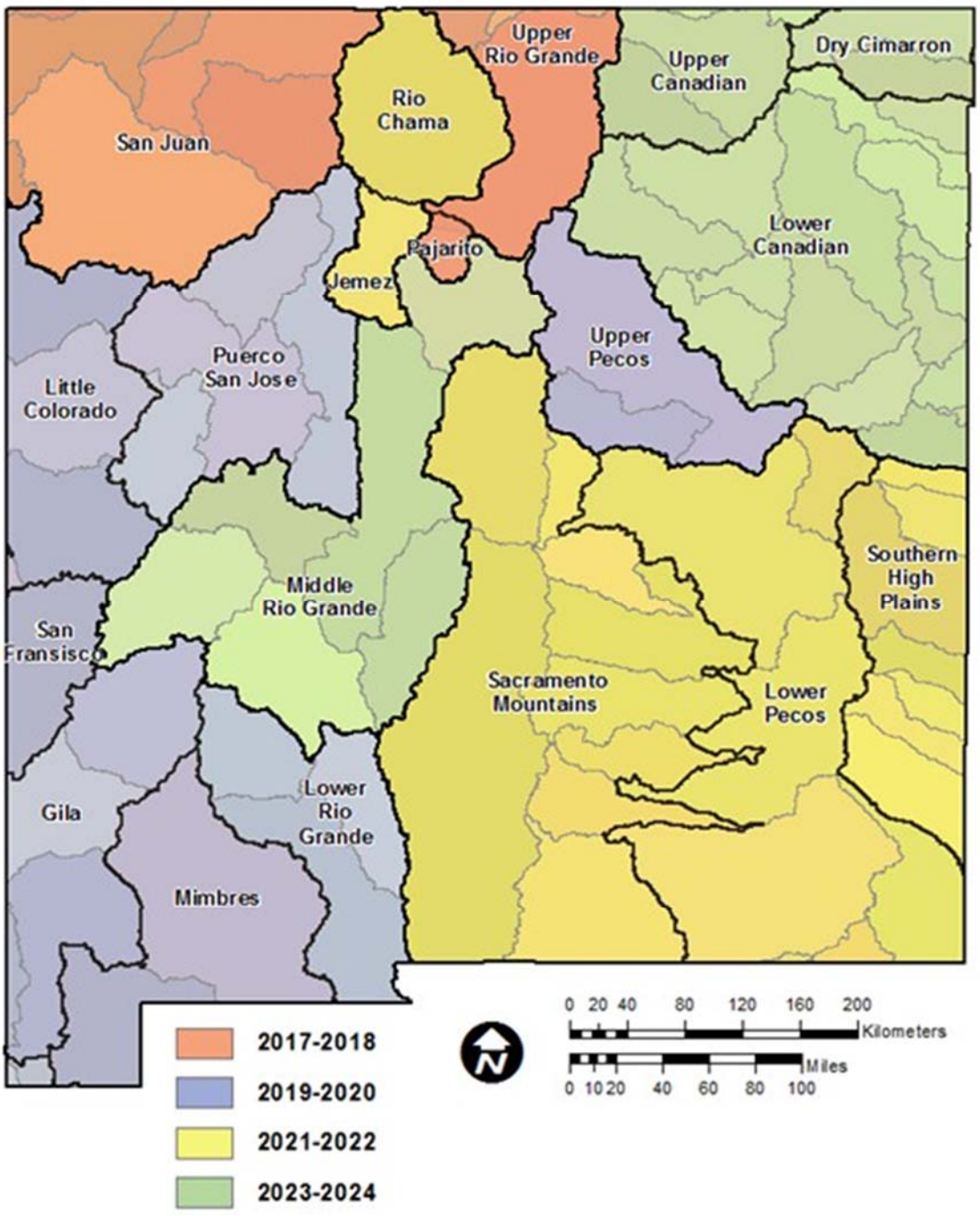


Figure 4. New Mexico's Surface Water Quality Monitoring Schedule (from NMED/SWQB 2016a)

For survey years 2015-2016, the SWQB conducted a two-year survey of the Canadian River and Dry Cimarron River basins, covering the northwest portion of the state. The data and information gathered during this survey are the focus of the 2018-2020 IR attainment determinations in Appendix A. The SWQB is implementing a two-year survey of the Upper Rio Grande and San Juan River basins for survey years 2017-2018, which will be the focus of the subsequent 2020-2022 IR.

To review New Mexico's 10-Year Monitoring Strategy, visit:
https://www.env.nm.gov/surface-water-quality/protocols-and-planning/

CWA §314 requires an assessment of "significant" publicly-owned lakes. New Mexico has identified 197 significant publicly-owned lakes, reservoirs, and playas that cover approximately 89,041 acres on the Integrated List (Appendix A). Lake monitoring is incorporated into the rotational, targeted survey design. The SWQB has determined the list of significant publicly-owned lakes, reservoirs, and playas using the following criteria:

- Lakes and reservoirs over 20 acres because of their many and varied uses,
- Lakes and reservoirs smaller than 20 acres where fish kills or pollutants threaten designated use attainment,
- Various playa lakes in New Mexico because of 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 (NOTE: Difficult access often restricts sampling efforts at these lakes.)

Water quality sampling on Santa Cruz Lake

EPA has encouraged states to incorporate probabilistic sampling designs into their monitoring programs to enable them to generate statistically-based conclusions regarding the overall state of water quality. Accordingly, many states have begun to incorporate probabilistic monitoring into their core monitoring strategies. 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 waterbodies are impaired or where to target CWA §319 watershed restoration funds, and do not provide the targeted data necessary for TMDL development. In addition, 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. 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, the SWQB considers the targeted approach to be the most appropriate to meet New Mexico's monitoring objectives. For example, the SWQB has sampled nearly all of New Mexico's perennial waters during its watershed surveys. To date, approximately 85% of all identified perennial stream miles have been assessed, and 98% of identified perennial public lake acres have been assessed, including all of New Mexico's large mainstem reservoirs. The targeted approach has proven effective at fulfilling monitoring objectives and allowing for summary conclusions to be drawn about the status of the State's waters. EPA's National Aquatic Resources Survey (NARS) 2013-2014 rivers and streams summary report and data were still provisional at the time this IR was drafted (February 2018). The 2020-2022 IR will include a summary of EPA's NARS 2013-2014 rivers and streams conclusions with respect to New Mexico (see New Mexico's 2014-2016 Integrated Report at https://www.env.nm.gov/swqb/303d-305b/2014-2016/index.html, Section C.5, for a discussion of EPA's 2008-2009 survey results).

2. *Quality assurance*

The SWQB is committed to maintaining a quality assurance program that ensures 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 (NMED/SWQB 2018).

All data collected by the SWQB for water quality attainment determinations are collected and analyzed following established standard operating procedures (SOPs) (NMED/SWQB various dates). In addition, all data are handled in accordance with the most current version of the EPA-approved Quality Assurance Project Plan (QAPP) (NMED/SWQB 2016b). 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 tasks 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 the SWQB to utilize data collected by outside agencies or stakeholder groups, a review of quality assurance procedures for submitted data is conducted to ensure that data are of equal or greater quality to those collected by the SWQB under the QAPP.

To review New Mexico's QMP, QAPP, and various SOPs, visit:
https://www.env.nm.gov/surface-water-quality/protocols-and-planning/

3. *Data management and survey reporting*

The SWQB's in-house Surface Water Quality Information Database (SQUID) is an integral tool for coordinated storing, assessing, and reporting of water quality data and conclusions between SWQB programs, to EPA, and to New Mexico's stakeholders. This Oracle© database, developed and maintained by NMED's Information Technology Bureau, allows for required electronic reporting of monitoring data to EPA's water quality exchange (WQX) database and WQS attainment conclusions to EPA's ATTAINS database. SQUID also contains many survey planning and tracking tools and reports. SQUID has been updated to be compatible with EPA's newly-redesigned ATTAINS database per EPA guidance (EPA 2017a).

Following the completion of each rotational watershed survey, SWQB monitoring staff prepare water quality survey reports. These sampling summary reports are an update to the associated original field sampling plan, detailing the monitoring goals that were accomplished during the survey as well as any deviations from the original monitoring plan.

To access SWQB's field sampling plans and survey reports, visit:
https://www.env.nm.gov/surface-water-quality/water-quality-monitoring/

C. Determine and Report Attainment Status

The third step to identify surface water quality issues is to compare collated water quality data to current water quality standards using consistent, documented processes. New Mexico's listing methodology is described in the Comprehensive Assessment and Listing Methodology (CALM) (NMED/SWQB 2017a). This document explains how the SWQB evaluates surface water quality data and other information to determine whether or not surface water quality standards are being met as documented in Appendix A. The listing methodologies described in the CALM are reviewed each odd-numbered year to ensure the methods are clearly defined and consistent with applicable water quality standards, and to incorporate relevant new EPA guidance. For the 2018-2020 reporting cycle, enhancements included a major revision to the nutrient assessment protocols for perennial, wadeable streams based on completion of the Nutrient Scientific Technical Exchange Partnership and Support (N-STEPS) project with EPA Office of Water and EPA Region 6 (Jessup et. al 2015).

To review New Mexico's listing methodologies (CALM), visit: https://www.env.nm.gov/surface-water-quality/calm/. **For additional information on nutrient threshold development, visit**: https://www.env.nm.gov/swqb/Nutrients/.

Outside sources of data are solicited and acquired via a public notice process prior to developing the draft IR and associated Integrated List (Appendix A). Simultaneously, the revised CALM is public noticed to solicit input into New Mexico's listing methodologies. In general, all readily-available data less than five years old that have been reviewed and accepted 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 are given a lower priority in assessment than newer data, particularly if newer data indicate a change in water quality or the older data fail to meet data quality requirements. Provisional data are not used to make designated use support determinations.

Common surface water quality data sources collated to determine use impairment in New Mexico include, but are not limited to, the following:

- SWQB chemical/physical, biological, habitat, or bacteriological data collected during rotational watershed surveys;
- Chemical/physical, biological, habitat, or bacteriological data from SWQB studies or projects collected by SWQB staff or their cooperators;
- SWQB Effectiveness Monitoring data;
- USGS chemical/physical, biological, habitat, or bacteriological data;
- Los Alamos area environmental data publicly-available for download from *Intellus New Mexico* (http://www.intellusnmdata.com/); and
- Citizen or volunteer monitoring data.

For additional information regarding SWQB's data submittal process, visit: https://www.env.nm.gov/swqb/DataSubmittals/

The Canadian and Dry Cimarron River watersheds were surveyed by the SWQB in 2015-2016 and hence are the focus of revised or retained assessment conclusions in Appendix A and the associated assessment rationale of this IR. Other datasets that were either submitted or acquired this cycle and assessed as reported in Appendix A and the assessment rationale include:

- 2015-2017 EPA-collated Gold King Mine dataset,
- 2012-2017 Pajarito Plateau data collected by Los Alamos National Laboratory staff and contractors,
- 2014-2016 data for various stream reaches in and around Taos and Red River collected by Sentinels-Rio de Taos and submitted by Amigos Bravos, and
- 2015 data collected and submitted by the Hermit's Peak Watershed Alliance.

The assessment conclusions in non-focus areas based on data from previous rotational surveys and previously submitted outside data are typically carried over to the next list until more current data are available to assess unless, for example, a water quality standard change necessitates a re-assessment. This was the case with several historic dissolved aluminum listings with concurrent pH > 6.5 because the previous dissolved aluminum criteria are no longer applicable in these waterbodies (NMED/SWQB 2017a).

New Mexico maintains assessment information in SQUID, and uploads this information to ATTAINS per EPA guidance (EPA 2017a). Use of SQUID allows SWQB to automatically generate the entire Integrated List (Appendix A), the associated assessment rationale, the official CWA §303(d) List of Impaired Waters, as well as a variety of summary reports. The SWQB maintains an extensive web site that provides access to all past and current CWA §303(d)/ §305(b) reports and supporting information.

To access past and current CWA §303(d)/ §305(b) reports and supporting information, visit:
https://www.env.nm.gov/swqb/303d-305b/.

The assessment rationale document (formerly known as the "record of decision" or ROD) 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 specific document and does not take action to approve or disapprove its contents. The assessment rationale was originally created as a separate word processing document. All assessment units (AUs) do not have detailed assessment rationale entries because prior to the 2018-2020 IR, the assessment rationale generally did not contain entries on AUs that have not been assessed or have never been found to be impaired. The assessment rationale is now a database field in SQUID, making it easier to provide assessment notes by IR cycle on all AUs being assessed. Assessment rationale entries by IR cycle, starting with the 2018-2020 IR, are also uploaded to EPA's ATTAINS database.

All AUs are assigned IR categories as described in New Mexico's CALM (NMED/SWQB 2017a). Assessment units noted with IR Category 5A, 5B, or 5C on the Integrated List in Appendix A comprise New Mexico's official CWA §303(d) List of Impaired Waters. A listing of Category 5-only waters is included in the beginning of Appendix A. To see details on a specific AU, refer to the particular AU entry on the full Integrated List in Appendix A and associated assessment rationale entry. Starting with the 2018-2020 IR, each AU entry on the Integrated List now also contains a "PARAMETER IR CATEGORY." This useful field provides additional planning information regarding each particular cause of impairment or AU_cause pair. For example, a parameter IR category of 5B lets the user know that a review of the applicable water quality standard is

needed prior to scheduling TMDL development. New Mexico has several temperature listings that fall under the 5B parameter IR category.

New Mexico's Integrated List also includes an estimated year in the "TMDL DATE" field for all parameter IR category 5A AU_cause pairs. The estimated year is generally based on the SWQB's rotational monitoring schedule, prioritization strategy in the SWQB's long-term vision document (NMED/SWQB 2015), and severity of the impairment. The "TMDL DATE", as well as the projected "MONITORING SCHEDULE" year, is ultimately dependent upon personnel and financial resources which can change on an annual basis. If a TMDL has already been developed for the noted cause of impairment, the EPA TMDL approval date (MM/DD/YYYY) is reported in the TMDL date field.

The causes of impairments are summarized by major waterbody type (rivers/streams vs. lakes/reservoirs) in the section below.

1. River and Stream Assessment Results

New Mexico's surface waters are assigned to one of the IR categories defined in Table 1 and summarized in Table 3. Individual IR categories for every AU are provided in the Integrated List (Appendix A).

The largest grouping of assessed lotic (i.e., flowing) waters are IR Category 5. These AUs, along with the Category 5 lake/reservoir waterbodies, comprise New Mexico's official CWA §303(d) list of impaired waters. A list of Category 5-only waters was generated from SQUID and is included in the beginning of Appendix A.

Table 3. Integrated Report Categories for New Mexico's Rivers and Streams

IR Category	Total Size (miles)	Number of River/Stream Assessment Units
1	1,060	79
2	1,099	116
3A	1,575	132
3C	10	2
4A	927	74
4C	226	18
5A	1,470	95
5B	585	52
5C	883	74
TOTAL	**7,835**	**642**

NOTE: This information was generated using SQUID.

IR Category 4A represents stream reaches where TMDL planning documents have been developed for all documented causes of impairment in a particular AU. These AUs are technically still impaired (see Figure 1) even though they are not officially considered to be part of the Clean Water Act §303(d) list by EPA. Several of these stream reaches also have TMDLs for more than one parameter.

Assessment units are listed in IR Category 1 and 2 if there are sufficient data and information meeting the requirements of the assessment and listing methodology that can be used to support a determination that some or all uses are attained based on numeric and narrative water quality criteria that were evaluated.

Assessment units are listed in IR Category 3 when data to support an attainment determination for any designated use are not available according to the requirements of the 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. The SWQB prioritizes IR Category 3 AUs during rotational survey planning.

A summary of the river/stream attainment status for each designated use, as found in New Mexico's WQS (20.6.4 NMAC), is presented in Table 4. In New Mexico, the CWA goal of "fishable" is reported under the various aquatic life uses while the "swimmable" goal is reported under primary and secondary contact uses.

Table 4. 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	854.7	647.5	172.2	475.3	207.1
Coolwater Aquatic Life	293.6	232.2	33.1	199.1	61.4
High Quality Coldwater Aquatic Life	2539.2	2309.4	870.0	1439.4	229.8
Limited Aquatic Life	195.1	98.5	25.7	72.8	96.6
Marginal Coldwater Aquatic Life	972.3	881.3	292.9	588.4	91.0
Marginal Warmwater Aquatic Life	2308.1	1343.0	664.5	678.5	965.1
Warmwater Aquatic Life	1731.3	1391.4	915.0	476.4	339.9
Primary Contact	6937.4	4528.8	3465.7	1063.1	2408.6
Secondary Contact	902.2	592.8	566.9	25.9	309.4
Domestic Water Supply	2669.2	2220.4	2202.8	17.6	448.9
Irrigation	6317.3	5322.4	5227.6	94.8	994.8
Livestock Watering	7839.6	5484.3	5366.4	117.9	2355.3
Wildlife Habitat	7839.6	5779.3	5574.2	205.0	2060.3
Fish Culture*	1264.6	--	--	--	1264.6
Industrial Water Supply*	423.6	--	--	--	423.6
Public Water Supply*	740.7	--	--	--	740.7

* = 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.A NMAC.

The leading impairment causes for New Mexico’s rivers and streams are presented in Figure 5. 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 listing methodologies. Dissolved oxygen (DO) and nutrient/eutrophication impairments may be redundant in some cases, as DO impairment is often a response resulting from excessive nutrients.

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.

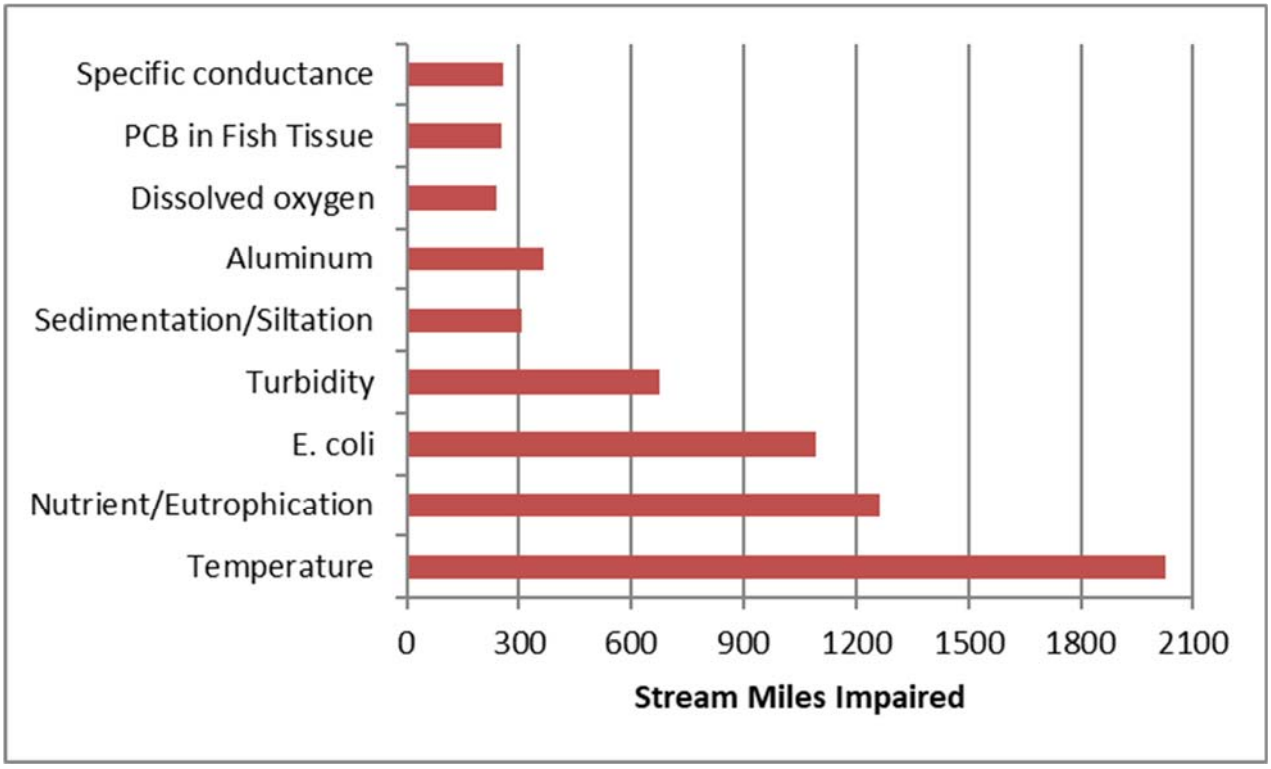


Figure 5. Top Causes of Surface Water Impairment for Rivers and Streams

2. *Lake and Reservoir Assessment Results*

One major challenge regarding both lake monitoring and lake TMDL development has been the loss of specific CWA §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 §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 5. Integrated Report Categories for New Mexico's Lakes and Reservoirs

Category	Total Size (acres)	Number of Assessment Units
1	691	12
2	9,003	18
3A	20,661	124
5A	20,816	21
5B	302	3
5C	37,569	18
TOTAL	**89,042**	**196**

NOTE: This information was generated using SQUID.

Table 5 shows the number of New Mexico's lakes and reservoirs assigned to each IR category as defined in Table 1. Individual IR categories are presented for every AU on the Integrated List in Appendix A.

By acreage, the majority of assessed lentic (i.e., not flowing) AUs in New Mexico fall under Category 5. 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 in-line and off-line reservoirs. These AUs, along with the IR Category 5 river/stream AUs, comprise New Mexico's official CWA §303(d) list of impaired 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.

Assessment units are listed in IR Category 3 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. The 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 §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 2017a).

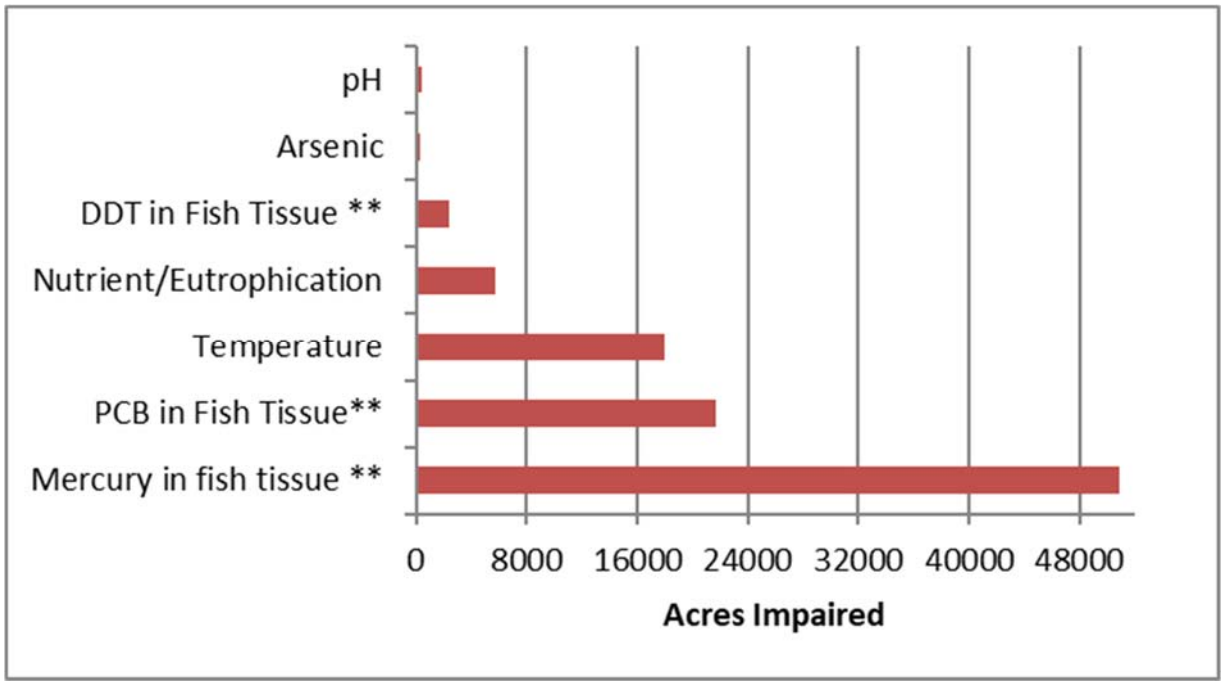
A summary of the lake/reservoir attainment status for each designated use, as found in New Mexico's WQS (20.6.4 NMAC), is presented in Table 6. Similar to rivers/streams, the CWA goal of "fishable" is reported under the various aquatic life uses while the "swimmable" goal is reported under primary and secondary contact uses.

Table 6. 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	24716.5	24629.5	3221.9	21407.6	87.0
Coolwater Aquatic Life	5686.1	789.0	0.0	789.0	4897.2
High Quality Coldwater Aquatic Life	1910.9	1627.3	56.5	1570.8	283.6
Marginal Coldwater Aquatic Life	439.2	313.2	313.2	0.0	126.0
Marginal Warmwater Aquatic Life	28535.0	4843.0	11.2	4831.9	23692.0
Warmwater Aquatic Life	48623.1	47417.1	14625.4	32791.6	1206.1
Primary Contact	87703.1	61053.6	61053.6	0.0	26649.5
Secondary Contact	1336.2	487.6	487.6	0.0	848.5
Domestic Water Supply	2519.5	2236.0	2236.0	0.0	283.6
Irrigation	8860.2	8290.8	8290.8	0.0	569.5
Irrigation Storage	48400.9	48400.9	48400.9	0.0	0.0
Livestock Watering	89016.4	62824.5	62824.5	0.0	26191.9
Wildlife Habitat	89039.2	68378.9	68378.9	0.0	20660.3
Fish Culture*	41.5	--	--	--	41.5
Industrial Water Supply*	16770.9	--	--	--	16770.9
Public Water Supply*	36269.5	--	--	--	36269.5

* = 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.A NMAC.

A summary of the impairment causes for New Mexico's lakes and reservoirs is presented in Figure 6. 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.



NOTES: **Based on current fish consumption advisories and 0.3 mg/kg methylmercury in fish tissue criterion (see NMED/SWQB 2017a).

Figure 6. Top Causes of Surface Water Impairment for Lakes and Reservoirs

Mercury in fish tissue, 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 listing methodologies (NMED/SWQB 2017a). 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 §101(a), EPA 2005). New Mexico currently has fish consumption advisories based on mercury, DDT, and PCB levels in fish tissue (NMDOH *et al*. 2016). 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.

III. Surface Water Quality Planning

A. Prioritize Impairments and Concerns

After water quality impairments and issues are identified, New Mexico engages in water quality planning to address the concern. The first surface water quality planning step is to prioritize impairment listings for subsequent TMDL development or alternative plans in order to implement restoration strategies with a more holistic approach. The SWQB continues to be involved in national conversations with EPA and the Association of Clean Water Administrators (ACWA) regarding the Long-Term Vision for the CWA 303(d) Program. The goals of the 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 Vision and goals, the TMDL program in New Mexico is focusing on state water quality priorities, while continuing to evaluate TMDL alternatives and protection of 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 then incorporated in the SWQB's long-term prioritization document (NMED/SWQB 2015). This guidance document is used by the SWQB for monitoring and TMDL planning; it is not a static document and will be updated during the 2018-2022 timeframe, if necessary. The list of TMDL priorities through 2022 were determined using the process outlined in the Prioritization Framework and were provided to EPA Region 6 in July 2015. 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.

To review the SWQB's prioritization framework, visit:
https://www.env.nm.gov/surface-water-quality/tmdl/.

B. Develop Total Maximum Daily Loads

CWA §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." A TMDL is defined as the "calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet and continue to meet water quality standards for that particular pollutant. A TMDL determines a pollutant reduction target and allocates load reductions necessary to the source(s) of the pollutant."[1]

To accomplish this 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 a 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 and incorporated by reference (WQCC 2011). TMDLs also inform the EPA in developing effluent

[1] https://www.epa.gov/tmdl/program-overview-total-maximum-daily-loads-tmdl

limits for NPDES permits and help guide SWQB in prioritizing watershed protection and restoration projects funded under the CWA §319 and other programs.

Since the previous listing cycle, New Mexico has completed and both the WQCC and EPA have approved TMDLs for the Jemez River (15), Lower Pecos River (2), Rio Ruidoso (6), Upper Rio Puerco (5), Galisteo Creek (2), Santa Fe River (3), and Tijeras Arroyo (2). EPA approval is pending for updated aluminum TMDLs for the Middle Rio Grande (1) and Jemez River (2). SWQB also received EPA approval to remove a dissolved aluminum TMDL for Cieneguilla Creek. EPA approval for additional removals for Rio Chamita, Rio Puerco, and Whitewater Creek are pending.

For more information on SWQB's TMDL program and to access individual approved TMDL planning documents, visit: https://www.env.nm.gov/surface-water-quality/tmdl/**.**

TMDLs include a list of "probable sources" in the contributing watershed. These are defined as activities that may contribute pollutants or stressors to a waterbody (EPA 1997). The probable source list included with any cause of impairment includes any and all activities occurring or likely to occur in the watershed that have the potential to contribute 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 waterbody have not been proven to be a source or the only sources of the identified impairment. The list is based on qualitative field observations made by field staff for AUs 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. Specifically, Probable Source Sheets are first drafted during rotational watershed surveys and watershed restoration activities by SWQB staff. Information gathered from the Probable Source Sheets are used to generate a draft Probable Source list in consequent draft TMDL planning documents. These draft Probable Source lists are 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 maintains a standard operating procedure for this topic.

As part of the ATTAINS re-design, there were several discussions between EPA and states regarding the reporting of probable sources since most states do not have dedicated funding for source identification. EPA Office of Water staff confirmed that probable sources for impaired AUs (i.e., IR Category 4 and 5) are an optional data element and not required in the new ATTAINs system. Therefore, New Mexico is no longer reporting "Source Unknown" for AU_cause pairs without approved TMDLs. As stated above, documenting probable sources is part of the TMDL process in New Mexico as opposed to the listing process. Accordingly, probable sources have also been removed from the Integrated List (Appendix A). However, the SWQB does maintain probable sources documented in approved TMDLs in SQUID in order to provide a summary discussion of the primary sources of impairment in New Mexico. This fulfills the CWA §305(b)(1)(E) requirement to provide "a description of the nature and extent of nonpoint sources of pollutants."

A summary of the top impairment sources as documented in approved TMDLs for New Mexico's rivers and streams is presented in Figure 7. 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. In most instances, more than a single probable source contributes to water quality impairment. The total mileage values reported are summations

of AU mileages for all AU_impairment pairs assigned to each probable source. Since the State has not yet written any lake or reservoir TMDLS, a probable sources summary is not available for this water type but it is assumed to be similar.

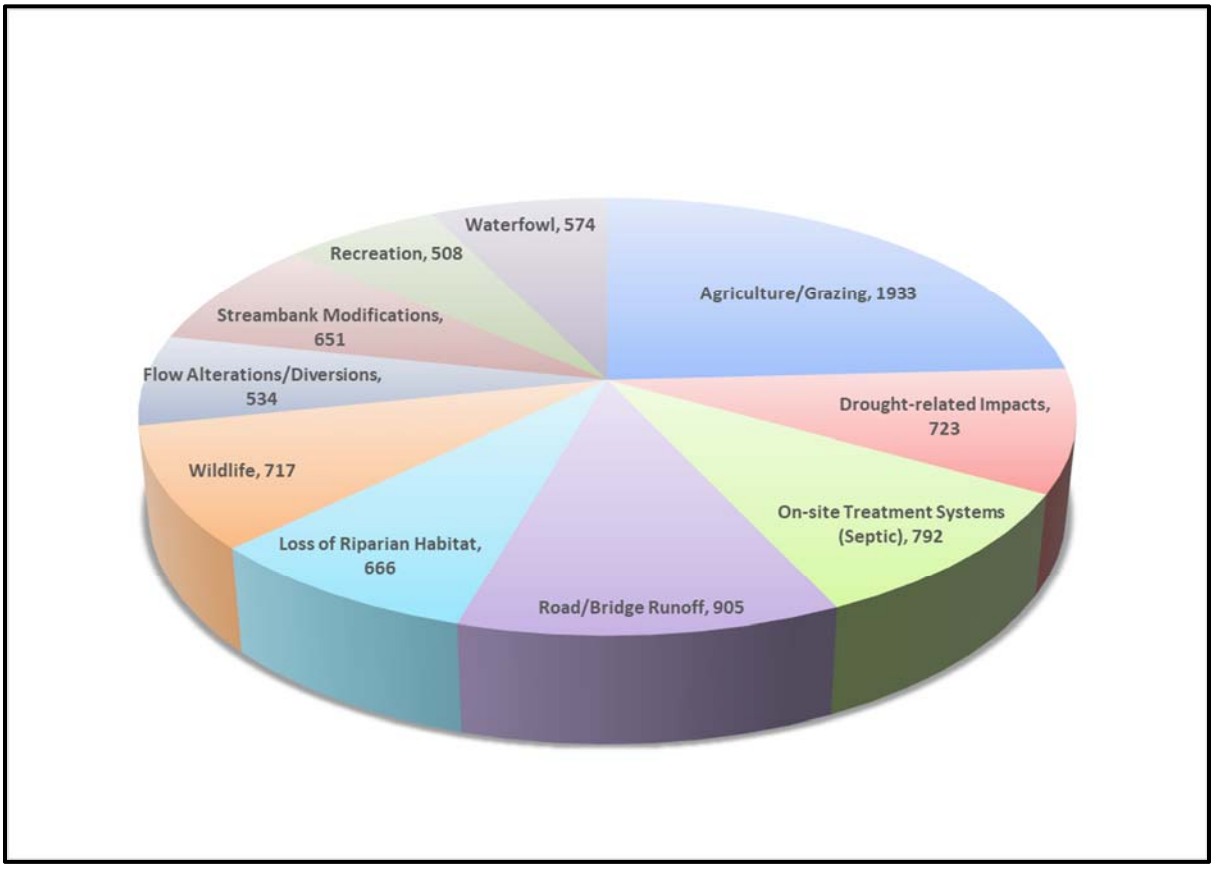
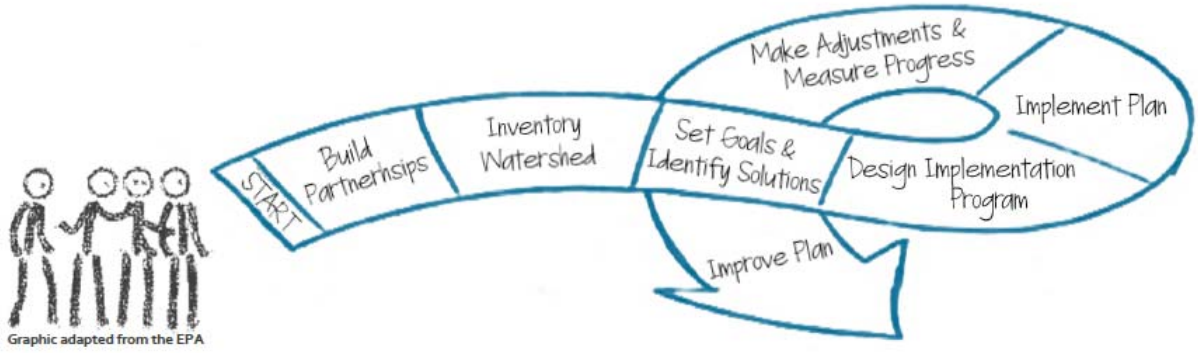


Figure 7. Top Probable Sources of Surface Water Impairment in Rivers/Streams as reported in approved TMDLs (total AU-impairment pair mileage shown)

As seen in the summary graphic, the majority of water quality impairments identified in New Mexico's streams and rivers continues to be due to nonpoint sources (NPS) of water pollution. 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/streams, lake/reservoirs, wetlands, and ground water.

C. Develop Watershed-Based Plans

As mentioned, the Vision promoted by EPA encourages states to consider alternatives to TMDLs when other planning approaches are more appropriate or can lead to quicker on-the-ground results. One viable method is an increased emphasis on watershed-based plans (WBPs).



New Mexico's NPS Management Program is designed as a cooperative effort among federal and state agencies, watershed stakeholders, and NMED's SWQB Watershed Protection Section (WPS). The current plan for the NPS Management Program was developed in 2014 and approved by EPA in early 2015 (NMED/SWQB 2014a), and a draft revised plan is under development in 2018. The current plan states 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 watershed-based 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).

A WBP is a comprehensive report written to address water quality problems for watersheds with impaired streams. It generally includes several elements to encourage effective implementation and adaptive evaluation. The SWQB encourages use of a WBP by any watershed restoration program to benefit water quality. WBPs are used by local watershed groups and other interested stakeholders to build on the TMDL process, if available, with more detailed characterization of pollutant sources, management measures, information and education programs, and monitoring. This approach facilitates coordinated watershed restoration efforts, the development of effective watershed associations, engaged stakeholders, and the implementation of effective BMPs to reduce NPS pollution. Table 7 provides some examples of BMPs encouraged by the Program. NMED underscored its encouragement by making watershed-based planning a requirement for significant restoration activities to be funded with CWA §319(h) funds. New Mexico's current and recently completed watershed-based planning projects are displayed on Figure 8 and in Appendix D.

Information on watershed-based planning, as well as WBPs that have been reviewed and accepted by EPA, are available at: https://www.env.nm.gov/surface-water-quality/wbp/**.**

Table 7. Common BMPs Implemented Throughout New Mexico to address Nonpoint Source Pollution

NPS Pollution Category	Examples of Best Management Practices (BMPs) utilized in New Mexico
Agriculture	• Residue Management (contour strip cropping, stubble munching, conservation tillage) • Improved irrigation practices (low output sprinklers, vegetation control) • Nutrient Management (split fertilizer applications, nutrient balancing, crop rotation)
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
Fire Suppression/Fuels Management	• Forest thinning / fuels reduction • Post wildfire watershed rehabilitation
Grazing	• Alternate watering sources (trick tanks, upland dirt tanks, and upland wells) • Planned/rotational grazing • Cattle guards to control access • Fencing (pasture cross fencing and creation of additional pastures for improved stock rotation methods and riparian exclosure fencing)
Loss of Riparian Habitat	• Habitat restoration and rehabilitation - Removal of non-native plant species - Planting native vegetation • Grazing exclosure(s) 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) • Stabilizing, relocating, and channeling runoff around mine and mill tailings
Septic Systems	• Identify and replace malfunctioning systems • Outreach to encourage preventative maintenance • Connect to centralized wastewater treatment system
Streambank Modification/ Hydromodification	• Streambank Stabilization via: - Revetment (e.g. vanes, j-hooks) - Grade control (e.g. cross vanes) - Grazing exclosures or rotation - Terracing / revegetation of slopes - Installing vortex weirs - Replacing undersized culverts - Brush control
Urban Stormwater	• Education/Outreach activities • Develop stormwater management plan • Propose new ordinance and/or development codes • Propose new construction standards • Install swales, French drains, detention ponds • Collect and treat runoff

IV. Water Quality Protection and Restoration

A. NPS CWA §319 Watershed Restoration Grants

Once the water quality problem has been identified and planning strategies have been developed, a variety of programs are available to protect and restore the water quality. One of the primary goals of New Mexico's NPS Management Program is to educate and implement BMPs to reduce NPS pollutants entering surface and ground waters. To accomplish this goal, the Program administers CWA §319 watershed restoration grants. The focus of implementation projects in recent years has been on impaired waters with approved TMDLs, and on a limited group of impaired waters for which a TMDL is not required because the impairment is thought to be caused by insufficient flow (i.e., Category 4C streams). Through a combination of funding programs, partnerships, education and outreach activities, New Mexico encourages interested parties to implement BMPs to control or reduce the degree of water quality impairments due to non-point sources.

Bluewater Creek before (2009) restoration…

Since 1998, the NPS Management Program has implemented over 100 watershed restoration projects. New Mexico's current and recently completed CWA §319 watershed restoration implementation projects are displayed on Figure 8 and in Appendix D. In addition, CWA §319(h)(11) requires New Mexico to report, on an annual basis, to EPA Region 6 progress in meeting milestones in the NPS Management Program plans, reductions in NPS pollutant loading, and improvements in streams that do not meet water quality standards. The SWQB maintains a website of all NPS Annual Reports from calendar year 2000 to present.

…and after (2016) restoration.

Information on projects completed in specific years can be found in the SWQB's *NPS Management Program Annual Reports* at:
https://www.env.nm.gov/surface-water-quality/nps-annual-reports/

B. New Mexico's River Stewardship Program

A key part of the NPS Management Program is the state-funded River Stewardship Program (RSP). The goal of the RSP is to fund projects that enhance the health of rivers by addressing the root causes of poor water quality and stream habitat. The RSP builds on collaboration and restoration techniques developed and implemented during successful CWA §319 and state funded implementation projects around the state.

Specific RSP objectives 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.

Gila River - Before

Gila River - After

RSP projects, like CWA §319 projects described above, are selected through a competitive, statewide application or Request for Proposals process. RSP projects are distributed statewide. Priority areas have been selected, although projects that are not within the priority areas are also considered. Eligible applicants include: towns, cities, counties, soil and water conservation districts, irrigation districts, for-profit organizations; and Indian Nations, Pueblos and Tribes. Evaluation criteria favor projects that improve water quality, enhance fish and wildlife habitat, support local economies, and reduce downstream flood hazard.

Example of grazing management river restoration project eligible for RSP funding

Although RSP projects are not required to implement watershed-based plans, each RSP project proposal is evaluated relative to its alignment with local, state, tribal or federal planning documents, and watershed-based plans often provide the strong basis in planning for proposals to be competitive. New Mexico's current and recently completed RSP projects are displayed on Figure 8 and in Appendix D.

To view additional information on the River Stewardship Program, visit:
https://www.env.nm.gov/swqb/RiverStewards/.

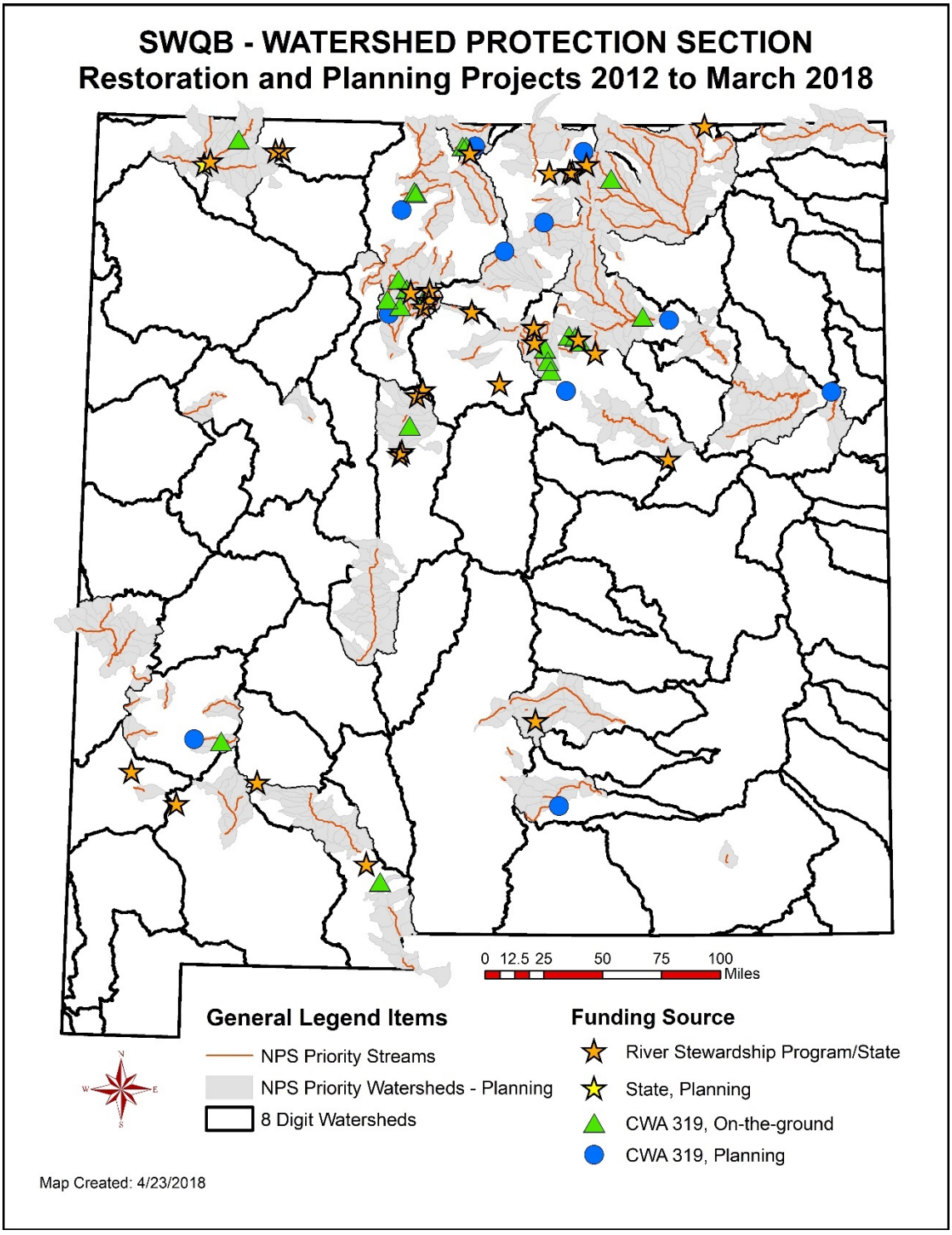


Figure 8. CWA §319 and RSP restoration and planning projects, 2012-2018

C. Point Source Regulation and Other State Certifications

Point source pollution results from discharge of contaminants through discrete conveyances such as pipes. In New Mexico, the EPA under CWA §402 administers the discharge of pollutants through the National Pollutant Discharge Elimination System (NPDES) program. State certification of federal permits is required under CWA §401 and ensures the permits are compatible with state laws, protect the state's water quality standards, and implement the state's WQMP/CPP. In New Mexico, the NMED is the CWA §401-certifying authority for waters of the state. The SWQB Point Source Regulation Section (PSRS) fulfills this responsibility, certifying eighteen NPDES permits in state FY 2016 and twenty permits in state FY 2017. The primary goal of 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.

Rock Lake State Fish Hatchery

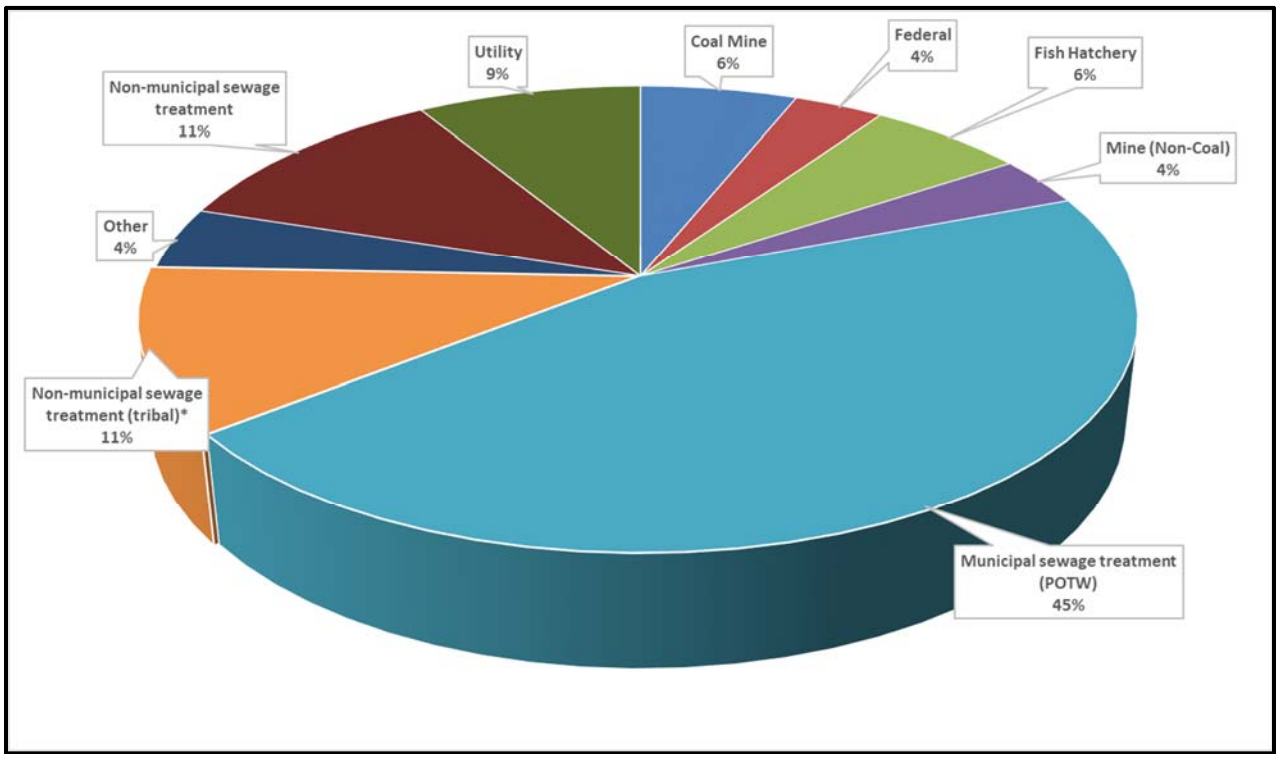
The PSRS is credentialed by EPA to conduct compliance inspections on behalf of EPA and to serve as a local point of contact for providing information to operators and other agencies regarding the federal regulatory program and also offering compliance assistance to individual facilities. Inspections 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 2017b) using current, EPA-approved forms and checklists. The data and information collected are used to evaluate compliance and to support state or federal enforcement and permitting activities. The PSRS conducted 76 NPDES compliance inspections in FY 2016 and 53 inspections in FY 2017. In addition, EPA executed 17 NPDES enforcement actions in FY 2016 and 16 actions in FY 2017, most of which were based on state inspection reports.

State enforcement of NPDES permitted discharges 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, which applies to any discharger who is given written notice of a NPDES permit violation from EPA and who has not corrected the violation. 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. Furthermore, the NMED has the authority under 20.6.2.1220 NMAC to issue compliance orders, including penalties, to a discharge that exceeds any water quality standard in state regulations, or is not complying with a condition or provision of an approved or modified discharge plan or permit. The state may also enforce provisions of 20.6.2.2201 NMAC prohibiting disposal of refuse in a watercourse.

In addition to conducting individual permit inspections, the PSRS also conducts both construction site and industrial facility stormwater inspections in accordance with the provisions of the Construction General Permit or the Multi Sector General Permit. The PSRS conducts outreach to construction site and industrial facility owners and operators to inform them of requirements under the CWA. The PSRS also assists with

implementation of the Phase I and II Municipal Separate Storm Sewer Systems or "MS4" (i.e., urban stormwater) permitting program in New Mexico. PSRS has assisted EPA with implementation of the watershed-based MS4 permit in the Middle Rio Grande (issued December 2014) and has assisted EPA with the issuance of similar requirements in the statewide sMS4 permit, to be issued soon. PSRS will continue to provide assistance conducting audits of these programs as needed.

Figure 9 illustrates the distribution of individual NPDES permitted facilities by type and percentages. Because of the large percentage of wastewater treatment plants in the state, these facilities continue to cause adverse effects on water quality in local areas, in part due to poor operation and maintenance or limited funding to implement technological improvements or upgrades to treatment facilities.



NOTES: *SWQB does not certify these permits on tribal lands (comment provided only)

Figure 9. Distribution of Individual NPDES permits in New Mexico (115 permits total)

The U.S. Army Corps of Engineers (USACE) under CWA §404 administers the discharge of dredged or fill material in New Mexico. 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 nonpoint source pollution associated with such activities. State certification of these federal permits is required under CWA §401, and the NMED is certifying authority for waters of the state. The NPS Management Program leads this responsibility for New Mexico with assistance from other programs as needed. In 2017, the NPS Management Program completed water quality confirmations, certifications, or other actions on sixty-six dredge or fill permits.

For more information on State Certifications, see:
https://www.env.nm.gov/surface-water-quality/npdes-permits/
https://www.env.nm.gov/surface-water-quality/dredgeandfillactivities/
https://www.env.nm.gov/surface-water-quality/public-notices/

D. Other NMED Water Pollution Control Programs

CWA §303(d) and §305(b) are primarily implemented by the SWQB. However, because surface water quality is utilized and affected in diverse ways by different activities and needs, NMED has other bureaus and programs that also address water pollution control in New Mexico under the WQA. A few are highlighted below.

1. Drinking Water Bureau

NMED's Drinking Water Bureau (DWB) is responsible for regulating public water systems who are 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.

All public drinking 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's entry point into distribution, after treatment, and analyzed for contaminants according to an established schedule. The DWB provides oversight to all of New Mexico's public drinking water systems and reviews these data, periodically inspects the systems according to a rotating schedule depending on the type of system,

NEW MEXICO OBTAINED PRIMACY FOR THE REVISED TOTAL COLIFORM RULE

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 implementation of the RTCR in NM began on April 1, 2016. Additional Information is available at: https://www.env.nm.gov/drinking_water/rtcr/.

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.

Systems utilizing surface water sources for drinking water 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 to comply with all maximum contaminant levels. As of February 2018, out of 1,089 public drinking water systems, 63 public drinking water systems use or purchase water obtained from either surface water or ground water under the direct influence of surface water. When chlorine is used as part of drinking water treatment, disinfection byproducts can form when organic carbon reacts with the chlorine. Typically, systems can adjust treatment and operations as an effort to 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.

In addition to providing oversight to systems, DWB's Source Water and Wellhead Protection Program 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. The DWB assists systems to conduct assessments of potential sources of contamination for all 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 and one-half mile on either side of each intake. Additional potential contamination sources posing high risk are identified for the entire watershed as delineated from 500 feet below a drinking water intake. 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. In early 2017, Source Water Protection Plans were completed for the cities of Farmington and Bloomfield.

Buckman Direct Diversion on the Rio Grande

These plans are a start to more broad source water protection planning for the San Juan and Animas rivers. The City of Aztec will potentially be included in 2018 or 2019. In the past year, DWB also began working with the Buckman Direct Diversion and the City of Santa Fe on their source water planning efforts. As these two systems finalize their initial plans, the DWB also began working with the City of Albuquerque to update their 2009 water protection plan, thereby initiating comprehensive source water protection planning for the highly populated Upper and Middle Rio Grande Watersheds.

For additional information on NMED's Drinking Water Bureau, visit:
https://www.env.nm.gov/dwb/index.htm.

2. Utility Operator Certification Program

The Utility Operator Certification (UOC) Program administers the certification program for water and wastewater operators at all public water and wastewater utilities in New Mexico. This includes development, scheduling and administration of certification examinations, processing applications for certification and renewal, tracking all certified operators continuing education courses, evaluating training courses for relevance to program, tracking compliance with operator certification requirements, as well as working with the New Mexico WQCC and the Utility Operator Certification Advisory Board. NMED administers the UOC Program pursuant to the New Mexico Utility Operators Certification Act, NMSA 1978, §§ 61-33-1 to 10.

The UOC 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 46,245 and 37,763 hours were recorded in state FY 2016 and state FY 2017;
- Increasing the number of certifications through examinations that ensure the necessary knowledge and ability of all operators –,1293 and,1303 exams were conducted resulting in 575 and 545 certifications in state FY 2016 and state FY 2017, respectively; and
- Tracking the number of certified operators who renew each certificate held (renewal required every three years) – 1,056 and 1,060 operators renewed their certification in state FY 2016 and state FY 2017, respectively.

UOC Short School and Exam Session

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

For more information on the Utility Operators Certification program, see:
https://www.env.nm.gov/drinking_water/utility-operator-certification-program/.

For additional information on the UOC Advisory Board, see:
https://www.env.nm.gov/drinking_water/dwbutility-operators-certification-advisory-board/.

instruction at training events for certification of new operators and renewal of certification for existing operators.

3. Ground Water Quality Bureau

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 groundwater, 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 relies on several programs to protect and maintain groundwater quality. The primary statute dealing with groundwater quality management is the WQA, which authorizes the WQCC to adopt groundwater quality protection regulations and standards (20.6.2 NMAC). Key features of the WQA and the WQCC regulations relating to groundwater include:

- A requirement for dischargers to obtain a groundwater discharge permit to prevent groundwater contamination from discharges that have the potential to impact groundwater quality, including discharges to underground injection control wells;
- Requirements for reporting and addressing spills and releases;
- Development of groundwater quality standards;
- Requirements to abate groundwater pollution; and
- Provisions for civil and criminal penalties for violation of the regulations and standards.

The role of the NMED Ground Water Quality Bureau (GWQB) is to protect the environmental quality of New Mexico's groundwater resources; and to identify, investigate and clean-up contaminated sites which pose significant risks to human health and the environment. Specifically, the GWQB:

- Issues groundwater pollution prevention permits;
- Implements the departments responsibilities under the New Mexico Mining Act to ensure that environmental issues are addressed and standards are met;
- Oversees groundwater investigation and remediation activities;
- Identifies, investigates and remediates inactive hazardous waste sites through implementation of the federal Superfund program;
- Oversees agreements between the state and responsible parties; and
- Implements the Voluntary Remediation Program.

The GWQB strives to increase industry and public understanding and awareness of the importance of safe groundwater supplies in sustaining the quality of life in New Mexico for this and future generations, and the importance of protecting groundwater quality through pollution prevention initiatives. The GWQB also offers free water quality screening for domestic wells at water fairs routinely held around New Mexico.

Groundwater quality monitoring is typically required at permitted facilities to determine baseline groundwater quality, serve as a leak detection method, and as part of remediation efforts to determine whether or not remediation efforts are effective. While household septic tanks or cesspools are the predominant source of nonpoint source contamination of groundwater in New Mexico, such degradation may also be caused by other diffuse sources such as residual minerals from evapotranspiration, land disturbance 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.

Groundwater Sampling

The WQCC held a public hearing on NMED's Petition to Amend the Ground and Surface Water Protection Regulations (20.6.2 NMAC) from November 14 – 17, 2017. Programs established 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 groundwater quality and which implement the groundwater regulations and water quality standards directly or by reference. In addition, the State cooperates with local and federal governments on various programs relevant to groundwater pollution control.

For more information on NMED's Ground Water Quality Bureau (including updates to the petition to amend ground water regulations), visit: https://www.env.nm.gov/gwb/.

V. Measure Progress/ Update Surface Water Quality Goals

The fourth phase of New Mexico's implementation of the CWA framework for surface waters is to continually grow and improve water quality identification and control techniques through measuring progress and updating surface water quality goals. Identification goals are reviewed and updated through activities such as the triennial review of water quality standards; the biennial revisions and improvements to the IR listing methodologies, especially related to developing numeric thresholds for narrative water quality criteria; and development of tools to identify, measure condition, and restore additional waterbody types such as wetlands. Progress towards meeting these goals is continually evaluated through rotational surface water quality monitoring, wetlands mapping, site inspections, consideration of special needs and concerns that hamper the ability to identify and address water quality impairments, and effectiveness monitoring of restoration implementation activities. Two specific SWQB programs that focus on these areas are highlighted below, along with special water quality issues and concerns in New Mexico.

A. Effectiveness Monitoring Program

An important goal of the NPS Management Program is to monitor the effects of NPS pollution control projects on water quality. These projects are primarily stream restoration measures funded under CWA §319, but also include projects funded through the RSP and the 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 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 monitoring provides data for 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. Initial results from the data analysis indicate that peak summer temperatures in many streams have improved, but still exceed the associated aquatic life water quality criteria in some streams.

A common restoration technique for temperature impairments is to exclude cattle and elk grazing by building fence exclosures (i.e., intended to exclude animals from these areas to remove grazing impacts) and planting native vegetation to bring back the riparian cover. 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. These projects are expected to have beneficial effects which will continue to increase as riparian vegetation continues to grow and provide shade to the adjacent stream.

Watershed-scale change to bring about water quality standards attainment is usually a long-term effort. Economic changes, societal values, climate cycles, and climate change each may exert as much influence on water quality as isolated projects or small shifts in land management practices. NMED's Effectiveness Monitoring Program seeks to recognize water quality standards attainment attributable to projects or intentional land management improvements. A key NPS Management Program milestone is for NMED to submit one or more nominations per year to EPA for recognition as a NPS Success Story. New Mexico's recognized NPS Success Stories are listed in Table 8.

Table 8. New Mexico NPS success stories

Waterbody	Year
Bluewater Creek (Perennial portions Bluewater Reservoir to headwaters)	2017
Polvadera Creek (Cañones Creek to headwaters)	2015
Willow Creek (Pecos River to headwaters)	2014
Sitting Bull Creek (Last Chance Canyon to Sitting Bull Springs)	2014
Comanche Creek (Costilla Creek to headwaters)	2013
Santa Fe River (Paseo del Cañon to Santa Fe WWTP)	2011
Rio Cebolla (Rio de las Vacas to Fenton Lake)	2010

For more information on New Mexico restoration success stories, visit:
https://www.env.nm.gov/swqb/wps/Effectiveness/ and https://www.epa.gov/nps/nonpoint-source-success-stories#nm

B. New Mexico's Wetlands Program

Approximately one million acres of wetlands exist in New Mexico, which represents only a portion of the wetlands thought to be in existence in the early 1800s. 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. The SWQB's Wetlands Program administers CWA §104(b)(3) wetland restoration and program development grants. 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 their original extent especially targeting threatened, impacted and scarce wetlands types.

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 extreme weather events common to New Mexico, such as drought and flashfloods by allowing water to slow down and infiltrate, thus augmenting groundwater storage and aquifer recharge, and attenuating the power and intensity of flashfloods. 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. 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, groundwater pumping that lowers already 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. 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 groundwater 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 in Curry County

In the southeastern part of New Mexico, there are many economically and ecologically valuable playas that serve as critical oasis-like 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 fifteen priority species of shorebirds listed in the US 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 groundwater recharge zones, and therefore serve to sustain local water sources.

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 primary 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 methods;
- 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.

In 2017, EPA accepted the updated Wetlands Program Plan for New Mexico (WPP, NMED/SWQB 2017b**) as meeting the four required elements for such plans: monitoring and assessment; regulation; voluntary restoration and protection; and water quality standards for wetlands. Key activities to implement the WPP include:

- 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 (NMED/SWQB 2013);
- Collecting and analyzing wetlands data using the New Mexico Rapid Assessment Method (NMRAM);
- Continuing to map and classify all wetlands in New Mexico including playas, isolated wetlands, and seeps and springs;
- Continuing to explore the relationship of groundwater and surface flows that sustain wetlands; and
- Improving WQS that apply to wetlands.

NMRAM data on the Rio Grande Floodplain, Valencia County

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 2011) classification for updating and inclusion in the National Wetlands Inventory. 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. 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. Assessment data from the NMRAM are providing the basis and justification for development of wetlands WQS and designated uses that will enable the state to more comprehensively protect wetlands. These data provide justification for preventing or eliminating stressors that will ultimately lead to increases in wetland quality. 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 stakeholders and EPA. These assessment and monitoring initiatives include collaboration with agencies and stakeholders through advisory committees and the New Mexico Wetlands Roundtables to ensure that the state's overall wetland program develops comprehensively and in a coordinated manner.

Restored Wetlands in the Cebolla Canyon Closed Basin

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 EPA Region 6 CWA §104(b)(3) Wetlands Program Development grants and 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.

Figure 10 depicts 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 ensure that the biological, chemical, and physical integrity of New Mexico wetlands are adequately protected.

For more information on New Mexico Wetlands Program, visit:
https://www.env.nm.gov/surface-water-quality/wetlands/

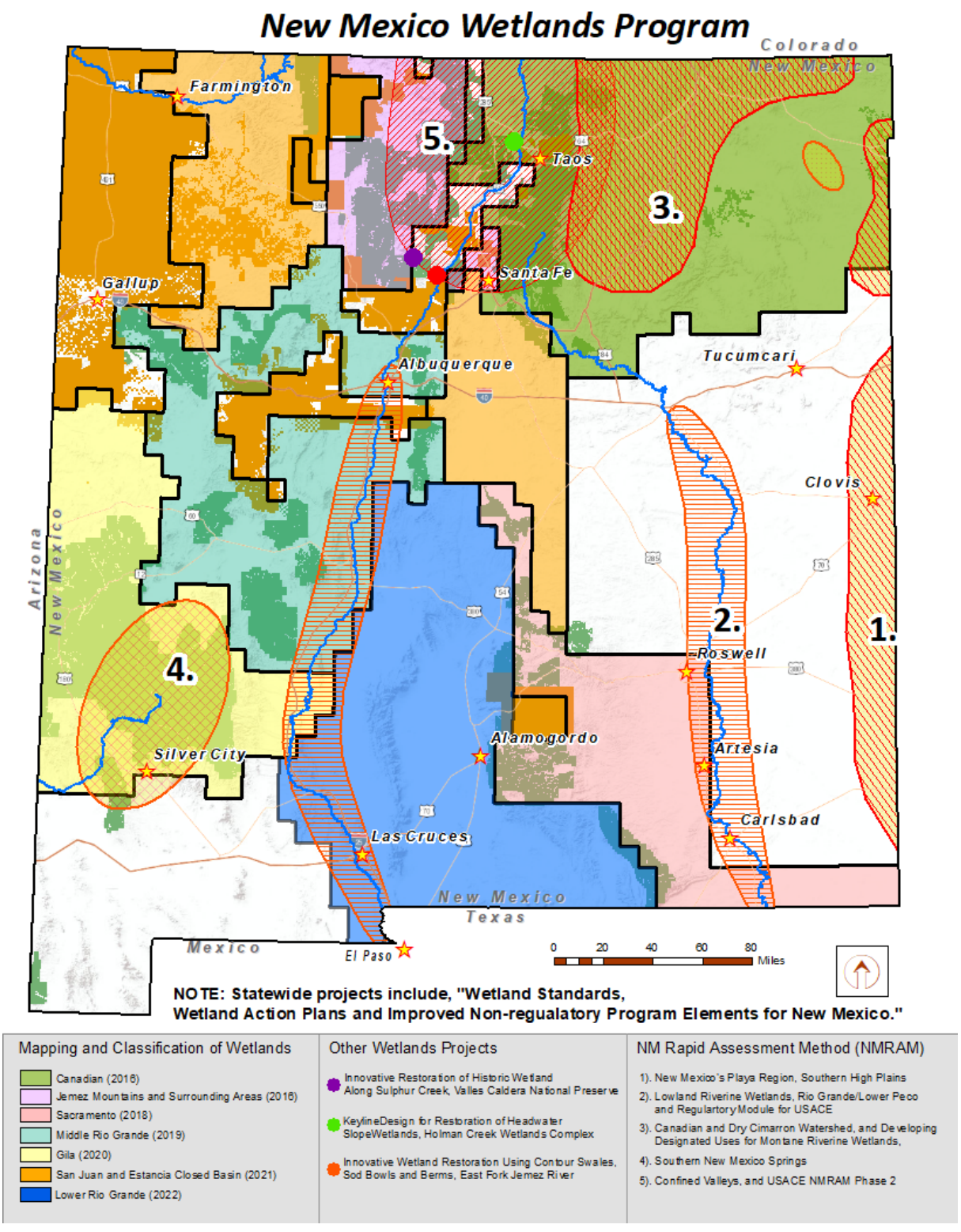


Figure 10. Approximate Location of Current Wetland Projects in New Mexico

C. Special State Surface Water Concerns and Recommendations

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. Below is a list of the more significant surface water issues in New Mexico.

1. Gold King Mine Spill

On August 5, 2015, an estimated 3 million gallons of contaminated mine wastewater containing sediment, heavy metals and other chemicals were released from the Gold King Mine (GKM) in the headwaters of Animas River near Silverton, CO. The GKM release included aluminum, iron, manganese, lead, copper, arsenic, zinc, cadmium, and small amounts of mercury (EPA 2017c). The plume was carried by the Animas River into New Mexico, entered the San Juan River, which flowed to the Navajo Nation and Utah.

The GKM was operated from approximately 1887 until 1922 and is only one of the 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.

The EPA Office of Research and Development (ORD) consolidated all available data in part to document the fate and transport of heavy metals released from the GKM spill (EPA 2017c). These data were downloaded from EPA's GKM website. Additional 2017 sampling data provided by ORD was added to the consolidated dataset. Post-spill surface water quality data collected at mainstem Animas River and San Juan River sampling stations in New Mexico from 2015-2017 were assessed against applicable WQS found in 20.6.4 NMAC. Although the 2015 dataset contained a few exceedences of dissolved copper (San Juan River only) and dissolved arsenic (San Juan River and Lower Animas River) water quality criteria, the 2016 and 2017 datasets did not have any exceedences of applicable metals criteria. As stated in New Mexico's listing methodology, more recent data may take precedence over older data, especially in cases where there was a temporary disturbance and several consecutive years of data before and after the event (NMED/SWQB 2017a). Available surface water data reviewed for this report indicate that surface water metal concentrations in the Animas River and San Juan River have returned to pre-spill conditions. The magnitude and frequency of the limited 2015 exceedences, combined with no additional exceedences of any applicable criteria in 2016 and 2017, did not warrant an impairments listing. The SWQB is currently implementing a two-year water quality survey in the San Juan River watershed during 2017-2018; these data will be assessed for development of the 2020-2022 IR. NMED's Chief Scientist is continuing the evaluation of potential impacts to sediments in the Animas and San Juan Rivers.

For more information on the NMED and EPA GKM response efforts, long-term monitoring plan, current advisories, timelines, and news releases, visit: https://www.epa.gov/goldkingmine and https://www.env.nm.gov/river-water-safety/

2. *Drought and Climate Change*

Living in the desert southwest, droughts are a way of life, but droughts are predicted to increase in both frequency and severity in many regions of the world, including the southwestern U.S., due to climate change (OSE/ISC 2006). The most common hydrological effects of drought are reduced runoff (snowmelt and monsoon), decreased stream flows, and lower lake levels. However, droughts may also result in major changes in water quality.

In general, droughts and the immediate recovery period have substantial water quality effects that vary depending on the waterbody and its watershed (Mosley 2015). For example, decreases in stream flow will likely lead to increases in salinity and other conservative solutes due to evapo-concentration. Higher air temperatures due to climate change coupled with decreased streamflow and lower lake levels associated with drought can increase water temperatures, enhance algal production, support toxic algal blooms, and lower dissolved oxygen levels, all of which are stressors to aquatic life. Where point sources of pollution are present, water quality may worsen due to less dilution, particularly for nutrients. Storage and buildup of material in watersheds during drought (due to reduced flushing and increased productivity) can also result in large post-drought flood loadings of pollutants. Large inputs of nutrients, sediment and carbon can cause severe downstream water quality effects such as deoxygenation and fish kills. The maintenance of long-term monitoring programs will identify trends in water quality and evaluate project effectiveness. In addition, watershed restoration projects will enhance the natural environment and improve watershed resilience to climate change, including droughts, floods and wildfire.

3. *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 WQS 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 the time at which 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.

4. *Stormwater*

Controlling stormwater runoff and its impact is a serious issue facing communities across New Mexico. Urban and highway stormwater runoff is rainfall or snowmelt that runs off the ground or impervious surfaces such as buildings, roads, and parking lots, and drains into natural or man-made drainage systems. In most cases, it drains directly into streams, river, lakes, or wetlands without receiving any treatment to remove pollutants. Because of this, stormwater is a leading cause of water pollution.

Changes in land use have a major effect on both the quantity and quality of stormwater runoff. Urbanization, if not properly planned and managed, can dramatically alter the natural hydrology of an area because it increases impervious cover, decreases the amount of rainwater that can naturally infiltrate into the soil, and consequently increases the volume and rate of stormwater runoff. These changes lead to more frequent and severe flooding, and therefore potential damage to public and private property. In addition, the increased flow associated with urbanization can significantly alter aquatic life habitat through erosion of the streambed and banks and deposition of eroded materials in critical habitat areas.

Stormwater runoff often contains elevated concentrations of a variety of constituents that may contribute to WQS exceedences in state surface water. Of particular concern are certain heavy metals, such as copper, lead, and zinc; certain organics, such as polyaromatic hydrocarbons (PAHs) and pesticides; oil and grease; nutrients (nitrogen and phosphorus); sediment; and bacteria, such as *E. coli*. On the Pajarito Plateau, there are additional concerns associated with legacy contaminants from the Manhattan Project and Los Alamos National Laboratory. Untreated stormwater entering our waterways carry certain toxicants that may negatively impact aquatic life or drinking water supplies depending on the nature of the receiving water; prohibit or limit swimming, fishing or boating; present dangers to public health and safety; and increase the frequency and magnitude of flooding. Therefore, effective water quality protection requires the "treatment" of stormwater through the use of various preventive and control measures to reduce the impact of impervious surfaces and minimize increases in stormwater runoff, such as low impact development, structural controls, and pollution prevention strategies.

5. 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 2014b), New Mexico is currently not pursuing adoption of numeric nutrient criteria. Instead, New Mexico is pursuing continued refinement of numeric thresholds for our narrative criteria and associated listing methodologies. Specific accomplishments this listing cycle include:

- Incorporation of the collaborative EPA's Nutrient Scientific Technical Exchange Partnership and Support (N-STEPS) project (Jessup et. al 2015) findings to refine numeric nutrient threshold values in New Mexico's listing methodology for wadeable, perennial streams;
- Continued protection of water-quality limited segments in accordance with both state (20.6.4.8 NMAC) and federal (40 C.F.R. §131.12) antidegradation policies and implementation procedures to ensure that Tier 1 waters (i.e., waters identified as "impaired") are not further degraded and that NPDES nutrient effluent limitations, 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 and load reductions that are achievable while neither over- nor under-protective; and
- Adoption of a Temporary Standard provision during the Triennial Review process to encourage incremental improvements in water quality and establish a clear path to compliance (SWQB is currently working with EPA and a contractor to develop nutrient temporary standards proposals for five demonstration facilities in New Mexico that consider the existing facility design as well as local economic and social factors).

6. Adequate Funding of Water Quality Programs

Protecting the nation's water from pollution and contaminants relies on cooperation between EPA, states, and tribes; however, over the past decade state and federal funding for water quality programs has decreased (or remained flat) to a point where some basic services can no longer be sustained (see graph below). Core Water Protection program components include: water quality criteria, standards, and technology-based effluent guidelines; NPDES permitting and compliance; water quality monitoring and assessment; TMDLs; watershed management; water infrastructure and grants management; core wetlands programs, and CWA §106 program management, including groundwater protection. Even funding cuts in other agencies that are often thought of as 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. Cuts and sweeps of state funding have resulted in placing more burden on federal grants to fill those gaps, but federal assistance grants are also on the chopping block.

In March 2018, the U.S. Congress passed the FY 2018 omnibus bill to fund the federal government through September 2018 (end of the federal fiscal year). The bill holds EPA operating programs at the FY 2017 enacted level, maintaining the lowest level of funding since FY 2009. While EPA operating programs are held level, the bill provides additional funding for states to do high priority permitting and cleanup work and significant increases for on-the-ground cleanup and infrastructure. These increases include:

- $2.9 billion for the Clean Water and Drinking Water State Revolving Loan funds, an increase of $600 million, which help states and localities improve water infrastructure;
- $50 million in new funding for programs authorized in the WIIN Act to provide access to basic wastewater and drinking water services and to clean up lead in schools;
- $1.15 billion, a $66 million increase, for Superfund to help clean up the nation's most polluted sites.
- $63 million for the Water Infrastructure Finance and Innovation Act (WIFIA) loan program, which will leverage federal dollars to provide over $6 billion in financing for water infrastructure projects.

Looking forward to next year, the following table[2] provides a break-down of the proposed FY 19 National Water Program grants (dollars in thousands), which shows a **60.5% reduction in state assistance grants for key water quality programs in New Mexico**. Many of these grants also require state match.

National Program / State Grant **WATER**	FY 2017 Actuals	FY 2018 Appropriation	FY 2019 PB	Delta FY 2019 PB – FY 2018 ACR	% Change FY 2019 PB – FY 2018
Pollution Control (CWA §106)	$227,686	$230,810	$153,683	($75,556)	-33.0%
Nonpoint Source (CWA §319)	$169,772	$170,920	$0	($169,754)	-100.0%
Wetlands Program Development	$15,867	$14,660	$9,762	($4,799)	-33.0%
	$413,325	**$413,554**	**$163,445**	**($250,109)**	**-60.5%**

NOTES: PB = President's Budget, ACR = Annualized Continuing Resolution

Cutting state assistance grants will seriously inhibit New Mexico's ability to implement the Clean Water Act. Moreover, if water quality overall is poorer because Clean Water Act programs are limited then treatment

[2] From https://www.epa.gov/sites/production/files/2018-02/documents/fy-2019-epa-bib.pdf.

of the water to achieve beneficial uses (such as safe drinking water, livestock watering, irrigation, wildlife habitat, and recreation) will cost more.

Here are the Clean Water Act programs in NM that may be underfunded or cut in FY 19:

1. Pollution Control (CWA §106) – This grant program provides federal assistance to states, tribes, and interstate agencies to establish and maintain programs for the prevention and control of surface and groundwater pollution from point and nonpoint sources.

2. Nonpoint Source (CWA §319) – This program provides grants to assist states and tribes in implementing approved elements of Nonpoint Source Programs including: regulatory and non-regulatory programs, technical assistance, financial assistance, education, training, technology transfers, and demonstration projects.

3. Wetlands Program Development (CWA §104(b)(3)) – This program provides technical and financial assistance to states, tribes, and local governments to support development or refinement of wetland programs through monitoring and assessment, voluntary restoration and protection, and wetland water quality standards in order to increase the overall acreage and condition of wetlands.

As the Southwest continues to experience drought conditions and changing climatic conditions, higher frequency and magnitude of wildfires, and other challenges related to urbanization, 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.

Funding challenges exist on the state level as well. 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 FY 2012, 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, and hampers the SWQB's ability to detect and report long-term trends at key monitoring stations around the state.

VI. Financial Resource Analysis

A. Resources Applied to Surface Water Quality Management

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 invests in water quality management programs and water quality improvements, which reflects 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 the complexity of environmental needs continues to increase, there is an expectation that the SWQB will continue to meet and exceed 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 the SWQB, they are largely supported by the federal government. However, and as referenced throughout this report, there are also local, state, and even private resources that directly or indirectly affect the state's water quality. Table 9 summarizes the estimated amount of funds the SWQB expended annually to implement a comprehensive water quality management program, and is based on actual expenditures for state FY 2017. 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 9. Estimated State Expenditures for New Mexico's Surface Water Quality Management Implemented Through NMED SWQB

Water Quality Management Program	Federal	State	Total
Monitoring & Assessment (Includes Water Quality Management Program, TMDL Development, and State Fish Advisories)	$ 922,558	$ 530,221*	$ 1,452,779
Point Source Regulation	$467,332	$253,991	$721,323
Nonpoint Source Management	$ 1,083,306	$ 308,669	$ 1,391,975
Wetlands Program	$ 489,065	$ 67,137	$ 556,202
Water Quality Standards (includes planning and reporting activities)	$ 124,134	$ 88,297	$ 212,431
River Stewardship Program**	--	$ 752,940	$ 752,940
Total	**$ 3,086,395**	**$ 2,001,255**	**$ 5,087,650**

NOTES: The above numbers are based on NMED state FY 2017 actual expenditures.
* = funding includes State Level of Effort for CWA §106 Grant ($220,084) and water quality sample analysis awarded as "work time units" ($178,735)
** = 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 10. 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 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).

Table 10. 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
Medium WWTP 1-4 MGD	$780,000 per year
Large WWTP > 5 MGD	$1,500,000 per year

Source: Utility Operator Certification Program

Table 11. Summary of Improvement and Construction Costs for New Mexico Water, Wastewater, and Solid Waste Facilities

Program	Description	Funds Disbursed in FY 2016	Funds Disbursed in FY 2017
State Appropriations Program	State Legislature capital outlay appropriated for the construction of community water supply, wastewater facility, and solid waste facility projects.	$ 17,726,506	$ 26,703,656
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 groundwater 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	$ 12,848,694	$ 21,432,010
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.	$ 1,974,941	$ 1,596,417
	Water-Related Projects TOTAL	**$ 32,550,141**	**$ 49,732,083**

The NMED Construction Programs Bureau (CPB) administers the Clean Water State Revolving Fund (CWSRF), the Rural Infrastructure Revolving Loan Program (RIP), and the Special Appropriations Capital Outlay Program (SAP). The CWSRF provides funding for a variety of wastewater projects including nonpoint source and solid waste projects; the RIP provides funding for water, wastewater and solid waste projects; and the SAP oversees legislatively assigned water, wastewater and environmentally related projects. Technical assistance and oversight is provided for all projects to ensure environmentally sound, high quality projects free of waste, fraud and abuse. Table 11 summarized the programs administered by the CBP, and shows the amounts disbursed in FY 2016 and FY 2017.

Benefits of these expenditures can be seen directly and indirectly throughout communities in New Mexico 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.

The NMED DWB and New Mexico Finance Authority (NMFA) administer the Drinking Water State Revolving Loan Fund (DWSRLF), which provides low-cost loans to eligible public drinking water systems. In state FY 2016 the NMFA closed ten loans (nine new loans and one amendment) totaling $16,436,843 and in state FY 2017 closed sixteen loans (twelve new loans and four amendments totaling $12,163,705. 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.

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.

For more information on the Construction Programs Bureau and WIT, visit:
https://www.env.nm.gov/construction-programs/ and https://www.env.nm.gov/WIT

VII. Public Participation and Agency Coordination

A. CWA §303(d)/ §305(b) Integrated Report Public Participation

All individuals living and working in the New Mexico 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.

There are several opportunities for public and other stakeholder participation in the development of the IR, from data collection through impairment determination and reporting. The public participation requirements of specific water quality programs are specified in 40 C.F.R. §25.4 and described in the WQMP/CPP (WQCC 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).

What is a Stakeholder?
For the purposes of this report, a 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.

During rotational watershed survey planning, meetings are held in the planned survey area to inform stakeholder of proposed sampling locations, frequencies, and parameter suites. These meetings provide an important opportunity to gather local knowledge of water quality issues and concerns, and often result in revisions to the draft field sampling plans.

Prior to development of the draft Integrated List for each listing cycle, the public has an opportunity to provide comments to the listing methodology (i.e., CALM) 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 SWQB typically announces the "call for outside data" at the same time. The CALM used to develop the draft 2018-2020 Integrated List (Appendix A) was released for public comment in this manner (NMED/SWQB 2017a). A draft of this listing methodology was opened for a 30-day public comment period from April 12 to May 11, 2017. Comments received were reviewed, considered, and incorporated as deemed appropriate.

The public participation associated with the development of this Integrated Report and associated Integrated List (Appendix A) included notifying stakeholders of a 45-day public comment period April 18 - May 31, 2018. Public notices were posted to NMED's website, sent through the GovDelivery e-mail delivery service, and announced by NMED's public relations officer. In addition, a Public Involvement Plan was prepared as required per NMED policy. The SWQB responded in writing to each comment received in Appendix C of the IR. These responses were forwarded to all commenters prior to the WQCC meeting.

B. Coordination with state and federal 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 particular, the NPS Management Program 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 due to non-point sources. In addition to NMED, numerous other New Mexico and federal agencies conduct activities that utilize, protect, and restore surface water quality, including but not limited to:

- Office of the State Engineer (OSE),
- Interstate Stream Commission (ISC),
- Department of Game and Fish (NMDGF),
- Department of Agriculture (NMDA),
- Energy, Minerals, and Natural Resources Department (EMNRD),
- Department of Health (NMDOH),
- Oil Conservation Commission (OCD),
- 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).

Northern Wetlands Roundtable, Santa Fe, 2018

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. For example, the Wetlands Program coordinates and facilitates the New Mexico Wetlands Roundtable consisting of state, federal, and tribal agency participants, and NGO partners such as the New Mexico Riparian Council, Society of Wetland Scientists Rocky Mountain Chapter, 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.

Regular coordination between the USFS and the SWQB continues to be an integral part of the NPS Management Program and has facilitated cooperation on many successful NPS pollution reduction projects. As mentioned in the state certification section above, the NPS Management Program also coordinates with the USACE to implement the State's CWA §401 certification responsibilities for CWA §404 permits.

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.

C. 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, NMDGF, and the SWQB 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 §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, except in cases where there is a consumption advisory due to mercury but available fish tissue data indicate New Mexico's methylmercury criterion of 0.3 mg/kg in fish tissue is not exceeded (NMED/SWQB 2017a).

Electrofishing in a New Mexico

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 areas 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*., 2016). The New Mexico Game Commission rescinded the catch-and-release only

rule for Brantley, effective April 1, 2018. There will still be a fish consumption advisory for DDT. This change will be reflected in the next update to the fish consumption advisories.

New Mexico fish consumption advisories are available online at:
https://www.env.nm.gov/swqb/advisories/

D. Additional SWQB Outreach Efforts

The SWQB supports or implements several outreach activities throughout the year, including but not limited to:

- Publishing the quarterly newsletter *Clearing the Waters (*https://www.env.nm.gov/surface-water-quality/newsletters/*)*,
- Preparing BMP brochures and other water quality topics for conferences and stakeholders,
- Developing and maintaining the extensive SWQB web site (https://www.env.nm.gov/surface-water-quality/),
- Coordinating and/or participating in several on-the-ground restoration workshops,
- Soliciting stakeholder input of important guiding SWQB documents such as upcoming revisions to the Nonpoint Source Management Plan,
- Presenting on a variety of surface water quality issues and programs at various state and national workshops and meetings, and
- Presenting at school and community events such as the *Children's Water Festival*.

Quivira Coalition building one-rock dams to capture sediment and raise water table in slope wetlands in the Comanche Creek Watershed

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Appendices

Appendix A—Integrated List
Appendix B—Sources and Causes Tables
Appendix C—Response to Comments
Appendix D— NPS Management Program Project Tracking