State of New Mexico

Water Quality Control Commission

2010 – 2012
State of New Mexico
Clean Water Act
§303(d)/§305(b)
Integrated Report

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List of Common Acronyms

µg/L	Micrograms per Liter
ADB	Assessment Database
BMP	Best Management Practice
CERTMAN	Certification Management System
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
DDT	dichlorodiphenyltrichloroethane
DO	Dissolved Oxygen
E. coli	Escherichia coli
ECHO	Enforcement Compliance History Online Database
EDAS	Ecological Data Application System
EMAP	Environmental Monitoring and Assessment Program
EPA	Environmental Protection Agency
GIS	Geographic Information System
gpm	gallons per minute
GRTS	Grant Reporting and Tracking System
GWQB	Ground Water Quality Bureau
IR	Integrated Reporting
L	Liter
MCL	Maximum Contaminant Level
mg	Milligrams
MRG	Middle Rio Grande
NMAC	New Mexico Administrative Code
NMDGF	New Mexico Department of Game and Fish
NMDOH	New Mexico Department of Health
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes Annotated
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
ONRW	Outstanding National Resource Water
PCB	Polychlorinated Biphenyls
ppb	parts per billion
QA	Quality Assurance
QC	Quality Control
QMP	Quality Management Plan
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SDWA	Safe Drinking Water Act
STORET	Storage and Retreival System
SWCD	Soil and Water Conservation District
SWPP	Source Water Protection Plan
SWQB	Surface Water Quality Bureau
TMDL	Total Maximum Daily Load
TSI	Trophic State Index
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WQA	Water Quality Act (New Mexico)
WQCC	Water Quality Control Commission
WQMP	Water Quality Management Plan
WQS	Water Quality Standards
WQX	Water Quality Exchange

EXECUTIVE SUMMARY

Water Quality Protection in New Mexico

The protection of water quality in New Mexico is vitally important to the health and well-being of humans, aquatic life, and wildlife. *State of New Mexico Standards for Interstate and Intrastate Surface Waters* [20.6.4 NMAC] establishes designated uses for surface waters. Designated uses include fish culture, municipal and industrial water supply, domestic water supply, irrigation and irrigation storage, recreation (including cultural, religious or ceremonial purposes), livestock watering, wildlife habitat and aquatic life. To protect these uses and fulfill the requirements set forth in the federal Clean Water Act (CWA) and the New Mexico Water Quality Act (WQA) numerous programs are employed to monitor, assess, protect and restore water quality throughout the state.

Similar to most states, New Mexico has utilized a targeted, rotational watershed approach to ambient water quality monitoring since 1998 to achieve comprehensive coverage of waters of the state. This approach has best served New Mexico's monitoring objectives in the past decade given the level of financial and staff resources at the time, and has provided:

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

This is an adaptive, on-going management approach, meaning watersheds are not ignored between intensive survey years.

New Mexico's Summary of Surface Water Quality Standards Designated Use Support

Information about surface water quality throughout New Mexico is based primarily on chemical, physical, biological, toxicological, and habitat data collected during:

- New Mexico Environment Department's (NMED) rotational surveys,
- Water quality monitoring of projects under the state's Nonpoint Source Pollution Management Program,
- Total Maximum Daily Load (TMDL) surveys and studies,
- Special studies conducted to address specific localized water quality concerns,
- Preliminary statewide studies of mercury in fish tissues,
- Water quality compliance monitoring conducted under the National Pollutant Discharge Elimination System (NPDES),
- Long-term water quality monitoring collected by the U.S. Geological Survey at stream gages, and
- Review of physical and chemical data entered by various agencies into the EPA's water quality database.

Additionally, other entities are invited to contribute quality environmental data to be used for assessment purposes during a public data solicitation effort as part of the development of this report.

From approximately 7,000 categorized primarily perennial stream miles, almost 2,763 assessed miles, or 39%, have identified impaired designated or attainable uses while approximately 60,500 out of 94,000, or 64%, categorized publically-owned lake, reservoir, or playa acres do not fully support designated uses. The State of New Mexico has issued fish consumption advisories for twenty-eight lakes and reservoirs and three rivers due to elevated concentrations of various contaminants including mercury, dichlorodiphenyltrichloroethane (DDT), and polychlorinated biphenyls (PCBs).

Cause and Sources of New Mexico's Water Quality Impairments

Temperature, nutrient/eutrophication, and *E. coli* are the top three major causes of river and stream water quality impairments in New Mexico. Mercury in fish tissue, PCBs in fish tissue, and dissolved oxygen are the top three major causes of water quality impairments in lakes and reservoirs. This information is based on available data assessed against current designated, existing, and/or attainable uses utilizing New Mexico's Assessment Protocols. The vast majority of surface water quality impairments identified in New Mexico are due to nonpoint sources of water pollution. Probable sources of surface water quality impairment in New Mexico are diverse and include agricultural activities, grazing by wild and domestic animals, construction, habitat alterations, hydromodification, industrial and municipal discharges, waste disposal, storm water run-off, recreation, resource extraction, silviculture, spills, unpermitted discharges and atmospheric deposition. Rangeland grazing, source unknown (as a result of the revised approach to documenting Probable Sources discussed in Section C.3), natural sources, and loss of riparian habitat are the leading probable sources of impairment in New Mexico's rivers and streams. Atmospheric deposition, contaminated sediments, natural sources, and rangeland grazing are the leading probable sources of impairment in New Mexico's lakes and reservoirs. The probable source list included with any cause of impairment is intended to include any and all activities that could be contributing to the identified impairment. It is not intended to single out any particular land owner or single land management activity, and has therefore been labeled "Probable" and generally includes several possible items.

Nonpoint sources of pollution, predominantly household septic tanks or cesspools, are the major sources of contamination of ground water. Nonpoint source contamination may be caused by diffuse sources such as large numbers of small septic tanks spread over a subdivision, residual minerals from evapotranspiration, animal feedlot operations, areas disturbed by mineral exploration and/or storage of waste products, urban runoff, or application of agricultural chemicals. Point source contributions to ground water contamination include publicly- and privately-owned sewage treatment plants with flows over 2,000 gallons per day, dairy lagoons, mines, food processing operations, industrial discharges, landfills, and accidental spills or leaks.

New Mexico's Water Quality Management Programs

New Mexico uses a variety of mechanisms including state, federal, and/or local programs to protect and restore the quality of its surface waters. The process of correcting impairments begins with the identification of an impaired waterbody on the CWA §303(d) *List of Impaired Waterbodies*, which is comprised of all Category 5 waters on the *State of New Mexico Clean Water Act §303(d)/§305(b) Integrated List* (Integrated List). Once listed, a TMDL is developed

and incorporated into the *New Mexico Statewide Water Quality Management Plan* (WQMP). This statewide plan broadly addresses water quality concerns and serves as an important planning tool for the prevention and correction of water quality impairments.

The principal mechanism used to protect waters from municipal and industrial point source discharges is the federal NPDES program. Currently, EPA issues and enforces NPDES permits for discharges in New Mexico and the State certifies permits to ensure that New Mexico's water quality standards are met pursuant to CWA §401. The NPDES permitting process, including certification by the State, ensures that permit limits for discharges into surface waters implement federal CWA and New Mexico WQA requirements, protect state water quality standards, and implement the WQMP. Once the NPDES permit is issued, New Mexico assists EPA with permit compliance tracking and on-site inspections.

NMED administers and enforces the Utility Operator Certification regulations for the Water Quality Control Commission (WQCC) which requires that all public drinking water and wastewater treatment facilities are operated by qualified operators. In many cases, wastewater treatment facilities discharging to impaired surface waters are required to meet stringent water quality based effluent limitations that increase the complexity of the treatment facility. Having qualified operators at wastewater treatment facilities is a key factor contributing to the quality of effluent discharge to a waterbody.

The state's Nonpoint Source Management Program works to prevent and correct water quality impairments from nonpoint sources of surface water pollution. NMED is the lead agency for this program, which utilizes a variety of state, local, and federal agency programs to achieve implementation of Best Management Practices to prevent and abate nonpoint source pollution. The program annually prioritizes its efforts and waterbodies listed as impaired receive higher prioritization. As part of this program, the state ensures through the CWA §401 certification process that water quality standards are protected and the water quality management plan is implemented through the CWA §404 dredge-or-fill permits issued by the United States Army Corps of Engineers. The Wetlands Program also administers and participates in wetland restoration projects. All water quality programs have an associated outreach component to provide education and outreach for schools and interest groups wherever possible to help maintain, protect and restore New Mexico's water quality.

New Mexico relies on several programs, established under a variety of different legislative acts, to protect and maintain ground water quality. The major state statute dealing with water quality management is the WQA which specifically includes ground water within its scope. This Act created the WQCC and authorized it to adopt ground-water quality protection regulations and standards. The New Mexico Oil and Gas Act, Hazardous Waste Act, Ground Water Protection Act, Solid Waste Act, Emergency Management Act, Voluntary Remediation Act, and Environmental Improvement Act also contain provisions which are designed to protect ground water quality and which implement the ground water regulations and water quality standards directly or by reference. In addition, the state cooperates with local and federal governments on various programs relevant to ground water pollution control.

Integrated Report Highlights

In December 2009, a public hearing was held to discuss proposed surface water quality standard revisions. Written testimony was pre-filed during the fall following a public comment period, allowing parties to consider the evidence submitted by others and to reach agreement

on several issues. Changes under consideration by the WQCC include the establishment of new public water supply and coolwater aquatic life designated uses, revision to current temperature criteria, and the addition of a narrative biological criterion.

New Mexico continually searches for additional resources to enhance water quality programs throughout the state to support expanded, new, or innovative approaches to water quality monitoring. Implementing a comprehensive fish consumption advisory program, expanding lake and reservoir monitoring efforts, and enhancing rotational watershed survey monitoring efforts to enable each watershed to be examined more frequently than approximately once every eight years are all initiatives that could greatly advance the state's water quality programs.

The state has also begun to use methods to determine regional ecosystem condition using biological indicators (e.g. benthic macroinvertebrate community structure) as a tool to assess aquatic ecological condition. New Mexico continues to collect supplemental quantitative habitat information and other data to support this type of assessment approach.

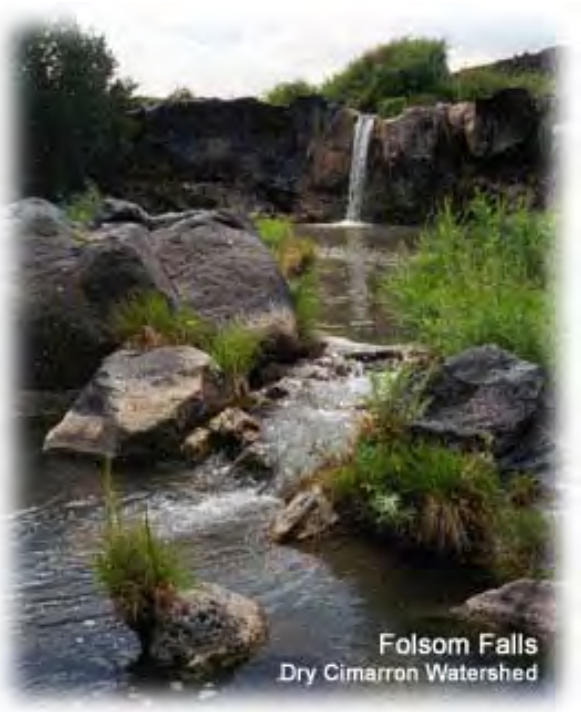
New Mexico has reestablish a state wetlands program. Revitalization of the New Mexico wetlands program will focus the state's efforts toward identifying, monitoring, assessing, protecting and restoring wetland habitats. The overall goals of the wetlands program are to protect and restore New Mexico's remaining wetlands and riparian areas and to increase self-sustaining and naturally functioning wetlands and riparian areas. To meet these goals, the program is developing and implementing an "Wetlands Action Plans" with watershed groups. The program is also completing a wetlands inventory, collecting baseline monitoring information, identifying permanent monitoring sites, and assessing the status and function of wetlands.

New Mexico's ground water resources are also of vital importance and must be preserved for present and futures generations. Approximately 90% of the total population of the state depends on ground water for drinking water. The NMED Ground Water Quality Bureau in conjunction with EPA have begun assessing the public health and environmental impacts resulting from extraction, processing, disposal and releases from legacy uranium mining and milling activities in the Grants Mining District which is located in northwestern New Mexico. In addition, NMED and EPA are developing a five-year plan in conjunction with other federal, state and tribal entities that are both regulators and land owners/managers of contaminated properties responsible for protecting human health, safety and the environment and preserving cultural and natural resources. The purpose of the plan is to identify ongoing work being performed to assess uranium mining impacts in the Grants Mining District in the northwestern New Mexico, identify future work that may be required, and serve to coordinate, guide and maximize available agency resources of the many federal, state and tribal government entities.

New Mexico has identified a number of issues of concern that affect the state's water quality management programs. These include clarifying application of the CWA, monitoring effects of nonpoint source improvements, and improving analytical methods for detection of polychlorinated biphenyls (PCBs). Congress and EPA's support and implementation of initiatives to address these issues will help New Mexico achieve the objectives of the CWA and to ensure clean water for human health and the environment.

PART A - INTRODUCTION

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



In accordance with the above stated statutory requirements, this report contains:

- An assessment of water quality;
- An analysis of the extent to which the CWA §101(a)(2) goal of surface water quality which provides for protection and propagation of fish, shellfish, and wildlife and recreation in and on the water is being achieved;
- An overview of progress in water pollution control and recommendations for further action; and
- A description of the nature of nonpoint source pollution and programs for nonpoint source pollution control.

In previous New Mexico CWA §305(b) reports and §303(d) lists, five designated use determinations were possible: Full Support, Full Support Impacts Observed, Partial Support, Not Supported, or Not Assessed. In accordance with current EPA integrated listing guidance and in an effort to streamline the reporting of water quality status, New Mexico uses the designated use determinations of Fully Supporting, Not Supporting, and Not Assessed for each individual designated use to determine an integrated reporting (IR) category for every assessment unit on the Integrated List. New Mexico's IR categories are defined in Table 1. Waterbodies classified as Category 5 constitute the *CWA §303(d) List of Impaired Waters*.

These categories document attainment of applicable water quality standards, enable the development of monitoring strategies and corrective action strategies that effectively respond to the needs identified in the assessment process, and ensure that the attainment status of each water quality standard applicable to a particular segment is addressed.

The format of this report has not changed significantly from the 2006-2008 version which was developed in accordance with EPA guidance (USEPA 2005) in order to provide a common organizational structure and method of reporting water quality status so that Congress and members of the public could more easily review reports and lists from different states. This

2010 - 2012 version adheres to the same general EPA guidance per EPA's most recent recommendations (USEPA 2009).

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, but not all of the designated or existing uses are supported based on numeric and narrative parameters that were tested.
3	There are insufficient available data and/or information to make a support determination.
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 completed.
4B	Available data and/or information indicate that at least one designated or existing use is not being supported, but a TMDL is NOT needed because other pollution control requirements are reasonably expected to result in attainment of the water quality standard in the near future.
4C	Available data and/or information indicate that at least one designated or existing use is not being supported, but a TMDL is NOT needed because impairment is not caused by a pollutant.
5A	Available data and/or information indicate that at least one designated or existing use is not being supported and necessary TMDLs are underway or scheduled.
5B	Available data and/or information indicate that at least one designated or existing use is not being supported and a review of the water quality standard will be conducted to verify appropriateness.
5C	Available data and/or information indicate that at least one designated or existing use is not being supported but additional data are necessary to verify the listing before TMDLs are scheduled.

PART B - BACKGROUND

B.1 Scope of Waters included in Integrated Report

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 total, 33.9 % is federal land, 11.7% is State land, 10.4% is Native American land, and 44.0% is privately owned (BLM 2005). The state's climate is arid to semiarid. Average annual precipitation ranges from less than eight inches in desert valleys to over 30 inches in the mountains. About half of annual precipitation is received during the period with brief but intense summer storms, commonly referred to as the "monsoon season." Much of the winter precipitation falls as snow in the high mountains and as snow or rain at lower elevations. Average annual snowfall ranges from approximately 3 inches in desert and plains regions to well over 100 inches in mountain areas. Statewide, the annual average precipitation is much less than evaporation from open water surfaces (BOR 1976).

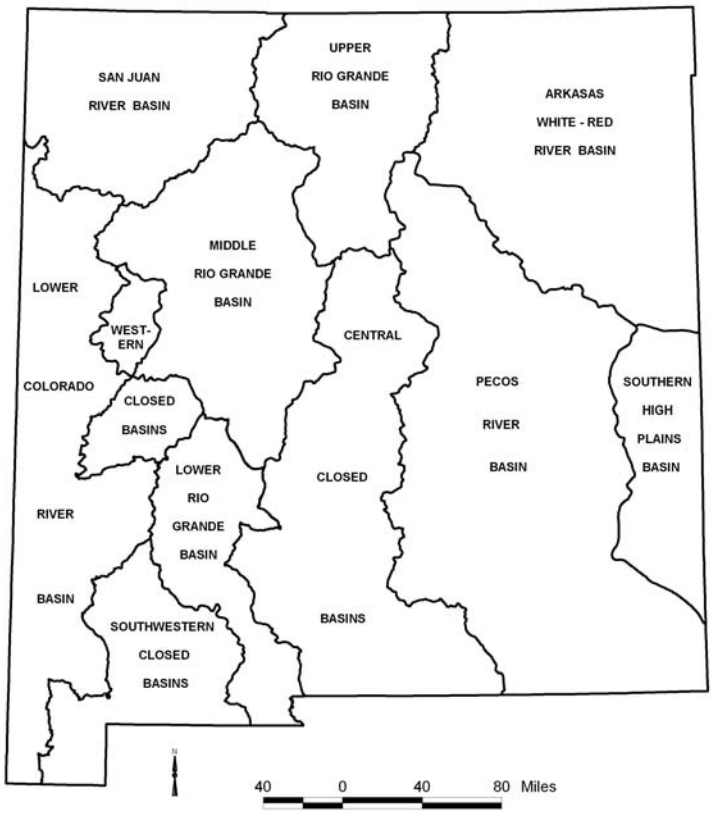


Figure 1. State of New Mexico Water Quality Basins

New Mexico's waters are located within eleven water quality basins (Figure 1). These surface waters include headwater portions of three of the nation's principal drainage systems: the San Juan River and Lower Colorado River basins contribute to the Colorado River, drainage from the Arkansas-White-Red River Basin contributes to the Mississippi River, and the three Rio Grande basins and the Pecos River basin contribute discharge to the Gulf of Mexico. Other streams in the state are in topographically closed basins and drain internally. Table 2 summarizes water resource information for the state.

Total annual stream flow averages over 5.7 million acre-feet. Precipitation falling within the state boundaries accounts for 3.3 million acre-feet of this total. Observed average precipitation for water years (October – September) during the period from 1971-2000 was 14.5 inches (NMOSE/ISC 2006). Other states, principally Colorado via the Rio Grande and the San Juan River, contribute the rest. Downstream states receive 3.6 million acre-feet from New Mexico (BOR 1976). The state's surface water supply is almost fully applied to beneficial uses under existing water rights or reserved for specified beneficial uses under water rights filings.

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

Topic	Value
State population[1]	1,984,356 people
State Surface Area[2]	121,607 sq mi
Number of water quality basins	11
Total number of stream miles[2]	108,649 mi
Perennial stream miles[2]	6,590 mi
Intermittent/Ephemeral stream miles[2]	99,332 mi
Ditch/canal miles[2]	2,727 mi
Stream miles bordering other states[2]	0 mi
Number of public lakes/reservoirs[2,3]	196
Acres of public lakes/reservoirs[2,3]	108,905 acres
Acres of freshwater wetlands[4]	740,600 acres

[1]United States Census Bureau 2008
[2]Estimates derived by SWQB are based on the lengths of arc segments and areas of polygons from the USGS National Hydrography Dataset. Established Assessment Units do not cover every waterbody in the NHD dataset. Water resource information reported by EPA may also differ from information reported by SWQB. These differences can be attributed to the different topographical map scales each agency uses to develop these estimates. Additionally, the two agencies may have used GIS information that were updated from satellite or aerial photos taken at different times.
[3]This estimate includes publically-owned cirque lakes, playa lakes, and sink holes as well as lakes and reservoirs based on the USGS National Hydrography Dataset. Large reservoir estimates are based on the conservation pool.
[4]United States Department of Agriculture Natural Resources Conservation Service (USDA/NRCS) 2000

The magnitude of ground water supplies in the state is estimated to be 20 billion acre-feet. Of this amount, an estimated three billion acre-feet of fresh water and 1.4 billion acre-feet of slightly saline water are recoverable. In some areas with significant ground water use, ground water levels have declined due to withdrawals in excess of recharge (BOR 1976).

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

Figure 2. New Mexico's Water Quality Management Framework

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

Under the authority of the WQA, the WQCC has adopted the basic framework for water quality management in New Mexico (Figure 2). A more detailed description of this framework is provided in the *New Mexico Statewide Water Quality Management Plan* (WQMP) (NMWQCC 2003). Because the WQCC has no technical staff of its own, responsibilities for water quality management activities are delegated to constituent agencies, primarily the NMED. Responsibilities for most water quality management activities involving surface waters are delegated to NMED's Surface Water Quality Bureau (SWQB).

NMED's Ground Water Quality Bureau (GWQB) is delegated responsibilities for activities involving ground water, and the New Mexico Oil Conservation Division is delegated responsibility regarding regulation of activities associated with oil and gas production. Several other state agencies conduct activities that impact water quality. These state agencies include, but are not limited to the: Office of the State Engineer; Interstate Stream Commission; Department of Game and Fish; Energy, Minerals and Natural Resources Department; Oil Conservation Commission; Soil and Water Conservation Districts; and Department of Agriculture.

Although the State currently conducts water quality planning on a statewide level, several individual program aspects are developed using a watershed-level focus in the context of the statewide planning efforts. NMED management strives to use a holistic planning and management strategy to protect or attain the desired uses and levels of water quality within a watershed. The fundamental programs within this water quality management approach are described below sections..

These programs have had significant positive impacts to the control of water pollution in New Mexico. Various qualitative and quantitative procedures have been used to measure the effectiveness and accomplishments of New Mexico's water quality management programs. However, these program assessments are influenced and complicated by the dynamic nature of aquatic ecosystems. In many instances, water quality improvements are not immediately evident due to slow vegetative growth rates and other ecological factors. Actual improvements within the water column may not be noticeable for years, or even decades. Due to this "ecological lag time," other indicators of improvement are being explored to compliment water chemistry data, such as the development of protocols to assess water quality based on biological, geomorphological, or habitat measures.

Currently, the primary means of determining the success of water quality improvements is accomplished by:

- Conducting compliance evaluations as part of the NPDES permit program, and
- Monitoring water quality trends in waterbodies where impairments were previously identified and improvement measures were implemented.

Surface Water Quality Standards Program

New Mexico's Surface Water Quality Standards Program maintains and refines the State's surface water quality standards (WQS). These WQS define the water quality goals for a waterbody by designating its uses, setting criteria to protect those uses, and establishing provisions to preserve water quality. New Mexico continually evaluates the WQS using applicable guidance documents, data, and other resources to identify areas that may need to be modified or added to refine and improve the WQS. In accordance with CWA §303(c), the state must hold a 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


Rio Nambe, high in the Pecos Wilderness

which assigns authority for the adoption of WQS to the WQCC.

The current triennial review process began formally with the release of a Discussion Draft of proposed amendments to the WQS in August 2008. NMED invited public comment on the draft and held public meetings in Carlsbad, Las Cruces, Albuquerque, Farmington and Raton. NMED filed a petition with the WQCC in December 2008. Other parties were invited to submit alternative proposals in June 2009. Written testimony was pre-filed during the fall, allowing parties to consider the evidence submitted by others and to reach agreement on several issues. The public hearing began December 8, 2009 and lasted 2.5 days, a significantly shorter duration than the 8-day 2004 triennial review hearing. The WQCC will deliberate and make decisions on the proposals at a future meeting.

Among the changes under consideration by the WQCC are the following:

- New public water supply and coolwater aquatic life uses;
- Revised temperature criteria that include lethal and sublethal thresholds for coldwater aquatic life subcategories;
- A provision for approving site-specific criteria and criteria based on natural background;
- Updates to human health criteria for 17 pollutants;
- A narrative biological criterion;
- New or revised aquatic life criteria for five metals;
- The elimination or restricted application of effluent mixing zones and compliance schedules in NPDES permits;
- Appropriate aquatic life and recreation uses for ephemeral waters and man-made ponds;
- Revised use attainability analysis provisions;
- Radionuclide criteria for monitoring and public disclosure for the Rio Grande from Taos to Cochiti Pueblo; and
- Adding classified segments for Lake Farmington, Lake Alice, Lake Montoya, Ramah Lake, the Rio Nutria, and Rio Grande (Klauer) Spring.

For more information on pending triennial review proposals, see the Hearing Officer's website at http://www.nmenv.state.nm.us/OOTS/HearingOfficer/TR2009/.

Point Source Regulation Program


El Rito Creek at Santa Rosa Municipal Discharge Pipe

Point source pollution results from discharge of contaminants through discrete conveyances such as pipes or man-made ditches. The Point Source Regulation Program is responsible for enforcing the state regulations applicable to surface water quality protection and ensures that all discharges from municipal and industrial sources are properly regulated through the NPDES permit program or under the New Mexico Regulations for Ground and Surface Waters [20.6.2 NMAC]. Currently, EPA Region VI directly administers the NPDES program in New Mexico with support from the State's Point Source Regulation Program. EPA develops, issues, and enforces the permits. The State's Point Source Regulation Program fulfills the State's responsibilities to provide review and certification of the federally-issued permit under CWA §401 which is necessary to ensure the permits are compatible with state and federal laws, protect the

State's WQS and implement the WQMP. The program also assists EPA by providing information to the EPA, the regulated community and the public and by conducting compliance inspections on behalf of EPA. Figure 3 illustrates the distribution of NPDES permitted facilities by type, followed by number of permits and percent distribution. New Mexico certified 18 permits in 2008 and 20 permits in 2009. Additionally, the state conducted 84 NPDES compliance inspections in 2008 and 137 in 2009.

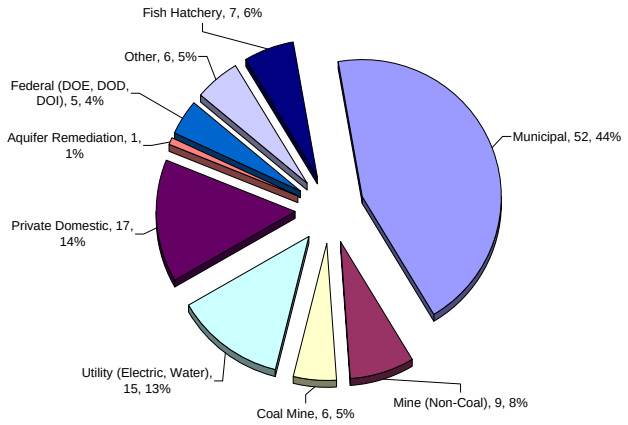


Figure 3. Distribution of NPDES Permits in New Mexico

The Point Source Regulation Program has been successful in improving and/or protecting water quality, illustrated by the fact that such a small percentage of water quality impairments identified in New Mexico's streams and rivers are attributed to point sources of water pollution. However, poorly operated or maintained treatment plants continue to cause adverse localized effects on water quality, in part due to limited funding to implement technological improvements or upgrades to treatment facilities. Figure 4 summarizes the current status of compliance with NPDES permits for New Mexico facilities (except for facilities on the Navajo Nation which are regulated by the Navajo Nation EPA and EPA Region 9) based on information obtained from EPA's Enforcement and Compliance History Online Database (ECHO). ECHO reports 32 permits for major facilities and 100 permits for minor facilities. Data are limited for minor permits in New Mexico because EPA does not enter the data for minor facilities to the same extent as major (larger) facilities. Three of the five alleged current significant violations at major permitted facilities were water-quality related.

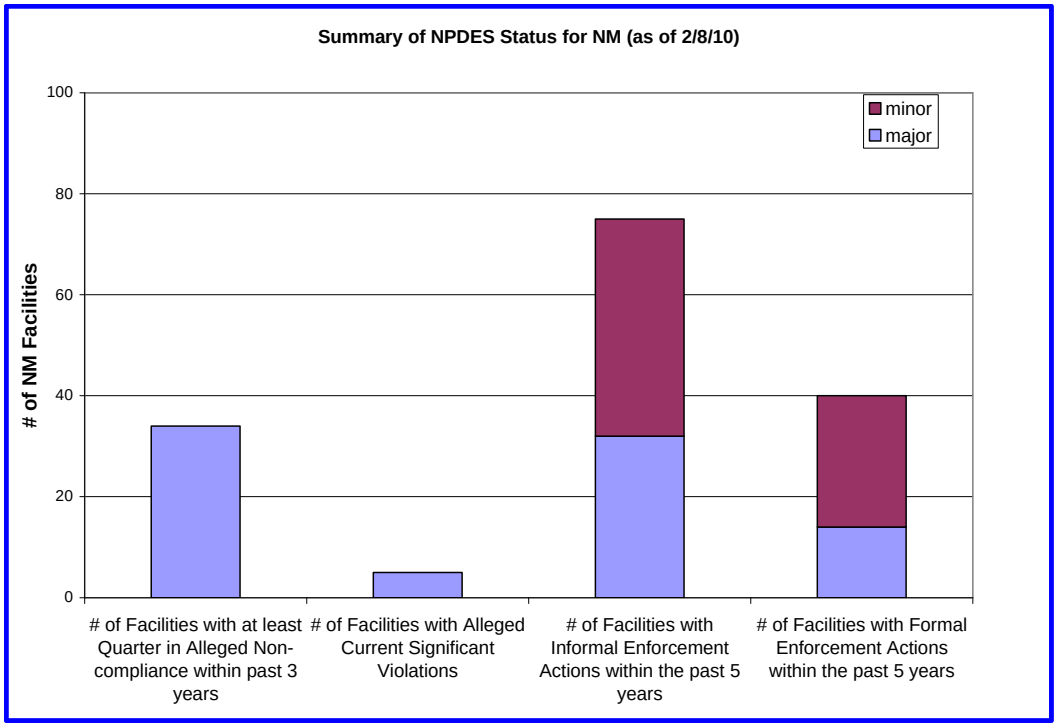


Figure 4. Summary of NPDES Compliance in New Mexico (excluding facilities on the Navajo Nation)

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

Utility Operators Certification Program

The NMED administers the Utility Operators Certification (UOC) Program pursuant to the New Mexico Utility Operator Certification Act [NMSA Sections 61-33-1 to 101]. This program is responsible for training, testing and certification of public water and wastewater system operators. In November 2009, the UOC Program unveiled a new training program called "The Operator Exchange Program." The program will allow upper-level certified operators to work in other water and wastewater facilities in the State of New Mexico while gaining training credits toward the renewal of their operator certificates. The main benefit besides the training hours is to promote the transfer of information among facilities and operators.


Las Cruces' Wastewater Treatment Facility

In November 2008, the program completed a public hearing in front of the NM Water Quality Control Commission on the revisions to the regulations specifying the minimum number of certified operators required at

water and wastewater treatment facilities. The revisions were a joint venture between NMED, stakeholders, and operators in New Mexico.

Each year, in addition to providing technical assistance, UOC Program staff provide approximately 50 hours of instruction at training events for operator certification and renewal of certification. Approximately 1,100 certificate renewal applications were processed in fiscal year 2008 and approximately 1,396 certification examination applications were processed in fiscal year 2008.

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

Nonpoint Source Management Program

The majority of water quality impairments identified in New Mexico's streams and rivers are due to nonpoint sources of water pollution. Nonpoint source (NPS) pollution can be directly related to land use practices on a broad geographic scale. NPS pollution 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, and deposits them into rivers, lakes wetlands and ground water. In New Mexico, nonpoint sources of pollution include but are not limited to: malfunctioning septic systems, hydromodification, construction activities, streambank/riparian habitat modification, roads, recreational activities, urban stormwater run-off, agriculture, grazing, silviculture/forest management, and resource extraction.

In New Mexico, the Nonpoint Source Management Program is a cooperative effort among watershed stakeholders and NMED, to educate others and implement best management practices (BMPs) to reduce the ability of nonpoint pollutants to enter surface and ground waters. An updated plan for the Nonpoint Source Management Program was developed and approved in 2009 (NMED/SWQB 2009a). The plan describes six objectives with an overall goal of meeting and maintaining water quality standards and uses of surface water and groundwater resources in New Mexico. The objectives are related to planning, restoring water quality, protecting water quality, education, protecting groundwater quality, and interagency cooperation. The plan describes long term management activities along with shorter-term milestones to be accomplished over the next five years.

The Nonpoint Source Management Program emphasizes watershed-based planning, as described in EPA's *Nonpoint Source Program and Grants Guidelines for States and Territories* (Federal Register, October 23, 2003), as a tool which should be used by any watershed restoration program intending to benefit water quality, and as a requirement for significant restoration activities to be funded with CWA §319(h) funds. The focus of such planning and implementation is on impaired waters with approved TMDLs, and on a limited group of impaired waters for which TMDL development is not required because the impairment is thought to be caused by insufficient flow (*i.e.,* Category 4C streams). Watershed-based plans are used by local watershed groups to build on the TMDL process with more detailed characterization of pollutant sources, management measures, information and education programs, and monitoring.

Since 1998, the Nonpoint Source Management Program has implemented over 100 watershed restoration projects, developed 34 Watershed Restoration Action Strategies (generally following earlier planning guidance than that summarized above) and formed 28 focused watershed groups in communities throughout the state. New Mexico currently has approximately 18 Section 319-funded planning or restoration projects in progress. Two current projects began in state fiscal year 2007, ten projects began in state fiscal year 2008, five projects began in fiscal year 2009, and eight new projects are in development or have recently begun in fiscal year 2010. See Figure 4 for examples of projects awarded or completed in 2009 in priority watersheds.

The Nonpoint Source Management Program also includes activities intended to protect water quality such as coordination with the United States Army Corps of Engineers to implement the state's CWA §401 certification responsibilities for §404 permits. One-hundred, twenty-seven CWA Section 401 water quality certifications or actions were completed in 2008 and 151 in 2009. NMED also coordinates with the New Mexico Energy, Minerals, and Natural Resources Department to implement portions of the New Mexico Mining Act pertaining to water quality.

The Nonpoint Source Management Program supports or implements several outreach activities throughout the year, including the biennial New Mexico Watershed Forum, publication of the quarterly newsletter *Clearing the Waters*, maintenance of the SWQB web pages, and presentations for school and community groups.

The program also relies on established resource protection, NPS pollution prevention programs, and activities of other land management and resource protection agencies. New Mexico identifies programs and activities that will facilitate the achievement of surface water quality criteria and uses a voluntary approach to implement water quality improvements. For example, coordination between the U.S. Forest Service and the Watershed Protection Section continues to be an integral part of the NPS Management Program and has facilitated cooperation on many NPS pollution reduction projects.

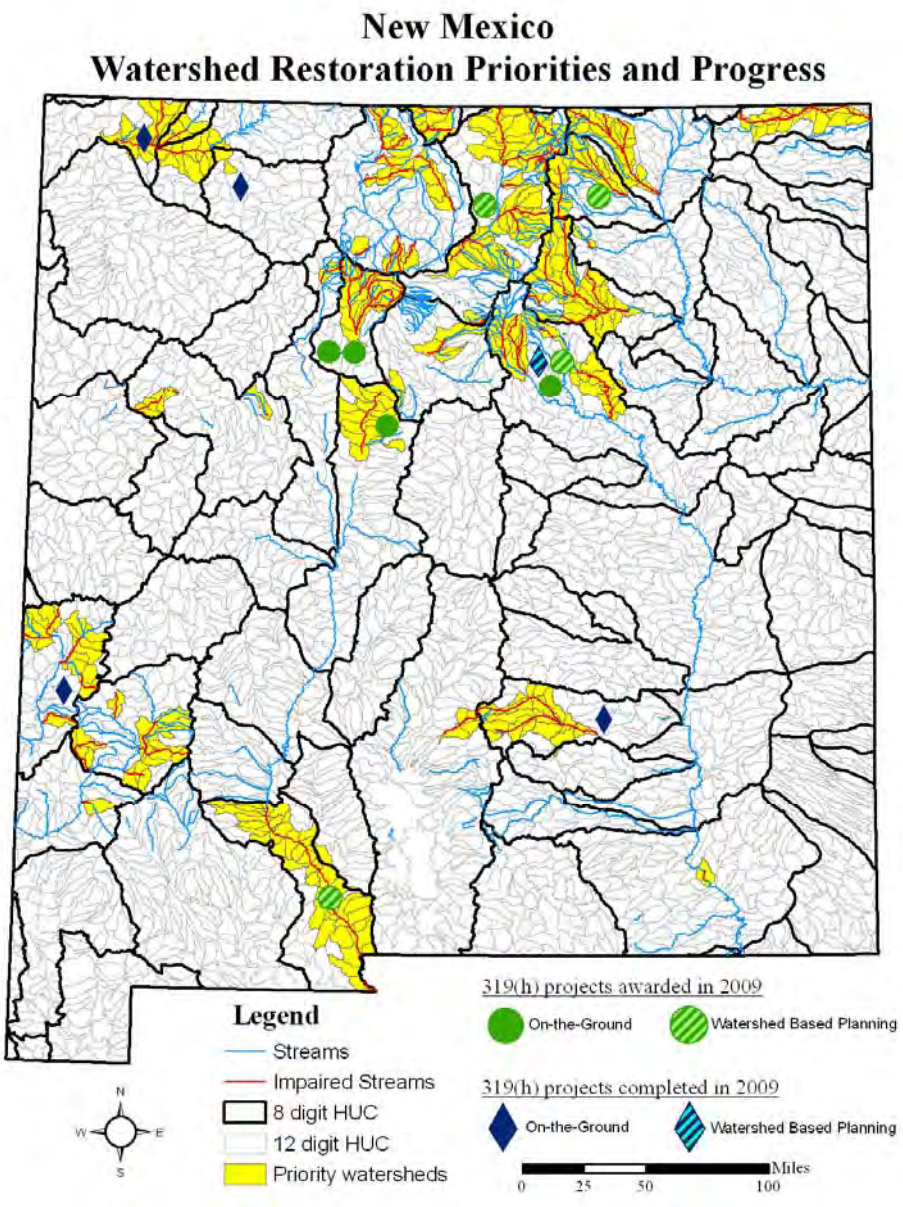


Figure 5. Watershed Restoration Priorities and Progress

The New Mexico Nonpoint Source Management Program emphasizes watershed-based planning to support coordinated watershed restoration efforts, fostering watershed associations, partnering with stakeholders, and implementing BMPs to reduce NPS pollution. Through a combination of incentive programs, partnerships, education and outreach activities, New Mexico encourages responsible parties to implement BMPs to control or reduce the degree of water quality impairments. Table 3 provides some examples of best management practices encouraged by the Nonpoint Source Management Program.

Table 3. Example BMPs implemented throughout New Mexico

NPS Pollution Category	Examples of BMPs implemented in New Mexico to address Specified Type of NPS Pollution
Grazing	• Alternate watering sources (trick tanks, upland dirt tanks, and upland wells) • Planned/rotational grazing • Fencing (pasture cross fencing and creation of additional pastures for improved stock rotation methods and riparian exclosure fencing) • Development of springs • Cattle guards • Herding • Creating ponds • Forest thinning/brush clearing
Fire Suppression/Fuels Management	• Forest thinning / fuels reduction • Post wildfire watershed rehabilitation • Meadow rehabilitation
Streambank Modification/ Hydromodification	• Streambank Stabilization - Revetment (e.g. vanes, j-hooks) - Grade control (e.g. cross vanes) - Grazing exclosures or planned grazing - Terracing / revegetation of slopes - Installing vortex weirs - Replacing culverts - Brush control
Loss of Riparian Habitat	• Habitat restoration and rehabilitation - Removal of non-native plant species - Planting native vegetation • Grazing exclosures or planned grazing
Urban Stormwater	• Education/Outreach activities • Develop stormwater management plan at local level • Propose new ordinance and/or development codes • Propose new construction standards • Install swales, French drains, detention ponds • Collect and treat runoff
Construction	• Sediment Control Structures (silt fences, hay bales, sediment retention ponds) • Heavy equipment cleaning and spill kits • Conduct construction activities during no-flow or low-flow conditions • Composted mulch berms and socks
Agriculture	• Residue Management (Contour strip cropping, stubble munching, conservation tillage) • Improved irrigation practices (low output sprinklers, tailwater recovery, vegetation control) • Agricultural Chemical Handling Facilities • Nutrient Management (split fertilizer applications, nutrient balancing, crop rotation) • Minimize pesticide impacts (biological control mechanisms, using least toxic substances, apply in accordance with label instructions and legal requirements)
Resource Extraction	• Sediment Control Structures (silt fences, hay bales, sediment retention ponds) • Treatment of acid mine drainage • Stabilizing, relocating, and channeling runoff around mine and mill tailings
Silviculture	• Road management (closures, reducing new road construction, reclaiming old roads, properly maintaining existing roads to reduce or prevent erosion, reseeding trails and landings) • Manage timber harvesting activities to protect steep slopes • Prescribing size, location, time of year, and size of harvesting activities • Erosion control structures
Septic Systems	• Identify and replace malfunctioning systems • Outreach to encourage preventative maintenance • Connect to centralized wastewater treatment system
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

New Mexico receives approximately $2,300,000 to administer and implement the Nonpoint Source Management Program through the CWA §319(h) program. These funds are enhanced through the 40% in-kind match required for all recipients of CWA Section 319(h) grants. Figure 6 depicts how funds were allocated between on-the-ground projects and watershed group formation in 2008 through 2010. It is important to note that more funds are allocated for projects as well as watershed group planning and education efforts in 2010 than in 2008 or 2009 because there are two Request for Proposal cycles reported rather than only one in previous years. Figure 7 depicts the funding distribution for projects completed in 2009. Other funding for implementation of the Nonpoint Source Management Program is obtained from a combination of federal, state, local, and private sources. Table 4 describes CWA Section 319 projects beginning in 2010.

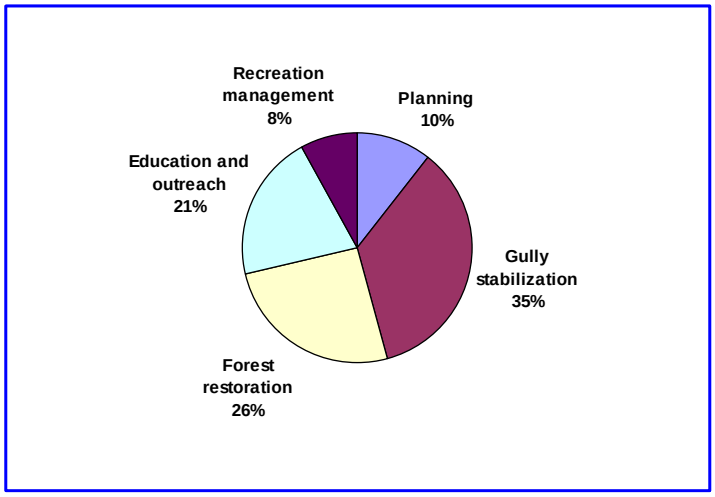


Figure 6. CWA §319(h) Funding Allocation

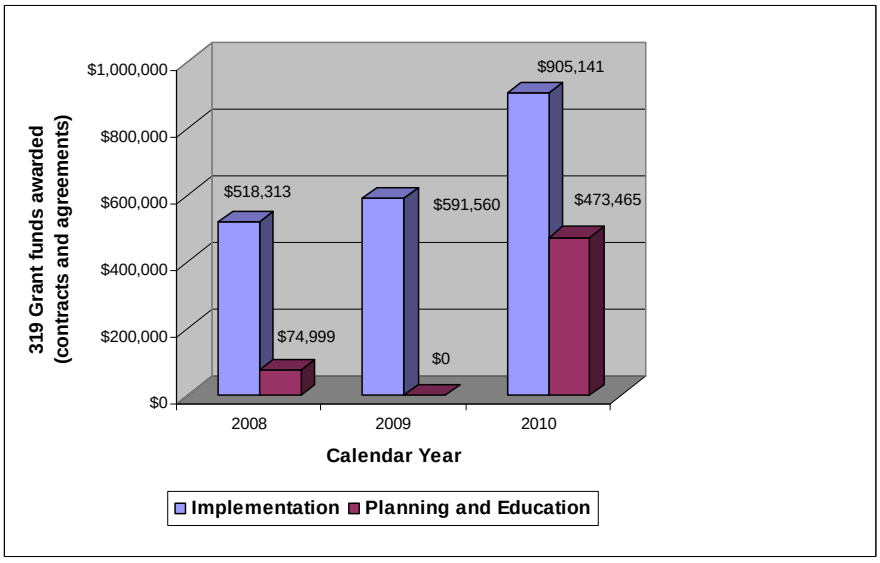


Figure 7. CWA §319(h) Funding Distribution by NPS Pollution Category, 2009

Table 4. Section 319 Projects Beginning in 2010

Project Name	Project Description	Combined Cost
Upper Pecos WRAS Improvement, Expansion, and Restoration Planning	This project will revise an existing watershed plan for the Pecos Headwaters Watershed to address the nine planning elements in EPA's Nonpoint Source Program and Grants Guidelines for States and Territories. The main focus of the planning effort will be to determine how best to implement temperature and turbidity TMDLs in 89 stream miles which do not fully support their aquatic life uses. The watershed plan will help agencies and residents focus resources on improving the trout waters of the Upper Pecos.	The Upper Pecos Watershed Association will implement this project for a combined cost (Section 319 and non-federal match) of $87,840.
Respect the Rio: Managing Recreation to Improve Water Quality	This project includes a mix of enforcement, education and restoration activities aimed at managing recreation along impaired streams in two high-use watersheds: Pecos Headwaters and Jemez. The project will build on past work in the Jemez watershed, and expand the Respect the Rio Program to the Pecos watershed.	The Santa Fe National Forest will implement the project in cooperation with several schools, national volunteer organizations, and local organizations for a combined cost of $670,271.
Río Pueblo de Taos Watershed Comprehensive Planning	This project will revise an existing watershed plan to address the nine planning elements in EPA's Nonpoint Source Program and Grants Guidelines for States and Territories, with emphasis on impaired reaches of the Rio Pueblo de Taos and Río Grande del Rancho. The revision will focus on identifying point and nonpoint sources of impairment in the watershed, estimating loading for each source, estimating load reductions for potential projects identified in the plan, and establishing a monitoring and evaluation protocol.	Amigos Bravos will implement the project for a combined cost of $104,422.
Paso del Norte Watershed Based Plan	This project will revise an existing watershed plan for the El Paso-Las Cruces Watershed to address the nine planning elements in EPA's *Nonpoint Source Program and Grants Guidelines for States and Territories* (http://www.epa.gov/owow/nps/cwact.html). The main focus of the planning effort will be to determine how best to implement TMDLs for *E. coli* in four reaches of the lower Rio Grande.	The New Mexico Department of Agriculture plans to serve as fiscal sponsor for the Paso del Norte Watershed Council, which will implement the project for a combined cost (Section 319 and non-federal match) of $423,877.
Stormwater Quality Best Management Practices and Monitoring in Bernalillo County, NM	This project has four components: 1) engineering evaluation, prioritization and construction of stormwater management measures, 2) education and enforcement activities to support responsible septage disposal practices, 3) monitoring of precipitation, stormwater flows, water temperatures, and bacteria at strategic locations, and 4) revision of the Rio Grande Albuquerque watershed plan to address the nine planning elements in EPA's NPS Guidelines.	The Ciudad Soil and Water Conservation District will implement the project for a combined cost of $368,363.
Updated Watershed Based Plan for Cimarron Watershed	This project will revise an existing watershed plan to address the nine planning elements in EPA's *Nonpoint Source Program and Grants Guidelines for States and Territories*, with emphasis on impaired reaches of Cieneguilla Creek, Middle Ponil Creek, Moreno Creek, North Ponil Creek, Ponil Creek, Rayado Creek, and Sixmile Creek.	The Cimarron Watershed Alliance will implement the project for a combined cost of $115,980.
Restoring San Antonio Creek	This project will partially address turbidity and temperature impairments within San Antonio Creek, in the Jemez watershed, using a variety of bank stabilization and upland erosion treatments. The project complements another project that is focused on improving drainage and reducing erosion caused by a pipeline road.	Los Amigos de Valles Caldera will implement the project for a combined cost of $344,056.
Respect the Rio: Managing Uplands to Improve Water Quality	This project will bring new pasture fences, non-riparian water sources, and a riparian exclosure with accompanying meadow restoration to Forest Service allotments within the upper Rio Cebolla, Rio de las Vacas, and lower San Antonio Creek subwatersheds to partially address several TMDLs within the Jemez watershed.	The Santa Fe National Forest will implement the project for a combined cost of $374,973.

By implementing the Nonpoint Source Management Program New Mexico is working to achieve measurable results of reduced NPS pollutant loadings and the resultant reduced number of NPS impaired waterbodies, successful implementation of TMDLs and watershed-based plans, and protected ground water resources for municipal, domestic and agricultural uses. Due to the widespread distribution and dynamic nature of nonpoint source pollution, reducing pollution sources requires the concerted effort of all people who spend time in the watershed. Individuals and communities must understand how human activities affect water quality and learn how to actively participate in reducing sources of pollution to protect water resources. Refer to the *New Mexico Nonpoint Source Management Program Plan* (NMED/SWQB 2009a) for additional information on how the NPS Management Program is coordinated and implemented throughout the state.

Additional information describing to the Nonpoint Source Management Program can be found in the *New Mexico Nonpoint Source Management Program* (2009).
http://www.nmenv.state.nm.us/SWQB/WPS/Plan

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

Information on projects funded through Section 319 is available on EPA's Grants Reporting and Tracking System. Current projects appear under grants awarded in federal fiscal years 2008 and 2010.
http://iaspub.epa.gov/grts/home

Effectiveness Monitoring Program

SWQB established an Effectiveness Monitoring Program in 2008, with the goal of documenting water quality changes resulting from projects implemented with incremental CWA §319 funds. An Effectiveness Monitoring coordinator was hired within the SWQB Watershed Protection Section (WPS) to implement the program.

The Effectiveness Monitoring Program is being conducted in accordance with each Project-Specific Quality Assurance Project Plan (PQAPP). Each project area is monitored for changes in water quality both upstream and downstream, and before and after implementation.

Effectiveness monitoring will be carried out within selected project areas every year for at least five years. In many cases, a series of projects will result in a longer-term monitoring effort. When the Monitoring and Assessment Section (MAS) conducts a water quality survey in the area, the survey will be tailored to supplement the effectiveness monitoring dataset, in compliance with the Quality Management Plan (NMED/SWQB 2009b). In January 2010, EPA formally recognized the restoration of the Rio Cebolla downstream of Fenton Lake as a "Clean Water Act Success Story." See below highlight box for additional information.

RIO CEBOLLA IMPROVEMENT PROJECT: A CLEAN WATER ACT SUCCESS STORY

EPA has recognized the Rio Cebolla as a "Success Story for the Clean Water Act (CWA) Section 319 Nonpoint Source Pollution Prevention Program." NMED nominated the Rio Cebolla because of river improvements realized through the Respect the Rio program conducted by the U.S. Forest Service. The Rio Cebolla originates in the Santa Fe National Forest in the Jemez Mountains. A 9.1-mile segment of the river between Fenton Lake and Rio de las Vacas was added to the 1998 CWA Section 303(d) list of impaired waters because of excessive sediment and siltation. The excess sediment and silt comes from erosion associated with recreational use, road drainage, and grazing, which can clog fish and aquatic habitats.

The Respect the Rio program used EPA 319 funding to reduce sedimentation by addressing recreation, grazing, and road issues. To reduce the impacts from recreation, the Forest Service conducted an aggressive public outreach campaign urging people to "Respect the Rio." The campaign included advertisements in local movie theaters, informational signs, pamphlets, stickers and even temporary tattoos. Furthermore, an initiative forest ranger visited people at campsites and recreational areas to encourage resource protection and cite those not in compliance.

In addition to outreach, the Forest Service built buck-and-pole fences and closed user-created roads to prevent vehicles from eroding the stream banks and hillslopes, which had been a reoccurring problem in the past. They also replaced two undersized culverts with new open-bottom culverts, which allow the stream flow to pass through without constriction and erosion problems. This also resulted in better fish passage and fish habitat. Grazing management was improved by rotating cattle in pastures and limiting access to riparian areas to two weeks a year. Also, there was an increase in the use of vehicles with trailers to transport cattle instead of driving them on horseback through sensitive areas. Additionally, old fences were replaced as needed, and upland stock tanks were constructed to relieve concentrated grazing in the riparian areas.

NMED conducted follow up water quality surveys on the Rio Cebolla in 2005, which indicated sufficient improvements to meet standards for sedimentation. Therefore, NMED removed the segment from the 2008 CWA Section 303(d) list of impaired waters.

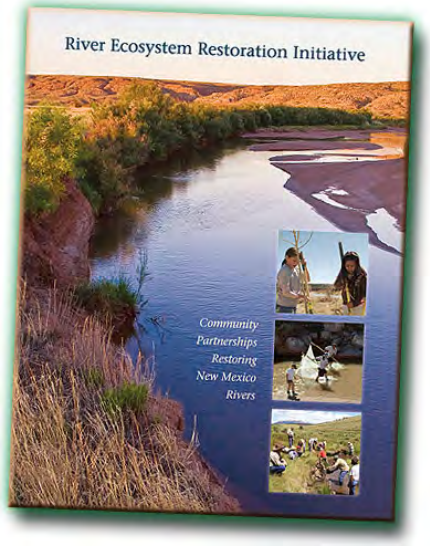
The Santa Fe National Forest received funds from NMED for several CWA Section 319 projects for the initiative. Numerous partners helped restore the Rio, including New Mexico Trout, Habitat Stamp Program, New Mexico Game and Fish, Trout Unlimited, Backcountry Horsemen, New Mexico Wilderness Alliance, individual permittees and landowners, Jemez Valley and Cuba schools, Boy and Girl Scouts of America, Student Conservation Association, Forest Trust, and Youth Conservation Corps.

For more information on this EPA Success Story, visit http://www.epa.gov/nps/success/state/nm_rio.htm.

River Ecosystem Restoration Initiative

The River Ecosystem Restoration Initiative (RERI) is an opportunity to protect and restore river systems across the state. This initiative is part of Governor Richardson's "Year of Water" legislative agenda, and is designed to sustain, re-establish and rehabilitate the integrity and understanding of New Mexico's river ecosystems through the enhancement of physical, chemical and biological characteristics. To date, New Mexico has committed $6.8 million in funding to 27 river ecosystem restoration projects, and several additional projects are under consideration.

RERI complements NMED's Clean Water Act 319(h) and Wetlands program that have the goals of improving water quality and restoring wetlands. RERI aligns directly with NMED's performance goal of addressing impaired stream miles through watershed restoration projects to improve surface water quality. Many of the contractors are local watershed groups that were previously or currently funded by CWA 319(h) funds. These groups are motivated to improve water quality but often lack the necessary funds to accomplish all the projects in their plans. RERI engages a broad and diverse set of stakeholders, including many conservation organizations, watershed groups, and multiple agency partners. More than 90 different partner organizations are involved in RERI projects.



The New Mexico legislature appropriated $2.5 million for RERI in 2007, $2.8 million in 2008, and $1.5 million in 2009. NMED has issued three Requests for Proposals for projects that restore instream ecosystem function and watershed health to major river basins. Major criteria for project selection included: the project has clear objective and measurable outcomes; is sustainable; is supported by scientific studies; is collaborative; maximizes the conservation of biological diversity; is supported by stakeholders; and includes monitoring and long-term maintenance plans. An emphasis was given to funding physical projects with the ability to show tangible results and water quality improvements. The 27 ongoing RERI projects occur on federal, state, tribal, and private land in 17 of the state's 33 counties. Major rivers and tributaries benefiting from restoration activities include the Gila River, the Rio Grande, the Rio Puerco, the Santa Fe River, the Pecos River, and the San Juan River. Current funded projects will restore 2,394 riparian acres and 33 river miles.

For more information on RERI, refer to SWQB's webpage at:
http://www.nmenv.state.nm.us/swqb/reri/

Total Maximum Daily Load Program

Under CWA §303(d)(1), states are required to develop a list of waters within the state that are not supporting their designated uses established in the WQS and to establish a TMDL for each pollutant for those "impaired waters." A TMDL planning document is a written plan and analysis established to restore a waterbody and to ensure that WQS are maintained for that waterbody. A TMDL includes consideration of existing pollutant loads and reasonably foreseeable increases in pollutant loads. TMDLs are an integral part of New Mexico's WQMP. In 1996, two citizen advocacy groups, the Forest Guardians and the Southwest Environmental Center, sued EPA to force the development of TMDLs in New Mexico. As a result, a settlement agreement and consent decree were negotiated in 1997 that established a 20-year timeline for developing TMDLs for waters identified as impaired on the 1996-1998 *List of Impaired Waterbodies* [a.k.a. *CWA 303(d) List*]. NMED received EPA approval of the final TMDL under the Consent Decree in 2007 and the Consent Decree was officially dismissed by the Department of Justice on April 21, 2009. To date, 301 actions have been taken to address impaired waterbodies through development of TMDLs or de-listing of a waterbody based on new water quality data or changes to the state's water quality standards. Since 2008, New Mexico has completed TMDLs for the Dry Cimarron River, Jemez River, and Middle Rio Grande watersheds.

Lower Rio Grande Program

The New Mexico Environment Department, NM Office of the State Engineer (OSE), and NM Interstate Stream Commission (ISC) are working cooperatively to develop solutions to concerns regarding the quantity and quality of the water delivered to the State of Texas. Elevated salinity in the Rio Grande Project area, which extends from above Elephant Butte Reservoir, New Mexico, to Fort Quitman, Texas, has long been recognized. The problems associated with elevated salinity are increasing due to rapid urban growth in the El Paso/Ciudad Juarez area, and increasing demand for potable water. Utilization of water resources in the Rio Grande Project area is restricted where highly saline water results in reduced potable water supplies, smaller crop yields, and soil and groundwater deterioration.

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

SWQB's water quality studies support recent university research that has identified natural sources as the principal salinity contributor in the area, offering hope for intercepting salinity before it impacts water supplies. In response to these findings, New Mexico's Lower Rio Grande Program initiated a multi-state effort to create a Rio Grande salinity management program, patterned after the successful Colorado River Salinity Control Forum. Lowering salinity levels in groundwater and surface water will increase available potable water supplies in the critical Texas-New Mexico border region.

NMED and ISC facilitated the formation of Rio Grande Salinity Management Coalition (Coalition) consisting of water managers, the Rio Grande Compact Commission, and water user groups from Colorado, New Mexico and Texas who are actively working together to reduce and manage salinity in the Rio Grande Project area. In 2009, NMED, ISC, and the US Army Corp of Engineers completed the first phase of a Water Resources Development Act (WRDA) Section

729 Rio Grande Salinity Management Program which included a geospatial salinity database, a USGS Rio Grande Salinity Assessment Study, and Rio Grande Economic Impact Assessment study.

For more information on Lower Rio Grande salinity issues, refer to OSE's webpage at: http://www.ose.state.nm.us/special_projects_rgpsmw_menu.html

Clean Water State Revolving Fund Program

Through the Clean Water State Revolving Fund (CWSRF) program, New Mexico maintains a revolving loan fund to provide a source of low-cost financing for a wide range of wastewater or storm drainage projects that protect surface and ground water. Funds may also be used for projects that control NPS water pollution, such as solid waste and septic tank installations.

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

The American Recovery and Reinvestment Act of 2009 (ARRA) appropriated funds to the CWSRF program in addition to annual capitalization funds. This is the first time in the program's history that program funds could be provided as grants and not just loans. As a result, $23,019,536 in ARRA subsidization is being provided to seventeen (17) communities throughout New Mexico. These funds are being used in combination with funds from the CWSRF program, State Appropriations Program, USDA Rural Utility Service, Federal appropriations, Community Development Block Grants, New Mexico Water Trust Board and community bonds to build $74,663,024 in clean water projects. Eleven (11) of the communities receiving CWSRF ARRA funds have never received a loan from the low interest program before, thus increasing the program's outreach. The other six (6) communities either currently have or have had low-interest loans from the CWSRF program, therefore increasing the benefits they receive from the program.

Other Water Pollution Control Programs

The WQA governs most of the programs that address water pollution control in New Mexico. However, because water quality is affected in so many diverse ways by so many different activities, the state has numerous other laws and programs that deal with water quality protection. The following is a list of additional programs that have a role in the protection of water quality:

- Department of Energy Environmental Oversight and Monitoring Program,
- Wastewater Revolving Loan Programs,
- Ground Water Management Program,
- Underground Injection Control and Public Water Supply Programs of the Safe Drinking Water Act (SDWA), and
- Hazardous Waste Management, Petroleum Storage Tank and Solid Waste Management programs of the federal Resource Conservation and Recovery Act (RCRA).

Coordination with Other State, Tribal and Local Agencies

What is a Stakeholder?

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

A successful watershed protection approach is founded on cooperative interaction between the federal, state, local and Tribal levels of government, and between the public and private sectors. Other state agencies that conduct activities that impact water quality include, but are not limited to: Office of the State Engineer; Interstate Stream Commission; Department of Game and Fish; Energy, Minerals, and Natural Resource Department; Oil Conservation Commission; Soil and Water Conservation Districts (SWCDs); and Department of Agriculture. Agencies responsible for implementing water quality management programs work to coordinate with appropriate stakeholders during development and implementation of water quality management activities. Coordination of water quality management activities focuses on informing and including stakeholders on water quality management related activities, seeking input, soliciting data and information, and working with stakeholders to implement solutions to water quality problems and concerns. Additionally, numerous stakeholder focus groups have been developed for specific issues and meet on a regular basis to foster coordination 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 Team and individual watershed groups' regular meetings such as the Middle Rio Grande Water Quality Workgroup.

B.3 Cost/Benefit Assessment of New Mexico's Surface Water Quality Management Programs

Protecting and conserving water quality to ensure adequate, safe and reliable water resources for the long term is a high priority for New Mexico. Each year New Mexico makes significant investments in water quality management programs and water quality improvements. The quality of the state's water resources has an impact on every citizen and impacts the potential economic growth and success of the state.

Each year states are faced with the challenge of addressing a vast array of diverse and complex water quality issues with limited financial resources. As resources become even more limited and as the complexity of environmental needs continues to expand, there is great pressure to "do more with less" in order to meet the mandates of state and federal legislative and regulatory requirements. It is therefore essential that states evaluate information regarding the fiscal implications and potential benefits of their water quality programs. The information presented in this section focuses on the water quality management programs implemented by NMED (with some supplemental outside information), and constitutes a subset of New Mexico's overall investments in water quality programs. As referenced throughout this document there are numerous additional local, state and federal resources that directly or indirectly impact the state's water quality.

Resources Applied to Water Quality Management

Investing in water quality management programs enables New Mexico to understand the status of water quality throughout the state, identify water quality problems, implement measures to address those problems and improve water quality in a systematic, organized, and economically efficient manner. Table 5 summarizes the estimated amount of funds annually spent through SWQB implementing NMED's comprehensive water quality management program. This table is based on the state fiscal year 2009, which is defined as July 1, 2008 through June 30, 2009. The changes in this table indicate a 32% decrease in federal funding as compared to the previous Integrated Report. A decrease in state funding is also noted, although it is more difficult to determine an exact percentage because the previous Integrated Report noted RERI funding for multiple years. In-kind match provided locally as in-kind support for nonpoint source and wetland projects, and by the State Laboratory Division for analysis of water quality samples, are included in this table. It is important to note that all of these costs will vary significantly from year to year. Also, beginning in 2006, the CWA §104(b)3 Grants for water quality research and investigations as well as supplemental §104(b)3 funds for TMDL development are no longer available to states, resulting in a substantial decrease in funding previously used for water quality management programs in New Mexico.

Table 5. Estimated Annual Funds Spent on New Mexico's Surface Water Quality Management Programs implemented through NMED SWQB

Water Quality Management Program	Federal	State	Total
Monitoring & Assessment Program (Includes TMDL Development, Water Quality Management Program & State Fish Advisory, Bureau of Reclamation-Middle Rio Grande Study & USFWS program)	$ 946,300	$ 482,900	**$ 1,429,200**
Point Source Regulation Program (includes NPDES and Utility Operators Certification Program)	$ 401,400	$ 678,200	**$ 1,079,600**
Nonpoint Source Management Program	$ 1,838,300	$ 354,000	**$ 2,192,300**
Wetlands Program	$ 429,100	$ 68,300	**$ 497,400**
Water Quality Standards Program (includes planning and reporting activities)	$ 119,900	$ 87,800	**$ 207,700**
NMED-Lower Rio Grande Team *	--	$ 404,300	**$ 404,300**
Governor Richardson's River Ecosystem Restoration Initiative (RERI)*	--	$ 476,300	**$ 476,300**
Total	**$ 3,735,000**	**$ 2,551,800**	**$ 6,286,800**

NOTES: The above numbers are based on NMED FY09 actual expenditures.
* = These projects are state-funded special initiatives that may or may not receive continued funding.

Capital Investments in Municipal Facilities

Table 6 summarizes the approximate annual costs for operating and maintaining various sizes of wastewater treatment facilities in New Mexico. The majority 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 and therefore, New Mexico is encouraging communities to utilize the Asset Management approach to rate setting. Asset Management is a management

Table 6. Estimated Annual Operation and Maintenance Costs for Wastewater Treatment Facilities in New Mexico

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

Source: Utility Operator Certification Program

concept that helps wastewater treatment systems prepare for both anticipated and unexpected problems by evaluating the system's current physical situation, and the system's 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 the *Asset Management: A Handbook for Small Water Systems* (USEPA 2003).

To address funding of construction and improvement costs for treatment facilities owned by municipalities, New Mexico has established a comprehensive program to provide funds (loans or grants) to local governments. The program is administered through the Construction Programs Bureau of NMED. The program is responsible for managing the timely construction and administrative completion of publicly funded water, wastewater, and solid waste projects, and ensuring that projects are environmentally sound, of high quality, and free of waste, fraud, and abuse. Investments in infrastructure to improve the quality of waste streams are a critical component of the state's water quality management program. Table 7 summarizes the programs and indicates the amounts distributed in fiscal years 2008 and 2009.

Table 7. Summary of Improvement and Construction Costs for New Mexico Wastewater Treatment Facilities

Program	Description	Funds Disbursed in FY 2008	Funds Disbursed in FY 2009
State Appropriations Program	State Legislature special appropriations for construction of community water supplies and wastewater facilities projects	(water) $17,729,194.03 (wastewater) $15,752,352.54	(water) $27,140,843.13 (wastewater) $17,582,994.18
Clean Water State Revolving Fund (CWSRF) Program	Revolving loan fund to provide a source of low-cost financing for a wide range of wastewater or storm drainage projects that protect surface and ground water quality and public health. Funds may also be used for nonpoint source water pollution control projects, such as solid waste projects and septic tank installations	$33,317,308.83	$30,079,083.23
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.	$1,143,427.24	$5,137,702.65
	Water Related Projects TOTAL	**$67,942,282.64**	**$79,940,623.19**

Benefits of the expenditures described above can be seen in direct and indirect improvements in the quality of life in New Mexico communities. The state's water quality programs, including expenditures for pollutant reducing infrastructure, result in increased public awareness regarding the need for water quality protection, 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, and sustainable resource management practices.

For more information on water and wastewater construction programs, refer to the Construction Programs Bureau webpage at http://www.nmenv.state.nm.us/cpb

B.4 Special State Concerns and Recommendations

New Mexico has identified the following significant issues within the State that affect its water quality management programs. Following the discussion of each issue is a brief description of recommendations of actions that are necessary to achieve the objectives of the CWA.

Clarifying Application of the Clean Water Act

Nationwide, states are concerned about erosion of the federal CWA authorities and the declining ability of states and EPA to protect waters that are not traditionally 'navigable.' Few of the waters in New Mexico, or in most parts of the arid southwest are navigable in the traditional sense of the word, but these waters are valuable as resources nonetheless and are vital to the health, welfare and economy of the State. In New Mexico, closed basins cover approximately 20 percent of the land area of the state. Additionally, as much as 90 percent of the state's surface waters are non-perennial. In arid states these closed basin and non-perennial waters are important resources, providing water for domestic, municipal and industrial supply, recreation, irrigation, livestock, aquatic life, and wildlife. These resources are important not only locally, but contribute significantly to interstate commerce by supporting the production and sale of goods (e.g., agricultural products) or through providing recreational (tourism) opportunities.

The state of New Mexico recommends that Congress adopt legislation to clarify protection for waters of the United States, regardless of the water's navigability. Additionally, such legislation should ensure CWA protection for the broadest range of waters, with special consideration given to the importance of non-perennial waters to arid states.

Monitoring Effects of Nonpoint Source Improvements

Congress and EPA have been moving toward measuring success of nonpoint source pollution programs (Section 319 of the Clean Water Act) based on full attainment of all designated uses. In the West, the majority of nonpoint source concerns are associated with runoff from vast areas of mountains, rangelands, irrigated farmlands, and extensive road networks. Additionally, establishment or reestablishment of adequate groundcover to prevent overland flows of sediment-laden waters is dependent upon adequate precipitation, proper land management, and other factors that may be beyond the control of water quality agencies. Depending on the specific sources of impairment, it can take decades to realize the effects of BMPs designed to control nonpoint source pollution.

Effectiveness of nonpoint source pollution prevention and restoration programs should be measured based on incremental improvements in the health of the watershed and the quality of receiving waters. Appropriate reporting tools should allow photo documentation and other qualitative assessments in addition to analytical data. Congress should allocate additional money to fund effectiveness monitoring.

Improving Analytical Methods for Detection of Polychlorinated Biphenyls

EPA has been considering approval of EPA Analytical Method 1668: Chlorinated Biphenyl (PCB) Congeners in Water, Soil, Sediment, and Tissue by high resolution gas chromatograph/ high resolution mass spectrometer. EPA's Semi-Annual Regulatory Agenda statements appear to support approval of the 1668 method. The agenda states that "[t]his method is necessary for the implementation of water quality-based permits under the National Pollutant Discharge Elimination System (NPDES) of the Clean Water Act. Water quality-based permits are necessary when technology-based controls do not ensure that a particular water body would

meet the State's water quality criteria. At present there is no EPA analytical method for determination of these PCBs at the levels of concern." The analytical methods currently approved by EPA in 40 CFR Part 136 are outdated and inadequate due to a lack of analytical sensitivity to protect federally required and approved state water quality criteria. Without adequate analytical tools, New Mexico and other states are unable to effectively protect their health-based water quality standards criterion for PCBs. New Mexico is faced with waters listed as impaired for PCBs on its CWA §303(d) list and has found it necessary to issue fish consumption advisories on the basis of PCB contamination. Unaddressed, this issue will become an ever-increasing public health concern for New Mexico and the Southwest in general. The Southwest region is experiencing extended droughts and continued population growth, and is seeing increased proposed and actual use of surface waters for municipal water supplies. Approval of Method 1668 should be straightforward because the method was developed by EPA and intended "for use in data gathering and monitoring associated with the Clean Water Act."

Congress should direct EPA to take prompt and direct action to "approve" Method 1668 in accordance with a prescribed schedule made available to states and the public. Method 1668 has been in use for more than 9 years. This method has been peer reviewed and an interlab study has been completed, resulting in minor revisions the method. Several states are using Method EPA for monitoring, assessment, and regulatory purposes.

Adequate Funding of Water Quality Programs

State and federal funding for water quality programs has decreased to a point where some basic services can no longer be sustained. Additionally, funding cuts in other agencies have a ripple effect on water quality programs. For example, budget cuts in the Department of Health (DOH) have resulted in cuts in services provided by the Department's State Laboratory Division (SLD). These cuts have reduced analytical services provided to NMED by SLD by 45 percent. Other areas where budget cuts or flat funding levels that have not kept up in inflation have reduced water quality services include ambient water quality monitoring and assessment (especially for lakes), ground water quality protection permits, field inspections, and watershed project implementation.

Congress and EPA should, at a minimum, restore federal funding for core Clean Water Act programs. Temporary funding for monitoring and assessment activities funded through American Recovery and Reinvestment Act (ARRA) funds should be made permanent. Temporary supplemental funds for Clean Water Act Section 106 programs should be made permanent. CWA §314 funds for lake monitoring and subsequent lake TMDL development should be restored.

Further Refine Probable Source Categories

EPA has requested that states use a common set of terminology to describe probable sources as provided in the Assessment Database (ADB), presumably because use of a common set of terminology allows collation and comparison of probable sources across jurisdictional boundaries. New Mexico has generally followed this request with minor modifications in response to comments on the Integrated List. The available probable sources do not provide enough meaningful information to stakeholders and land management groups to develop strategies to address the noted causes of impairment. For example, Rangeland Grazing to a very broad probable source that could have one to many specific components.

EPA should refine available probable source categories in ADB with state input.

PART C - SURFACE WATER MONITORING AND ASSESSMENT

C.1 Monitoring and Assessment Program

The state of New Mexico has adopted a ten-year surface water quality monitoring and assessment strategy. This general strategy is summarized in *State of New Mexico Summary of Surface Water Quality 10-Year Monitoring and Assessment Strategy* (2005). A revision to this strategy is currently in its final draft stage and is under review and comment by EPA (March 2010), but the general strategy remains the same as the 2005 summary. This section provides an overview of the Monitoring and Assessment Program strategy. Figure 8 describes the iterative process New Mexico implements as part of the Monitoring and Assessment Program. Surface water quality data collected during rotational water quality surveys are primarily used to implement this general framework for identifying and restoring impaired surface waters

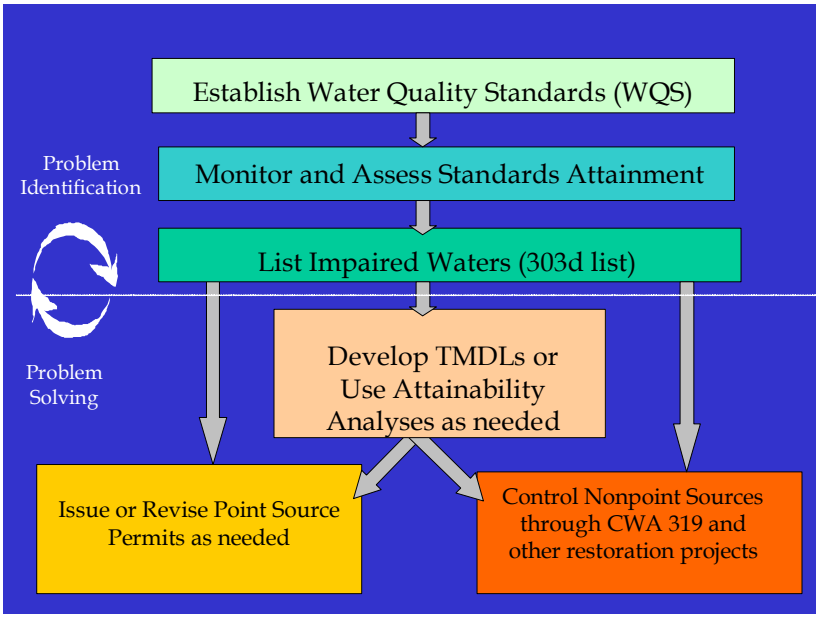


Figure 8. New Mexico's Monitoring and Assessment Process

Monitoring Program Goals

SWQB is responsible for, among other things, the management of programs to protect and improve the quality of New Mexico's surface waters. Specifically, SWQB's mission is:

- To preserve, protect and improve New Mexico's surface water quality for present and future generations through implementation of the New Mexico Water Quality Act, the federal Clean Water Act and their attendant rules and regulations (NMED/SWQB 2009c).

The goal of SWQB's monitoring activities is to answer the following five questions, in order to meet federal (USEPA 2003) and state requirements:

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

The purpose of SWQB's monitoring program is to serve all surface water quality management needs to the extent possible given available resources, NMED priorities, and strategic goals. The primary waterbody types currently monitored by SWQB's ambient water quality monitoring program include streams, rivers, lakes, reservoirs, and wetlands.

Monitoring Objectives

Clear goals and objectives are required to implement an effective monitoring and assessment program. Therefore, the first step in developing this monitoring strategy is defining a clear set of water quality management needs. These goals and needs, which must be met to address the five questions identified in section 1.2, can be placed into the following broad monitoring categories:

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

A detailed discussion of these objectives in provided in SWQB's Monitoring Strategy (final draft version , March 2010).

Monitoring Design

New Mexico's Water Quality Monitoring Program integrates targeted and fixed-station sampling designs to address the monitoring objectives and questions identified in sections above. SWQB believes that this is the most efficient combination of monitoring designs, given current funding, to meet these objectives.

Similar to most states, SWQB utilizes a targeted, rotational watershed approach to ambient water quality monitoring. This integrative watershed approach enhances program efficiency by providing:

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

Watershed surveys are developed through establishment of targeted sampling sites throughout a watershed of interest. Survey leads and co-leads ensure all necessary chemical, biological, and physical data are collected during the survey year. Pre- and post-survey planning meetings are held with other SWQB personnel working in the watershed, including PSRS, WPS, and TMDL staff. In general, SWQB strives to establish at least one sampling station in each assessment unit (i.e., identified stream reach or lakes/reservoir on the Integrated List). Exact sample site location, sampling frequency, and type of data collected are determined so as to allow determination of compliance with or variance from New Mexico surface water quality standards. This information is detailed in the QAPP (NMED/SWQB 2009c). This is an adaptive, on-going management approach, meaning a watershed will not be ignored between survey years. The proposed 8-year rotational monitoring schedule is shown in **Figure 9**.

Given the current level of financial and staff resources, SWQB considers the targeted approach is the best approach to meet New Mexico's monitoring objectives primarily because New Mexico is a large state with relatively little perennial water. SWQB has fundamentally censused the perennial waters of the state during its targeted, rotational watershed surveys. Approximately 97% of perennial stream miles have been assessed and 81% of public lake acres have been assessed to date, including 99.6% of New Mexico's large, mainstem reservoirs. The targeted approach supplemented with fixed stations and SWQB long-term monitoring sites (e.g. ecoregional reference sites) has proven effective at making broad statements regarding the status of the State's waters and fulfills monitoring objectives.

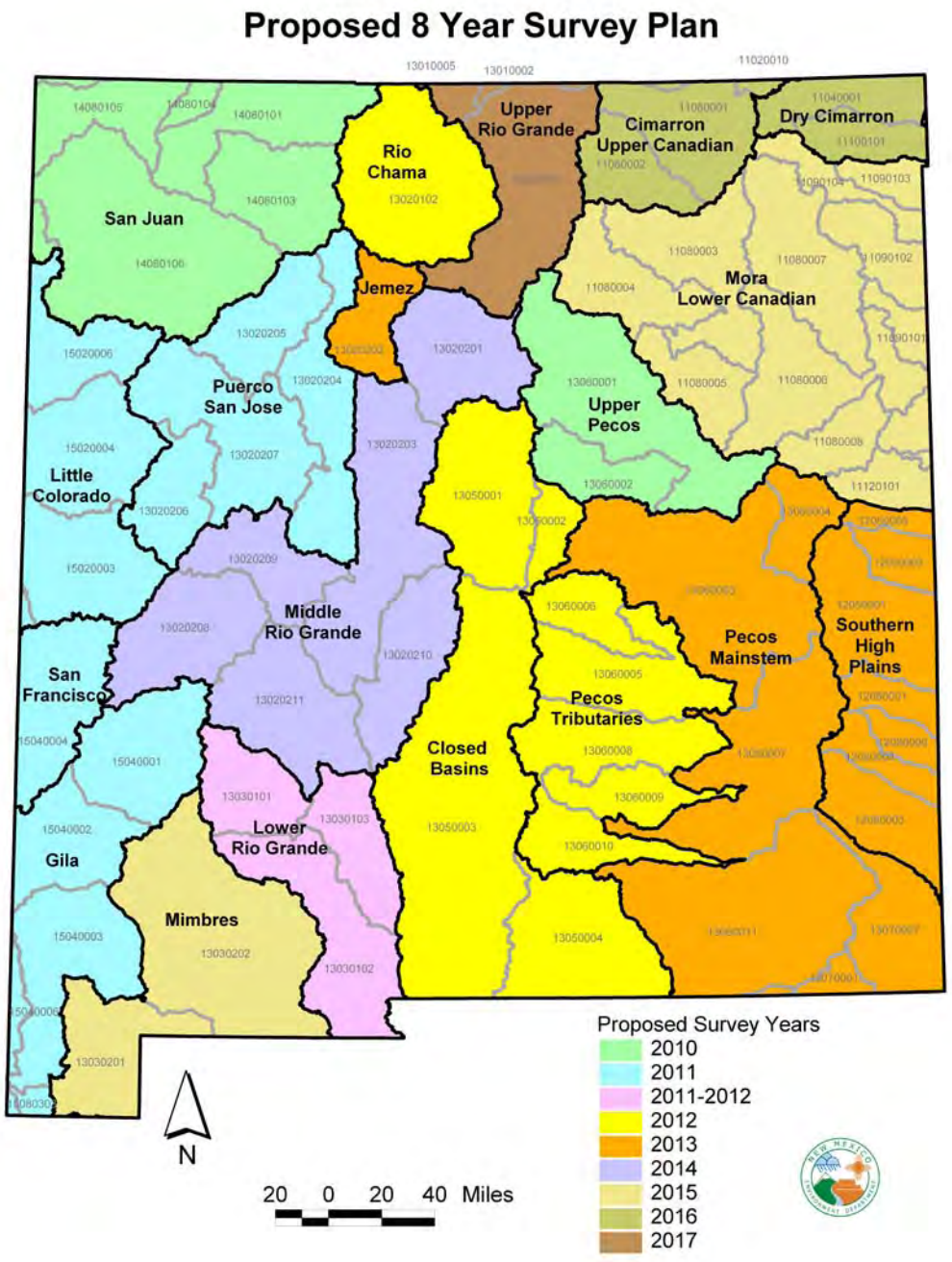


Figure 9. New Mexico's Water Quality Monitoring Schedule

The USGS, SWQB, and other cooperators such as the Office of the State Engineer, U.S. Bureau of Reclamation, and City of Albuquerque fund approximately twenty ambient monitoring stations that comprise the state's long-term water quality surveillance network. These USGS

stations are located on the major stream systems of New Mexico, and support a variety of projects across the state.

EPA has encouraged states to incorporate probabilistic sampling designs into their monitoring programs to enable states to generate statistically sound conclusions regarding the overall state of water quality. However, successful sampling of random stations in the semiarid west is challenging due to the large percentage of private land, lack of hydrologic maps that accurately indicate perennial vs. non-perennial waters, and access logistics. Although probabilistic-based monitoring can allow states to reach conclusions about surface water quality status as a whole, this type of monitoring cannot tell the state which specific water bodies are impaired or where to target CWA §319 watershed restoration funds, and do not provide the targeted data necessary for TMDL development. Accordingly, some states have begun to incorporate probabilistic monitoring into their core monitoring strategies, however a number of states including New Mexico continue to rely primarily on targeted sampling to answer these specific questions.

New Mexico's Core Water Quality Indicators

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

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

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

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

For these reasons, SWQB will continue to primarily use the targeted approach when designing water quality surveys. At this time, SWQB plans to use probabilistic sampling on a limited basis for evaluating water quality standards (WQS), researching statewide conditions to assist with the development of new WQS, and evaluating proposed regional biocriteria, as needed. SWQB is committed to continuing to look into ways to incorporate probabilistic monitoring into the overall monitoring strategy given the adequate resources to do so.

Core Water Quality Indicators

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

New Mexico's Lake Monitoring Program

Lake and reservoir monitoring in New Mexico is conducted to (1) collect information for standards development and to determine the trophic status for lakes or reservoirs where little or no physical, chemical, or biological information exits; (2) update information with regard to trophic status of previously studied lakes or reservoirs; and (3) assess for attainment of existing uses and designated uses. Lake surveys generally consist of three-season sampling efforts from one or two stations following the same rotation shown in Figure 9. Surveys for small lakes are usually conducted during the period of maximum stress to the aquatic ecosystem.

The state has identified 197 publically-owned lakes, reservoirs, and playas that cover approximately 108,900 surface acres. These waterbodies consist of large mainstem reservoirs, mountain cirque lakes, and small fishing impoundments ranging in size from less than one acre to up to 40,000 acres (Elephant Butte Reservoir at maximum storage pool). Regardless of size, all lakes are used extensively in water-scarce New Mexico. Even the smaller lakes provide drinking water for livestock watering and habitat for wildlife, are used by migratory waterfowl, or provide important recreational opportunities for boating, swimming, fishing, and aesthetic pleasure in municipal, rural, and wilderness settings.

Although all surface waters of the state are considered important, New Mexico has prioritized the following lakes, reservoirs, and playas as significant for monitoring purposes as funding resources allow:

- Lakes over twenty acres due to their many and varied uses,
- High mountain cirque lakes regardless of size because they serve as sensitive indicators of potential acidic precipitation as well as nonpoint sources of pollution,
- Lakes smaller than twenty acres where fish kills or pollutants have threatened designated use attainment, and
- Various playa lakes in New Mexico due to their unique ecological character and location in some of the most arid portions of the state.

Quality Assurance

New Mexico is committed to maintaining a quality system that provides confidence in the quality of environmental data, results and decisions produced by the various water quality programs. Water quality management programs are implemented in accordance with the most current and EPA approved version of *Quality Management Plan for Water Quality Management Programs* (QMP). The QMP documents the quality system for planning implementing, documenting, and assessing the effectiveness of activities supporting water quality management programs. All data collected by the Water Quality Monitoring Program are collected and handled in accordance with the most current version of the EPA approved *Quality Assurance Project Plan for Water Quality Management Programs* (QAPP) (NMED/SWQB 2009c). This plan describes the quality assurance procedures, quality control specifications, and other technical activities that must be implemented to ensure that the results of the project or task to be performed will meet project specifications. By establishing a quality system, New Mexico ensures that water quality management decisions are based on a systematic process and on data of known and acceptable quality. This also ensures that the public funds expended in these efforts are soundly invested.

Data Management

Numerous data management tools are utilized for the various data types and water quality management programs in New Mexico. The tools consist primarily of varying brands of database, geographic information systems (GIS), spreadsheet, statistical and word processing computer software packages. To facilitate the integration of all of these tools, waterbodies are georeferenced, or categorized, based on geographic location. Additional categories are applied to waterbodies, such as assessment unit, watershed size/area, designated uses, ecoregion, elevation, habitat type, etc., to facilitate data comparability and communication within and

among the assorted data management tools used by various water quality management programs. Once a surface waterbody has been sufficiently georeferenced and categorized, all available data and pertinent information can be integrated and used for all water quality management programs to guide water quality monitoring priorities, assessment activities and management decisions. SWQB is in the final stages of developing NMEDAS, an Oracle-based database based on EDAS2 developed by TetraTech, to house all chemical and biological water quality data. Databases currently utilized by SWQW include:

- Surface Water Quality Bureau's (SWQB) Water Quality Database – Microsoft® Access-based database application used by the New Mexico Environment Department's Surface Water Quality Bureau to house water quality data (primarily chemical, physical and flow data) collected as part of New Mexico's Water Quality Monitoring Program. This database will be replaced by NMEDAS in 2010.

- Assessment Database (ADB) - A relational database application for tracking water quality assessment data, including use attainment, and causes and sources of impairment. The ADB provides user-friendly data entry forms and automates the production of reports that New Mexico submits to EPA through the CWA Sections 303(d)/305(b) reporting process. The ADB supports three principal functions:
    - Improve the quality and consistency of water quality reporting
    - Reduce the burden of preparing reports under Sections 305(b), 303(d), 314, and 319 of the Clean Water Act (CWA)
    - Improve water quality data analysis

- Ecological Data Application System (EDAS) - A data management and analysis tool used to facilitate biological monitoring of water quality. It incorporates a range of functions from relational storage of data to calculation of metrics to the creation of export files. This database will be replaced by NMEDAS in 2010.

- STORET (short for STOrage and RETreival) and WQX (Water Quality Exchange) - The EPA data management system that contains water quality information for the nation's waters, populated with biological, chemical, and physical data on surface and ground water collected by federal, state and local agencies, Indian Tribes, volunteer groups, academics and others. All 50 States, territories, and jurisdictions of the U.S. are represented in the system. SWQB uploads all validated and verified chemical/physical data to STORET/WQX on a bi-annual basis.

- Grants Reporting and Tracking System (GRTS) - The Nonpoint Source Program's main reporting vehicle for the CWA §319 program. GRTS is a data management system that enables EPA and States to describe the progress they have made in implementing the national Nonpoint Source Pollution program. GRTS electronically tracks projects and activities funded with CWA §319(h) funds.

- Enforcement and Compliance History Online (ECHO) - EPA's comprehensive database that provides integrated compliance and enforcement information for approximately 800,000 regulated facilities nationwide. Information available through this database includes, but is not limited to: status of compliance inspections; detected violations; information regarding enforcement actions.

- SWQB's NPDES database - Microsoft® Access based database that helps the Bureau track the status of NPDES permits and the state's certification. The database contains information about individual permits in relation to waterbody assessment units for integration into Bureau projects such as TMDL development and watershed assessment/planning activities. This database does not contain all of the data available through EPA's NPDES data management systems.

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

Data Analysis/Assessment

Data are analyzed in a variety of different manners depending on the objective(s) of the analysis. Computer software packages such as Microsoft Excel and Statistica are used to examine water quality trends, relationships and results. Data are assessed against the most current version of the EPA-approved *State of New Mexico Standards for Interstate and Intrastate Surface Waters* [20.6.4 NMAC]. All data available that are considered to be of good quality are assessed to determine designated use attainment status by using the protocols described in the *State of New Mexico Procedures for Assessing Standards Attainment for the Integrated 303(d)/305(b) Water Quality Monitoring and Assessment Report* [Assessment Protocol] (NMED/SWQB 2009d). See Section C.2 below for additional details.

Reporting

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

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

Programmatic Evaluation

New Mexico, in consultation with EPA Region VI, conducts periodic reviews of each aspect of its monitoring program to determine how well each program serves its water quality decision needs. The monitoring program is evaluated to determine how well each of the program elements is addressed to determine how necessary changes and additions should be incorporated into future monitoring and funding cycles. In particular in 2007, SWQB contracted with the Midwest Biodiversity Institute to conduct a review of the biological monitoring and assessment portion of its water quality program.

New Mexico recognizes the importance of a nationally consistent approach for evaluating state monitoring programs and strives to incorporate methods and practices that support national

consistency with other state water quality monitoring efforts. Additionally, New Mexico has an extensive outreach policy that consistently involves the public, attracting input from experts from other government agencies and academic institutions on how the program functions.

General Support and Infrastructure Planning

Currently New Mexico receives sufficient resources to support a basic monitoring program that enables all watersheds to be intensively monitored approximately once every eight years with a limited amount of supplemental monitoring for special projects or emergency situations. Each year the state strives to monitor two to three watersheds.

Additional resources would allow SWQB to:

- Incorporate probabilistic sampling designs components into the statewide monitoring strategy,
- Collect more data to update and maintain the fish consumption advisory program,
- Restore NPDES compliance monitoring activities,
- Expand lake and reservoir monitoring efforts,
- Refine and expand numeric translators for nutrients, bottom deposits, and benthic macroinvertebrate bioassessments,
- Refine monitoring methods and assessment protocols for non-wadeable rivers,
- Shorten the assessment return interval to a 5-year rotational cycle, and
- Contract with non-government analytical laboratories to increase the scope of analyses conducted and to replace services that had been provided by SLD.

C.2 Assessment Methodology

The assessment methodology described in the *State of New Mexico Procedures for Assessing Standards Attainment for the Integrated §303(d)/§305(b) Water Quality Monitoring and Assessment Report* [*Assessment Protocol*] (NMED/SWQB 2009d) constitutes the decision process that New Mexico employs to determine which attainment category a segment belongs. The *Assessment Protocol* describes how all readily available data and information are identified and considered, the basic quality assurance (QA) and quality control (QC) criteria used to evaluate outside sources of data, and the analytical approaches used to infer segment condition. The assessment methodologies described in the *Assessment Protocol* are reviewed each reporting cycle to ensure the methods are consistent with applicable water quality standards, incorporate new guidance provided by EPA, and clarify assessment protocols. For the 2010-2012 reporting cycle, enhancements included inclusion of an interim turbidity assessment protocol and additional clarification on the application of chronic aquatic life criteria for assessment purposes.

Each time the *Assessment Protocol* is significantly revised, or every other listing cycle regardless of significant changes, the public has an opportunity to provide comments through the public participation process that includes a minimum 30-day public comment period with proper notification. The *Assessment Protocol* used to develop the 2010-2012 Integrated List (Appendix A) were released for public comment.

All readily available data less than five years old are used to determine whether the applicable water quality standards are attained. Data greater than five years old may also be considered on a case-by-case basis. Outside sources of data are solicited via a public notice process prior to developing the CWA §303(d) *List of Impaired Waterbodies*. All data submitted from outside sources must meet the state's QA/QC requirements to be used in the water quality standards attainment decision process.

The types of data considered in the water quality standards attainment decision process include, but are not limited to the following and must meet the state's QA/QC requirements:

- NMED SWQB chemical, physical, biological, habitat, or toxicological monitoring data collected during rotational watershed surveys using approved or otherwise accepted quantitative methods;
- Chemical/physical data from recent studies by NMED or other organizations, contractors, or individuals;
- USGS water quality data that have met USGS QA/QC requirements (i.e., provisional data will not be used to make use determinations);
- Benthic macroinvertebrate, fish community, and/or fish tissue data collected by NMED or other organizations, contractors, or individuals;
- General Aquatic Wildlife Survey, Rapid Bioassessment Protocols, Thalweg-Watershed Area Link, or other biological/habitat data collected by NMED and other organizations, contractors, or individuals;
- NPDES Discharge Monitoring Report data;
- NPDES storm water permit compliance monitoring data;
- In-stream water quality data from other NMED bureaus such as the Drinking Water, Ground Water, and/or Department of Energy Oversight bureaus;
- Citizen or volunteer monitoring data from a program with a state approved QA/QC plan.

New Mexico's Lake Nutrient Assessment Development

Goose Lake

New Mexico conducted a total of thirty-three lake water quality surveys on a wide range of large reservoirs, small reservoirs, sink holes, and high mountain cirque lakes during the 2006 and 2007 sampling seasons to provide information on these differing lake types. Data were collected for use attainment determinations as well as SWQB's nutrient criteria development efforts. As a result of this data collection effort and SWQB's substantial lake dataset, a *Draft Nutrient Assessment Protocol for Lakes and Reservoirs* was completed in January 2010 and sent to EPA Region 6 for review.

C.3 Water Quality Assessment Results

As encouraged by EPA, New Mexico has housed assessment information in the EPA-developed ADB for the last several listing cycles. Use of this database allows SWQB to automatically generate the complete Integrated List and the Category 5 *CWA §303(d) List of Impaired Waters*, as well as a variety of cause, source, and impairment category summary reports. The results are organized by water body type (Rivers/Streams followed by Lakes/Reservoirs) and presented in the following sections.

Rivers and Streams

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

Table 8. Integrating Reporting Categories for New Mexico's Rivers and Streams

Category	Total Size (miles)	Number of River/Stream Assessment Units
1	694.16	36
2	1,774.43	152
3	727.59	72
4A	858.11	57
4B	0	0
4C	181.35	11
5	2,763.47	181

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

New Mexico's surface waters assigned to one of the five integrated reporting categories as defined in Table 1 are summarized in Table 8. Individual IR categories are presented for every assessment unit on the Integrated List in Appendix A.

The second largest grouping of assessed lotic (i.e., flowing) assessment units in New Mexico fall under Category 2. These 152 assessment units cover approximately 1,775 stream miles. Assessment units are listed in this category if there are data and information that meet requirements of the assessment and listing methodology to support a determination that some, but not all, uses are attained based on numeric and narrative water quality criteria that were tested. Attainment status of the remaining uses is unknown because there are no reliable monitored data with which to make a determination.

The largest grouping is Category 5 waters. These 181 assessment units cover approximately 2,763 stream miles. These assessment units, along with the Category 5 lake/reservoir water bodies, comprise New

Mexico's CWA §303(d) waters. A list of Category 5 only waters was generated from ADB and is included in Appendix A.

TMDL planning documents have been developed for 57 stream reaches in New Mexico that are still noted as impaired, covering approximately 858 stream miles. Several of these stream reaches have TMDLs for more than one parameter. There are 72 stream reaches (covering approximately 728 miles) noted as Category 3. Assessment units are listed in this category when data to support an attainment determination for any use are not available according to the requirements of the state's assessment and listing methodology. Reasons for this generally include access issues, monitoring and/or analytical logistics (such as the need for automated sampling equipment), as well as staff and financial constraints.

All of New Mexico's TMDLs are incorporated into the state's Water Quality Management Plan (WQMP) and available on the SWQB web site: http://www.nmenv.state.nm.us/swqb/TMDL/index.html.

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

New Mexico's water quality standards designated use summaries for each river/stream assessment unit are presented in Table 9. These results are primarily based on water quality monitoring conducted by the NMED as part of intensive watershed surveys, fixed station monitoring and targeted monitoring. These data are supplemented by outside sources of data shown to be of sufficient quality.

In New Mexico, the CWA goal of "fishable" is now reported under the various aquatic life uses currently in New Mexico's WQS (20.6.4. NMAC), and the "swimmable" goal is reported under primary and secondary contact uses. EPA developed this method through a consensus approach to reduce inconsistencies in states' reports. Overall, 12 of the state's 16 assessed designated uses in streams and rivers have been identified as impaired by point and/or nonpoint sources of pollutants.

Table 9. Designated Use Support for New Mexico's Rivers and Streams (Reported in miles)

Designated Use	Total Size	Size Assessed	Size Fully Supporting	Size Not Supporting	Size Not Assessed
Coldwater Aquatic Life	962.25	746.2	276.68	469.52	216.05
Domestic Water Supply	2,575.3	2,215.86	2,149.32	66.54	359.44
Fish Culture	1,957.93	1,807.88	1,807.88	0	150.05
High Quality Coldwater Aquatic Life	2,521.29	2,225.81	733.63	1,492.18	295.48
Industrial Water Supply	1,113.88	1,001.75	1,001.75	0	112.13
Irrigation	6,202.99	5,583.18	5,505.64	77.54	619.81
Irrigation Storage	12.32	12.32	12.32	0	0
Limited Aquatic Life	81.74	72.13	2.52	69.61	9.61
Livestock Watering	6,999.11	4,804.18	4,712.24	91.94	2,194.93
Marginal Coldwater Aquatic Life	1,016.78	1,002.7	473.56	529.14	14.08
Marginal Warmwater Aquatic Life	1,980.37	1,614.94	937.05	677.89	365.43
Municipal Water Supply	918.79	815.41	815.41	0	103.38
Primary Contact	1,328.51	258.48	235.25	23.23	1,070.03
Secondary Contact	5,841.84	2,799.14	2,094.04	705.1	3,042.7
Warmwater Aquatic Life	1,512.47	1,318.66	794.71	523.95	193.81
Wildlife Habitat	6,999.11	6,047.15	5,971.65	75.5	951.96

Causes of Surface Water Impairment for Rivers and Streams

New Mexico's impairment cause summary for river/stream assessment units are presented in Figure 10. These are primarily based on water quality monitoring conducted by the NMED as part of intensive watershed surveys, fixed station monitoring and targeted monitoring. These data are supplemented by outside sources of data shown to be of sufficient quality. The ADB-generated summary report is provided in Appendix B. Standard EPA cause categories included in ADB were used to label the graphic. See the above-referenced appendix for subcategory information.

Excessive temperature, nutrient/eutrophication biological indicators, and *Escherichia coli (E. coli)* are the identified the top three causes of impairment of designated uses in New Mexico's streams and rivers based on current WQS, available data, and current assessment procedures. Aluminum is also a primary cause based on the current chronic criterion of 0.87 µg/L. It is believed that this criterion may not be achievable in many areas of the state where aluminum is naturally occurring in highly erodible geology. New Mexico discussed this issue at the most

recent triennial review, and potential changes to aluminum criteria are pending. The noted dissolved oxygen (DO) and nutrient/eutrophication impairment may be somewhat redundant as one of the potential results of excessive nutrients and enrichment is lower DO. SWQB is currently implementing several nutrient criteria development projects that in part will address this redundancy in the future through improved monitoring and assessment methodologies. SWQB also plans to revisit the current sedimentation/siltation assessment protocol to attempt to improve impairment determinations due to sedimentation.

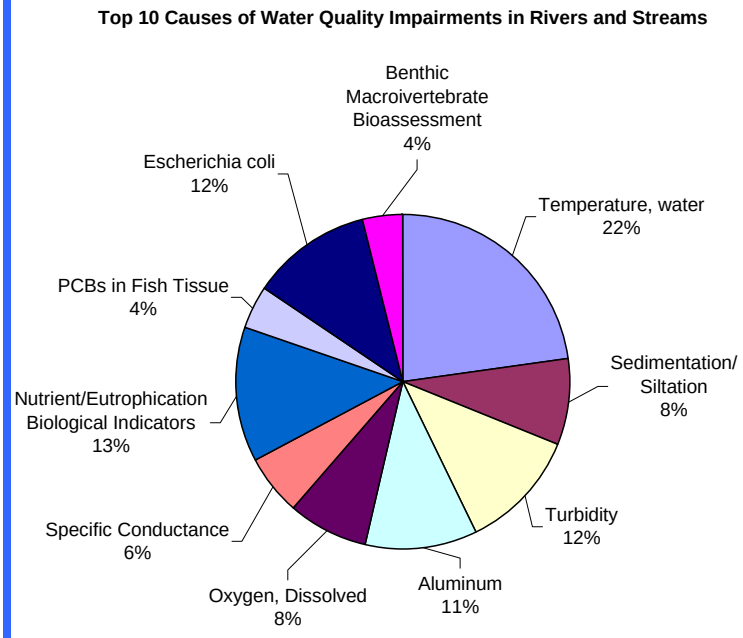


Figure 10. Causes of Surface Water Impairment for New Mexico's Rivers and Streams

Cause of Impairment (Subcategory from ADB)	Stream Miles Impaired
Temperature, water	1,328.75
Sedimentation/Siltation	487.92
Turbidity	673.62
Aluminum	639.09
Oxygen, Dissolved	442.12
Specific Conductance	341.75
Nutrient/Eutrophication Biological Indicators	758.35
PCBs in Fish Tissue	238.28
Escherichia coli	678.73
Benthic Macroinvertebrate Bioassessment	234.31

NOTE: See Appendix B for complete list of categories and subcategories generated from ADB.

The associated water quality criteria for contact use support were changed from fecal coliform to *E. coli* during the 2005 triennial review. These historic fecal coliform listings will be retained until *E. coli* data are collected to determine whether there is any impairment of contact uses. *E. coli* data must be collected before TMDL development can occur. SWQB has been actively sampling *E. coli* during watershed surveys since the 2006 listing cycle with a mobile *E. coli* sampling unit that resolves the 6-hour holding time issue. Implementation of this sampling method has resulted in the identification of more contact use impairment than during previous listing cycles.

Sources of Surface Water Impairment for Rivers and Streams

New Mexico's impairment source summary for river/stream assessment units are presented in Figure 11. These are primarily based on staff observation and other information as described in earlier sections. The ADB-generated report that was used to generate the below figure is

included in Appendix B. Standard EPA cause categories included in ADB were used to label the graphic. See the above-referenced appendix for subcategory information.

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

The approach for identifying “Probable Sources of Impairment” was modified by SWQB starting with the 2010 listing cycle. Any new impairment listing will be assigned a Probable Source of “Source Unknown.” Probable Source Sheets will continue to be filled out during rotational watershed surveys and watershed restoration activities by SWQB staff. Information gathered from the Probable Source Sheets will be used to generate a draft Probable Source list in consequent TMDL planning documents. These draft Probable Source lists will be finalized with watershed group/stakeholder input during the pre-survey public meeting, TMDL public meeting, watershed-based planning activities, and various public comment periods. SWQB has also created a web site to further solicit input on Probable Sources (found at http://www.nmenv.state.nm.us/swqb/PS/). The final Probable Source list in the approved TMDL process will be used to update the subsequent Integrated List.

For development of the Integrated List, identified probable sources are incorporated into the Assessment Database (ADB) where they are quantified based on the stream lengths for each assessment unit identified with a classification of a particular probable source of impairment. ADB generates summary reports that break down sources of impairment into major and sub-categories. This complete report is contained in Appendix B. In most instances, more than a single source contributed to water quality impairment.

Rangeland grazing, source unknown (as a result of the revised approach to documenting Probable Sources noted above), natural sources, and loss of riparian habitat are the leading probable sources of impairment in New Mexico’s rivers and streams. Natural sources could include contributions from the surrounding geology, wildlife grazing, impacts from waterfowl, temporary or prolonged drought, etc. These occurrences are believed to contribute to localized water quality problems in certain areas of the state.

On-site treatment systems (such as septic tanks) are noted as a source of impairment. These primarily domestic systems can lead to water quality problems if they are installed in close proximity to other systems, improperly installed or poorly maintained. To help address this problem, state regulations applicable to the treatment and disposal of small volumes of domestic wastewater (2000 gallons per day or less) were significantly revised, effective July 2005. Additional minor amendments took effect April 2007. See the section entitled “Updated Liquid Waste Regulations” for details.

Consistent with other western states, point source discharges play a quantitatively minor role in the impairment of the state's streams and rivers compared to nonpoint sources. The vast

majority of all water quality impairment identified in New Mexico's streams is due to NPS water pollution. While poorly operated or maintained treatment plants may have severe adverse localized effects on water quality, the available data indicate that the state, working with EPA and permittees, has been largely successful in reducing point source impacts on the state's surface waters.

Sources of Impairment (Subcategory from ADB)	Stream Miles Impaired
Rangeland Grazing	2,083.75
Loss of Riparian Habitat	943.24
Natural Sources	1,095.63
Streambank Modifications/Destablization	746.81
Highway/Road/Bridge Runoff (Non-construction Related)	533.54
Flow Alterations from Water Diversions	686.69
Source Unknown	1,302.47
On-site Treatment Systems (Septic Systems and Similar Decencentralized Systems)	609.26
Municipal Point Source Discharges	637.63
Recreation Related (Incl. Off-Road Vehicles)	454.80

NOTE: See Appendix B for complete list of categories and subcategories generated from ADB.

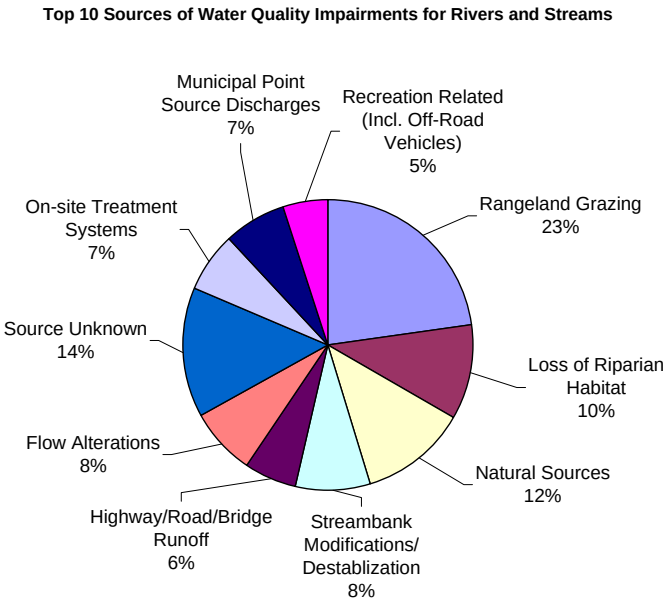


Figure 11. Sources of Surface Water Impairment for Rivers and Streams

Lakes and Reservoirs

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

The development of an adequate monitoring and assessment program for lakes still lags far behind New Mexico's river and stream monitoring programs. One major challenge regarding both lake monitoring and subsequent lake TMDL development has been the loss of specific CWA §314 funds. In the past, states received this funding specifically targeted for lake monitoring, such as for the playa study previously mentioned. Now states must carve out adequate funding for lake monitoring from their core CWA §106 funds. SWQB needs to acquire the resources to increase lake and reservoir monitoring in order to prepare for subsequent TMDL development and to provide water quality information to the public who utilize these lakes and reservoirs. A more robust program is needed to confirm the current cause and source impairment information regarding lakes and reservoirs with more scientifically-rigorous quantitative data and information.

Table 10. Summary of Impairment Reporting Categories for New Mexico's Lakes and Reservoirs

Category	Total Size (acres)	Number of Assessment Units
1	5,969.52	15
2	7,487.07	37
3	20,095.4	110
4A	0	0
4B	0	0
4C	0	0
5	60,502.91	34

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

Table 10 shows the number of New Mexico's lakes and reservoirs assigned to each IR categories as defined in Table 1. Individual IR categories are presented for every assessment unit on the Integrated List in Appendix A.

Over 20,000 acres (110 lakes or reservoirs) are grouped under Category 3. Assessment units are listed in this category when current data to support an attainment determination for any use are not available, consistent with requirements of the state's assessment and listing methodology. Reasons for this generally include access issues, monitoring and/or analytical logistics, as well as staff and financial constraints. SWQB has resolved the problem of 6-hour holding times by implementing a method to perform *E. coli* analyses in the field with a mobile testing unit. Many of these lakes that are "Not Assessed" are very small in size, such as high elevation cirque lakes. These types of lakes are logistically difficult to sample because they require long, steep hikes. SWQB sampled a representative subset of cirque 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 where adequate resources have not been available to re-monitor in more recent years was changed to "Not Assessed" during the 2008 listing cycle because these data were over 15 years old.

By size, the majority of assessed lentic (i.e., not flowing) assessment units in New Mexico fall under Category 5. These 34 waterbodies comprise approximately 60,000 acres. Over 90% of these acres are freshwater reservoirs vs. natural lakes. New Mexico has very few natural lakes compared to on-line and off-line reservoirs. These assessment units, along with the Category 5 river/stream water bodies, comprise New Mexico's CWA §303(d) waters. A list of Category 5 only waters was generated from ADB and is included in Appendix A. New Mexico has not yet begun developing lake TMDLs, as noted by the fact that no lakes or reservoirs are displayed under Category 4A. Upon completion of the few remaining TMDLs in the settlement agreement, SWQB plans to explore the feasibility of developing lake TMDLs.

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

New Mexico's WQS designated use summaries for each lake/reservoir assessment unit are presented in Table 11. These results are primarily based on fixed station water quality monitoring conducted by the NMED as part of rotational watershed surveys, as well as best professional judgment and qualitative assessments. These data are supplemented by outside sources of data shown to be of sufficient quality. Overall, 6 of the state's 17 assessed designated uses in lakes and reservoirs have been identified as impaired by point or nonpoint sources of pollutants.

Table 11. Individual Designated Use Support Summary for New Mexico Lakes and Reservoirs (Reported in acres)

Designated Use	Total Size	Size Assessed	Size Fully Supporting	Size Not Supporting	Size Not Assessed
Coldwater Aquatic Life	31,335.45	31,078.05	5,907.6	25,170.45	257.4
Domestic Water Supply	2,401.77	2,239.49	905.68	1,333.81	162.28
Fish Culture	2,434.52	2,276.74	2,276.74	0	157.78
High Quality Coldwater Aquatic Life	1,794.06	1,653.19	273.49	1,379.7	140.87
Industrial Water Storage	13,151.19	13,151.19	13,151.19	0	0
Industrial Water Supply	5,585.58	5,422.44	5,422.44	0	163.14
Irrigation	13,732.45	12,889.02	12,889.02	0	843.43
Irrigation Storage	47,574.89	47,574.89	47,574.89	0	0
Livestock Watering	94,054.9	66,468.05	66,468.05	0	27,586.85
Marginal Coldwater Aquatic Life	967.16	816.59	599.38	217.21	150.57
Marginal Warmwater Aquatic Life	24,764.73	1,634.78	6.05	1,628.73	23,129.95
Municipal Water Storage	13,151.19	13,151.19	13,151.19	0	0
Municipal Water Supply	6,570	6,367.5	6,367.5	0	202.5
Primary Contact	89,140.55	60,561.11	60,561.11	0	28,579.44
Secondary Contact	5,040.33	3,761.81	3,761.81	0	1,278.52
Warmwater Aquatic Life	58,011.39	55,323.49	1,343.55	53,979.94	2,687.9
Wildlife Habitat	94,054.9	73,935.69	73,935.69	0	20,119.21

Causes of Surface Water Impairment for Lakes and Reservoirs

New Mexico's impairment cause summary for lake/reservoir assessment units are presented in Figure 12. These are primarily based on water quality monitoring conducted by the NMED as part of rotational watershed surveys, fixed station monitoring and targeted monitoring. These data are supplemented by outside sources of data shown to be of sufficient quality. The ADB-generated report that was used to generate the below figure is included in Appendix B. Standard EPA cause categories included in ADB were used to label the graphic. See the above-referenced appendix for subcategory information.

Cause of Impairment (Subcategory from ADB)	Acres Impaired
Mercury in Fish Tissue	52,064.02
Nutrient/Eutrophication Biological Indicators	4,412.94
Arsenic	1,668.57
Aluminum	3,767.75
DDT in Fish Tissue	3,058.67
Copper	11.6
Oxygen, Dissolved	11,424.31
PCB in Fish Tissue	17,680.33
pH	159.31
Temperature, water	187.45

NOTE: See Appendix B for complete list of categories and subcategories generated from ADB.

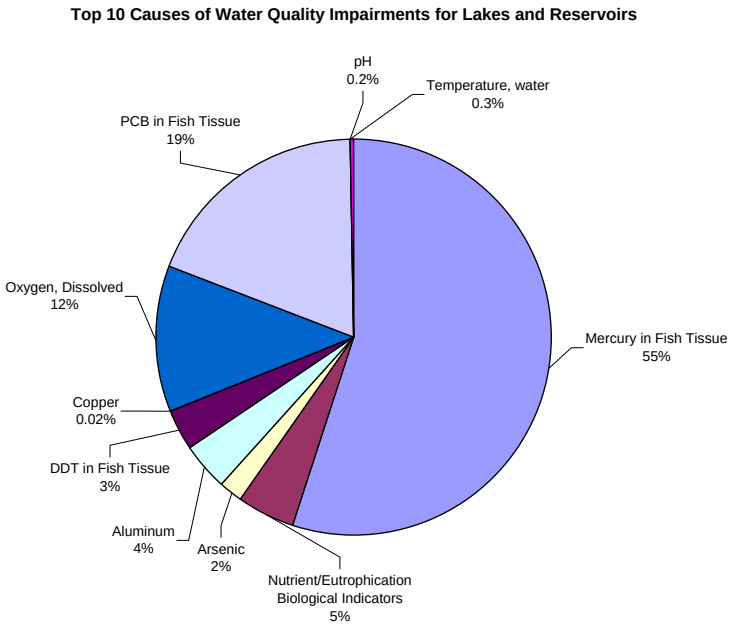


Figure 12. Causes of Surface Water Impairment for Lakes and Reservoirs

Mercury in fish tissue, PCBs in fish tissue, and dissolved oxygen are the identified major causes of impairment of designated uses in New Mexico's lakes and reservoirs based on current WQS, available data and current assessment procedures. Per EPA guidance, 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), USEPA 2005). New Mexico currently has fish consumption advisories based on mercury, dichlorodiphenyltrichloroethane (DDT), and PCB levels in fish tissue (NMDOH *et al*. 2009). All waterbodies listed in the advisory are listed as impaired except waterbodies were available mercury in tissue data are below the New Mexico water quality criterion of 0.3 mg/kg. For additional information, see Section C.6 of this document. The dissolved oxygen listing may be related to excessive nutrients. SWQB is in the process of developing nutrient assessment protocols for lakes and reservoirs.

Sources of Surface Water Impairment for Lakes and Reservoirs

New Mexico's impairment source summary for lake/reservoir assessment units are presented in Figure 13. The probable source list included with any cause of impairment is intended to include any and all activities that could be contributing to the identified impairment. It is not intended to single out any particular land owner or single land management activity, and has therefore been labeled "Probable" and generally includes several possible items. Probable sources listed for any particular water body have not been proven to be the only source(s) of the identified impairment. It is generally based on qualitative field observations combined with knowledge of known land management activities that have the potential to contribute to the identified

impairment. The approaches to documenting probable sources has been revised as described in the above section regarding sources in rivers and streams. The ADB-generated report that was used to generate the below figure is included in Appendix B. Standard EPA cause categories included in ADB were used to label the graphic. See the above-referenced appendix for subcategory information.

Sources of Impairment (Subcategory from ADB)	Acres Impaired
Atmospheric Deposition - Toxics	44,493.12
Rangeland Grazing	5,656.5
Loss of Riparian Habitat	4,267.5
Streambank Modifications/destablization	4,251.19
Impervious Surface Runoff	3,840.06
Natural Sources	6,197.5
On-site Treatment Systems (Septic Systems and Similar Decencentralized Systems)	1,357.62
Wildlife Other than Waterfowl	1,333.81
Subsurface (Hardrock) Minining	1,333.81
Contaminated Sediments	6,809.60

NOTE: See Appendix B for complete list of categories and subcategories generated from ADB.

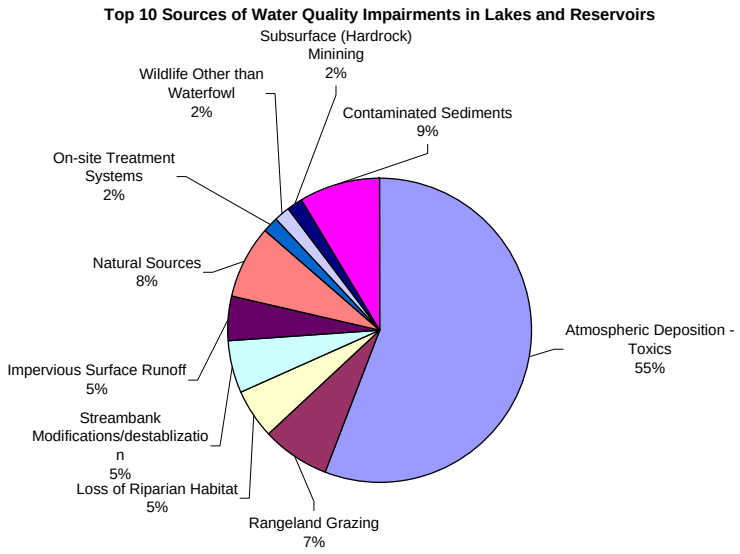


Figure 13. Sources of Surface Water Impairment for Lakes and Reservoirs

Atmospheric deposition, contaminated sediments, natural sources, and rangeland grazing are the leading probable sources of impairment in New Mexico's lakes and reservoirs. The acres impaired due to the atmospheric deposition of toxics is the largest documented probable source because this probable source is included with all "Mercury in Fish Tissue" and "PCBs in Fish Tissue" listings around the state.

Natural sources could include contributions from the surrounding geology, wildlife grazing, impacts from waterfowl, temporary or prolonged drought, etc. These occurrences are believed to contribute to localized water quality problems in certain areas of the state. There is some potential redundancy between probable source categories Natural Sources and Wildlife Other that Waterfowl.

On-site treatment systems (such as septic tanks) are noted as a source of impairment. These primarily domestic systems can lead to water quality problems if they are improperly installed or poorly maintained.

Consistent with other western states, point source discharges play a quantitatively minor role in the impairment of the state's lakes and reservoirs. The vast majority of all water quality impairment identified in New Mexico's lakes and reservoirs is due to nonpoint sources of water pollution.

Trophic Status in New Mexico Lakes and Reservoirs

Trophic status is determined as part of lake water quality monitoring efforts. Although trophic status alone is not used in New Mexico for use attainment determination, it is an important tool which helps relate the relative condition of a lake to its designated use support, and also leads to a better understanding of what probable cause or causes may be contributing to water quality problems within a lake. Trophic status was determined for a variety of lakes and reservoirs using the Carlson trophic state indices (TSIs). The lakes were categorized using a continuum from oligotrophic to eutrophic. The univariate Carlson index used to determine trophic state is based on Secchi disk depth, *chlorophyll a*, and total phosphorus concentrations.

Each of the Carlson TSI values for a given lake has been separately evaluated with preferential consideration given to chlorophyll concentrations. Trophic state boundaries are consistent with the EPA index. For example, trophic state values exceeding 47 indicate a eutrophic lake and values less than 42 indicate oligotrophic lakes (USEPA 1974, 1979).

Classification systems simplify the dynamic concept of trophic state. Among the assumptions of the classification indices are that algae are the most important primary producers and nutrient loading is responsible for the productivity within the lake (USEPA 1974, 1979). The Carlson index is of limited applicability for lakes with significant non-algal turbidity or nitrogen limitation, where aquatic macrophytes are the dominant primary producers, or where zooplankton grazing controls algal abundance. The biological data and total nitrogen/total phosphorus ratios for each lake are also used to help evaluate the utility of the trophic index for classifying lakes in New Mexico. Table 12 displays the number of evaluated lentic waters within each trophic class based on data collected and assessed through 2009.

Table 12. Trophic Status of New Mexico Lentic Waters

Trophic Class	Description	Number of Evaluated Lentic Waters
Oligotrophic	Clear water; low levels of nutrients and high levels of oxygen	4
OligoMesotrophic	Hypolimnia (lower, colder layer of lake) of shallower lakes may become anoxic	21
Mesotrophic	Water moderately clear; increasing probability of hypolimnetic anoxia during summer	27
MesoEutrophic	Capable of producing and supporting moderate levels of plant and animal life	12
Eutrophic	Anoxic hypolimnia, macrophyte problems possible	49
HyperEutrophic	Light-limited productivity; dense algae and macrophytes	3
Dystrophic	Acidic brown water, lacking in oxygen, and unable to support much plant or animal life	1

Lake Acidification

No lakes in New Mexico are known to consistently have pH values less than 5.0 standard units; therefore, there is no current need to develop methods to neutralize or restore buffering capacity. Lakes most likely to be susceptible to acidic precipitation are characterized by alkalinities less than 5-10 mg $CaCO_3$/L, have small watersheds, and are located on granitic bedrock at high elevations. Data from fourteen such lakes indicated that, based on the characteristics listed above and of the lakes reviewed, the Truchas Lakes and Santa Fe Lake are potentially the most susceptible to acidification due to low buffering capacity (Lynch *et al*., 1988). Further data for these and other alpine lakes are needed to establish acidification trends in any high-elevation lake in New Mexico. The high elevation cirque lakes in New Mexico are all contained within National Forest boundaries. The United States Forest Service (USFS) has developed a monitoring plan to perform tracer studies to identify the sources of possible acid precipitation falling in the state's major high-mountain areas.

Blue-Green Algae

In 2009, there were reported cases of illness consistent with toxins produced by blue-green algae from primary contact activities in both Bill Evans Lake and Elephant Butte. Blue-green algae, or cyanobacteria, are aquatic, photosynthetic, microscopic organisms that are naturally-occurring in lakes and streams. Algae forms when conditions include the presence of warm, shallow, stagnant water that receives a lot of sunlight. Toxic algae blooms are usually localized, sporadic and last a very short amount of time, primarily in the summer.

Though not naturally a toxin, algae can produce toxins which can make animals (except for fish) sick when consumed. Algae toxins have been shown to attack the nervous system of animals which can lead to death if not immediately treated. When swimming near algae blooms, people can develop skin rashes and might experience symptoms similar to that of food poisoning.

NMED documented the presence of specific species of naturally-occurring blue-green algae in these lake that can cause toxic effects. The toxins themselves were not identified through this qualitative review. The presence of blue-green algae and along with the reported illnesses prompted the New Mexico State Parks and New Mexico Department of Game and Fish to post swimming advisories for Elephant Butte and Bill Evans Lake, respectively.

SWQB recognizes concerns regarding the presence of blue-green algae toxins as a potential impairment to the swimmable goals of the CWA. SWQB does not presently have assessment protocols regarding the conversion of swimming advisories due to toxic algae into CWA 303(d) impairment listings. The presence of blue-green algae in these two lakes has been noted in the AU Comments for these waterbodies, and SWQB staff are investigating how to best incorporate the presence of swimming advisories such as these into future integrated lists and reports.

Control Methods

Programs and measures to control potential pollution sources to New Mexico's lakes include the NPDES for point source discharges, the federal dredge-or-fill permits (CWA §404), discharge plans required under the state ground water regulations, state review of federal actions under the consistency provisions of CWA §401, and agreements between NMED and other state and federal agencies to implement NPS pollution control measures.

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

Assessment units noted as Category 5A, 5B, or 5C on the Integrated List comprise New Mexico's CWA §303(d) list of impaired waters. A Table of Contents listing of Category 5 only waters was generated from ADB and is included in Appendix A. To see details on a particular impaired assessment unit, refer to the particular assessment unit entry on the full Integrated List (Appendix A). The causes and sources of these impairments are summarizes by waterbody type (rivers/streams vs. lakes/reservoirs) in the above sections. An associated Record of Decision (ROD) document is maintained by SWQB as well. The ROD is a historical record of impaired surface waters (i.e., Category 5 waters) provided to reviewers and users of the list and EPA to help track listing and de-listing information used in the development of New Mexico's Integrated CWA §303(d)/§305(b) list. EPA does not require this document and does not officially approve or disapprove its contents.

New Mexico's Integrated List also includes a projected "TMDL Schedule" for all assessment unit – parameter impairment pairs. These dates indicate the state's priority ranking and which TMDLs are targeted for development in the upcoming years. These proposed dates are primarily based on the SWQB's current rotational monitoring schedule, consent decree deadlines, date since last intensively surveyed, and upcoming NPDES permit renewals. If listed as Category 5A, this is the proposed year of TMDL completion. If listed as Category 5B or 5C, new data should be collected by this date. At that point, either a TMDL should be developed, or the category changed accordingly. These dates on the Integrated List, as well as the "Monitoring Schedule" date, are dependent upon personnel and financial resources which change on an annual basis.

CWA §303d List of Impaired Water Record of Decision is available at:
http://www.nmenv.state.nm.us/SWQB/303d-305b/2008-2010/index.html

C.5 New Mexico's Wetlands Program

The United States Department of Agriculture Natural Resource Conservation Service has identified approximately 740,600 acres of existing wetlands in New Mexico (USDA/NRCS 2000), which represents only a portion of the wetlands determined to be in existence in the early 1800's. Historically, the value of wetland habitats was not fully appreciated, so wetlands were utilized for what were considered more productive uses: agriculture, flood control structures, stockyards and livestock production, residential and industrial development, and oil and gas production. As a result, New Mexico has lost a significant portion of these types of habitats.

Among the threats to New Mexico's wetlands are development, ground water pumping lowering shallow water tables, the use of wetlands for storm water control, gravel mining, invasive exotic plant and animals, channelization, and agriculture. As an example, channelization 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 along the river corridors which in turn supported healthy wetlands ecosystems. Instead, river banks and floodplains are starved of overbank flooding events, natural river shifting and meandering processes are interrupted, materials transport and deposition processed are accelerated, and vegetation communities are altered. The results include the loss of riverine wetland functions such and natural flood attenuation, nutrient cycling, habitat connectivity, particulate retention, dynamic and long-term surface water storage, moderation of ground water flow or discharge, and maintenance of vertebrate and invertebrate communities and habitat structure. Channelization can also result in severe bank erosion and gully formation causing sediment build up in rivers and reservoirs and the loss of habitat for native fisheries, waterfowl and wildlife.

Another area of concern relating to the degradation of wetland areas, primarily playas, is contamination from the disposal of brine and associated residues of oil and gas production. 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 important Central Flyway. In particular, 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), and for 15 priority species of shorebirds listed in the US Shorebird Conservation Plan for the Central Plains/Playa Lakes (Brown et. al 2001). These playas are also used by other wildlife such as pronghorn antelope, for irrigation and livestock watering, and provide recreational opportunities such as hunting and bird-watching.

The Wetlands Program administers wetland restoration and program development grants received from the US Environmental Protection Agency under the CWA §104(b)(3). The overall goals of the Wetlands Program are to protect and restore New Mexico's remaining wetlands and riparian areas and to increase self-sustaining and naturally functioning wetlands and riparian areas. The Wetlands Program emphasizes the role of wetlands in prevention and reduction of water quality impairments and providing habitat and life requirements for wildlife. The objectives of the Program include the following:

- conduct baseline monitoring and identification of wetlands and to implement wetlands restoration projects;
- inventory wetlands resources by conducting landscape level mapping and classification, and working through a statewide mapping consortium;
- promote maintenance of instream flow to support streamside and floodplain wetlands as well as provide other water quality benefits;
- promote agricultural water use management and measurement and to support wetlands as filtration systems for agricultural runoff;
- promote land management techniques to restore wetland-supporting beaver habitat;
- increase wetland acreage in New Mexico by the restoration and protection of wetland corridors;

- develop and implement hydrogeomorphic classification and assessment of wetlands throughout the state of New Mexico with assistance from the New Mexico Wetlands Workgroup;
- ensure adequate protection of closed basin and isolated wetlands at the State level;
- participate in and administer wetland restoration projects; and
- participate in wetland/riparian education and outreach for schools and interest groups.

The monitoring goals of the Wetlands Program include developing and using monitoring protocols and criteria to verify wetland degradation, impacts and recovery; documenting wetland gains and losses; documenting results of wetlands creation, restoration and enhancement projects; and developing an inventory of wetlands resources and prioritization of wetlands projects and protection within specific watersheds. The results of New Mexico's Wetlands Program monitoring efforts will help expand and refine the state WQS to include narrative and numeric criteria and designated uses that are specific to wetlands. These measures will be used to ensure that the biological, chemical and physical integrity of all New Mexico wetlands are adequately protected.

Developing a wetlands inventory, collecting baseline monitoring information, identifying permanent monitoring sites and assessing the status and function of wetlands are parts of an integrated monitoring framework performed on the watershed scale as part of the "Wetlands Action Plan" Program. These monitoring tasks provide information needed for establishing strategies, policies and management interventions to maintain wetland ecosystem character and ecosystem functions. An inventory of wetlands can be used to collect information to describe the ecological character of wetlands; monitoring of wetlands provides information on the extent of any change; and assessment considers the pressures and associated risks of adverse change in ecological character. All three are important and interactive data gathering exercises and are considered as linked elements of an overall integrated framework which, when implemented, provides for identification of key features of the character of wetlands within a watershed. Taken together, they provide the information needed for establishing strategies, policies and management interventions to maintain the defined wetland ecosystem character and hence ecosystem services.

Wetlands activities currently being implemented as part of the Wetlands Program include the implementation of the Wetlands Action Plan Program in which Wetlands Action Plans are developed for and by watershed groups. The Wetlands Program is in the process of developing a ten-year monitoring strategy for wetlands and collecting rapid assessment data for select classes of wetlands. The Wetlands Program also will begin in 2010 to map and classify wetlands in the Canadian River drainage, including playas and isolated wetlands, in northeastern New Mexico as part of our landscape Level 1 assessment strategy. A number of restoration projects are occurring statewide and are funded by the EPA Region 6 CWA Section 104(b)(3) Program Development grants. Projects that are currently underway are listed below. Project activities include restoration of wet meadows and waterfowl habitat on the Rio Grande along the central flyway, restoration of bosque 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 wetlands resources including buffer zones, restoring beaver habitat, restoring high mountain fen wetlands, river restoration to address transportation maintenance issues, and conservation of playas and closed basin wetlands. These projects implemented with assistance through NMED SWQB are located statewide as noted in Table 13 and Figure 14. The Wetlands Program maintains the New Mexico Statewide Wetlands Roundtable consisting of State and

Federal agency and tribal participation, and will begin a Statewide Wetlands Roundtable for non-governmental organizations (NGOs) in 2010.

Table 13. Active Wetlands Projects in New Mexico by County

Project	County
Mesilla Valley	Dona Ana
Cedro Creek	Bernalillo
El Restauro	Rio Arriba
Galisteo Wetlands	Santa Fe
Rio de las Vacas	Sandoval
Valles Caldera	Sandoval
DOT Implementation	Catron
Santa Fe County	Santa Fe
Wetlands Action Plan Phase 1	Statewide
Wetlands Action Plan Phase 2	Grant, San Juan, Curry, Lea, Sandoval
Monitoring & Assessment Phase 1 and 2	Statewide,Taos and Rio Arriba
Hyperspectral Imagery	Taos, Rio Arriba
Vegetation Indicators	Taos, Rio Arriba
Playas of Curry County	Curry
La Cienega de San Vicente	Grant
Cebolla Canyon	Cibola
Eastern NM Map and Class	Mora, Colfax, San Miguel, Harding

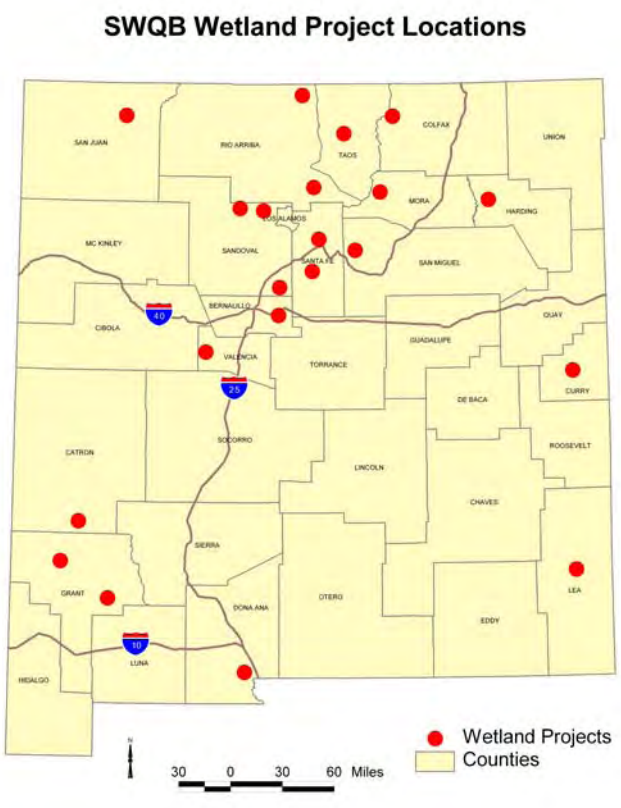


Figure 14. Location of Active Wetland Projects in New Mexico

C.6 Public Health Issues

The relationship between water quality and human health is greatly influenced by environmental conditions. New Mexico faces many water quality challenges related to public health issues, including: (1) pathogens resistant to standard water treatment methods, (2) chemical and biological contaminants, (3) aging or inadequate water system infrastructure, and (4) emergency- or disaster-related events. To address these challenges New Mexico implements a comprehensive Drinking Water Program, monitors and assesses waterbodies for compliance with human health criteria through the Water Quality Management Program, and is expanding and refining the Fish Consumption Advisory Program (through coordination with NMED, the New Mexico Department of Game (NMDGF) and Fish, and the New Mexico Department of Health (NMDOH).

Excess nitrates and biological contamination are the primary contaminants in drinking water supplies that can cause adverse health effects. Excess nitrates above the Maximum Contaminant Level (MCL) can cause methemoglobinemia (also known as “blue baby syndrome) which occurs when the ingested nitrate interferes with the ability for blood to carry oxygen to body tissues. An analysis of the NMED DWB’s database indicated that for 2001 - 2008, 14 (42%) of the 33 counties in New Mexico had one or more public water systems that violated the MCL for nitrate (Espinoza/NMDOH, 2006; NEPHTN, 2009). There were no reported cases of methemoglobinemia in 2002 through 2008. Note that as of June 30, 2006, infant methemoglobinemia and other suspected environmentally-induced health conditions were added to the notifiable conditions list. This step will help enhance surveillance efforts.

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

The NMDOH monitors reported diseases and organisms that are potentially water related in an effort to help ensure the safety of New Mexico's public drinking water. These diseases and organisms include: Camplyobacteriosis, Cryptosporidiosis, *E.coli*, Giardiasis, Hepatitis A, Salmonellosis, and Shigellosis. These diseases and organisms can also be transmitted through food or person-to-person contact. There were over 1,000 reports of infectious diseases that could be carried via water in 2006-2007 in New Mexico (Hagan, 2009). However, none of these cases were confirmed as being associated with a contaminated drinking water source, despite drinking water advisories being administered in the same geographical area, during the same time period as illness occurred. When a Boil Water Advisory is issued, the NMDOH provides educational materials for the public and advises district public health officials to be on alert for cases of gastrointestinal illness. New Mexico remains vigilant for any potential incidents, paying

particular attention to water systems with a history of problems meeting federal drinking water quality standards.

For more information water related public health concerns, refer to the NMDOH's water quality webpage at http://www.health.state.nm.us/eheb/waterQ.shtml.

Drinking Water Program

NMED administers the Drinking Water Program which ensures that the requirements of the SDWA are implemented appropriately.

The SDWA, which is administered by the Drinking Water Bureau in the Water and Wastewater Infrastructure Development Division of NMED, establishes the standards for drinking water throughout the state. These standards set limits for harmful contaminants, including pesticides, volatile organics, radiochemical, chemical and bacteriological contaminants, all of which are tested for in the region's ground and surface water.

Testing for surface water sources is assigned an alternate sampling frequency, to reflect the different characteristics of a surface water source when compared to a groundwater source, i.e., there is more frequent sampling of surface water sources due to the potential for rapid change in water quality.

New Mexico RIVERS/ STREAMS used for Drinking Water:

- San Juan (3),
- Animas (3),
- Rio Grande
- Rio Puerco,
- La Jara Creek,
- Rio Tesuque,
- Fresnal Creek,
- Rio Ruidoso,
- Eagle Creek,
- Rio Chama,
- Cimarron River (2),
- El Rito Creek,
- Navajo River,
- Rio de Vallecitos,
- Los Pinos River

Assessments of surface water sources' vulnerability to contamination have been completed for all public water systems utilizing surface water sources. The New Mexico Source Water Assessment and Protection Program evaluates surface water sources on the following criteria: Stream Flow Rate or Reservoir Size; Surface Water Intake Construction and Integrity; Intake Method (Direct or Indirect); and Average Daily Turbidity of the surface water source. Sources of contamination were also identified within the ten mile segment upstream of each intake, to a distance of one half mile on either side of the source. The identified sources of contamination were evaluated based on: The Chemical Properties of the Associated Contaminants; the Likelihood of Release; the Number and Proximity to the surface water source; and the Chemical Monitoring History.

New Mexico LAKES/RESERVOIRS used for Drinking Water:

- Navajo Lake,
- Conchas Lake,
- Bonito Lake,
- Nichols & McClure Reservoir (City of Santa Fe),
- El Vado Lake,
- Lake Maloya,
- Eagle Nest Lake,
- Storrie Lake,
- Cimarroncita Reservoir,
- Miami Lake,
- Uracca and Phillips Reservoirs (Philmont Scout Ranch)

The following issues illustrate some of New Mexico's challenges of supplying safe and sufficient water to its residents:

- EPA revised the radionuclides rule, effective December 8, 2003. The revised rule regulates uranium for the first time. The MCL is 30 ppb for uranium in public water systems. Initial monitoring to determine compliance with the new MCL for uranium must be conducted by December 31, 2007. Historical data indicate this new rule will affect approximately 70 public water systems in New Mexico. In addition, EPA lowered the Arsenic MCL from 50 parts per billion (ppb) to 10 ppb. The new 10 ppb MCL went into effect January 23, 2006. The lower MCL affects 77 public water systems in New Mexico. Currently, most options available to reduce arsenic and uranium levels are likely to require significant capital funding and may increase operation and maintenance costs for the affected systems. This will place tremendous burdens on local budgets. Installation of treatment systems may also increase the need for higher training levels for certified operators and may generate a waste stream that requires permitting.

- Since 1996, New Mexico has experienced extended periods of drought, which has affected some public drinking water systems and supplies. If drought conditions continue, impacts will be more widespread. Drought- related impacts to public water systems include partial or total loss of water source; increased levels of naturally occurring regulated contaminants due to increased depth-to-water in wells; increased turbidity in surface water systems; and the inability to add users to a public water system due to precarious or declining water quantity availability.

- Many systems in need of technical improvements have been unwilling to take on a loan, despite the favorable terms offered by several government funding sources. This is due, in part, to the availability of state and federal grants and other “free money. However, these “free money” sources have rarely been sufficient to cover the total cost of a community’s water system project needs. Some systems, therefore, are in a perpetual state of technical inadequacy.

REDUCED COSTS OF DRINKING WATER – AN INCENTIVE FOR CLEAN WATER

EPA promulgated the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) in January of 2006, and the State of New Mexico adopted this rule in July of 2006. The LT2ESWTR applies to all public water systems (systems) that use surface water or ground water under the direct influence of surface water. For New Mexico, this encompasses a population of 722, 940, after the City of Albuquerque converted to surface water (via the Rio Grande) use in 2009. The Buckman Direct Diversion Project (BDD) will divert water from the Rio Grande and deliver it to Las Campanas and residents and businesses of the City of Santa Fe and Santa Fe County tentatively scheduled to begin in May 2011. Completion of the river diversion is scheduled for May 2010. Use of surface water sources will replace unsustainable pumping of groundwater sources.

Systems initially monitor their water sources to determine treatment requirements. For systems that serve at least 10,000 people, this monitoring involves two years of monthly sampling for Cryptosporidium. To reduce monitoring costs, small filtered water systems will first monitor for E. coli – a bacterium that is less expensive to analyze than Cryptosporidium – and will monitor for Cryptosporidium only if their E. coli results exceed specified concentration levels.

Treatment: Filtered water systems will be classified in one of four treatment categories (bins) based on their monitoring results. Most systems are expected to be classified in the lowest bin and will face no additional requirements. Systems classified in higher bins must provide additional water treatment to further reduce Cryptosporidium levels by 90 to 99.7 percent (1.0 to 2.5-log), depending on the bin. Systems will select from different treatment and management options in a “microbial toolbox” to meet their additional treatment requirements.

The LT2ESWTR will result in increased costs to public water systems and States. The average annualized present value costs of the LT2ESWTR are estimated to range from $92 to $133 million (using a three percent discount rate). Public water systems will bear approximately 99 percent of this total cost, with States incurring the remaining 1 percent. The average annual household cost is estimated to be $1.67 to $2.59 per year. At a population of 722, 940, cleaner surface source water could be reflected in a savings of up to $1,872,414 per year.

Table 14. New Mexico's Strategies to meet SDWA Requirements

Issue	Strategy
Monitoring Compliance with Drinking Water Standards	New Mexico works with communities, state officials and other entities to refine, develop and implement adequate sampling and testing procedures to determine if public water supplies meet federal/state drinking water standards. In addition, New Mexico has programs in place to ensure that community systems are well designed, and that water sources and storage and distribution facilities are safe from contamination and operated appropriately. Currently, 82% of community water systems in New Mexico are operated by a certified operator.
Developing Compliance Strategies	New Mexico is collaborating with water systems to develop compliance strategies for the new arsenic and uranium standards. Plans may include blending of existing water sources, obtaining a new water source, and/or installing treatment technologies to lower the contaminant level.
Regionalizing Public Water Systems	NMED is participating in a multi-agency effort to support the appropriate regionalization of public water systems due to the tremendous infrastructure needs and chronic management problems with small systems. There have been 27 groups of water systems identified throughout New Mexico that have the potential to regionalize.
Financial Assistance	NMED encourages systems to take advantage of the Uniform Funding Application (UFA) process. The UFA provides a single location for systems to apply for funding from programs such as the SDWA State Revolving Loan Fund, the Rural Infrastructure Program, the United States Department of Agriculture (USDA) Rural Development Program to fund water supply projects. The financing programs included in the UFA provide grants and loans to communities to construct and rehabilitate water systems.
Technical and Administrative Assistance	NMED Drinking Water Bureau currently provides technical, managerial and financial assistance to water systems within the state using . In addition to DWB several technical assistance providers have contract with EPA, USDA and other federal agencies to provide assistance to water systems.
Water Conservation Fee	New Mexico implements a water conservation fee to provide funding for testing required by the SDWA. The fee requires water systems to pay $0.03 per one thousand gallons of potable water produced. Implemented in 1993, the water conservation fee program not only provides conservation measures, but also allows for the issuance of waivers from monitoring to public water systems when water sources are identified as not being vulnerable to contamination. As a result of this effort, the statewide capacity for conducting water analyses has expanded with contracts issued to laboratories outside of the state laboratory system.
Addressing Loss-to Leakage Problems	New Mexico is developing a more effective statewide water conservation program to address loss-to-leakage problems experienced by many small systems. It is not unusual to see a loss-to-leakage rate of between 20-40% in some systems.
Compliance/Enforcement Tools	NMED typically issues Administrative Orders to systems that do not comply with applicable regulations. These actions usually result in system compliance. If this action is not successful, formal enforcement with penalties for non-compliance is initiated.
Source Water Protection Plans	New Mexico encourages systems to develop and implement a Source Water Protection Plan (SWPP). To date, 93 SWPPs have been developed. Any significant proactive action (previous or new) taken by the water system is recognized as substantial implementation of a SWPP

As drinking water standards become increasingly difficult to achieve and standards for naturally occurring contaminants in ground water become more stringent, ground water that can meet regulatory requirements with little treatment becomes less available. Although relatively little surface water is used in New Mexico for drinking water purposes, diminishing ground water resources and increasing demand dictate that surface water will be relied upon more heavily in the future. For example, the City of Albuquerque has constructed a new surface water plant on the Rio Grande designed to utilize their San Juan-Chama surface water rights to supplement existing groundwater sources. The City of Santa Fe is also currently in the process of developing the infrastructure needed to use surface water from the Rio Grande for drinking water purposes (see http://www.bddproject.org/index.htm for additional information). Additionally, a new surface water treatment plant in Doña Ana County is in the planning stages to supply water to the Las Cruces area.

Some of the strategies to address these issues and meet the requirements of the SDWA, are described in Table 14.

Water Quality Standards Program – Human Health Criteria

Human health criteria are implemented through the Water Quality Standards Program described in Section B.2. Human health criteria are numeric values developed to protect the health of humans who consume aquatic life such as fish or shellfish. Under CWA §304(a), water quality criteria are based solely on data and scientific judgments about the relationship between pollutant concentrations and environmental and human health effects; they do not consider economic or social impacts.

Fish Consumption Advisory Program

Fish as a lean, low-calorie source of protein,are 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. The NMDOH, NMDGF, New Mexico State Parks, and NMED work together to implement New Mexico's Fish Consumption Advisory Program.

Recently, data derived from EPA's National Fish Tissue Study and the Cooperative PCB Study Group (consisting of NMED, Los Alamos County, United States Department of Energy, and Los Alamos National Laboratory) have raised concerns about fish tissue contamination in New Mexico. These data suggest that contaminants such as PCBs and DDT, an organochlorine pesticide, and its derivatives, as well as mercury, may be present in concentrations that could pose an unacceptable health risk for people who eat fish from some New Mexico waters. Partly as a result of these studies, New Mexico is revitalizing and expanding the Fish Consumption Advisory Program.

New Mexico's Fish Consumption Advisory Program's monitoring strategy involves screening a select number of sites for chemical contamination where sport, subsistence, or commercial fishing is conducted. Site selection will be 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 will help 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.

Currently, statewide advisories have been issued for mercury, DDT, and PCBs in fish tissue at several reservoirs, lakes, and rivers (NMDOH, et al., 2009). In 2006, as a result of the fish tissue contaminant data analysis from Brantley Reservoir, the New Mexico Game Commission restricted fishing in Brantley Reservoir and the Brantley Wildlife Management Area to "catch and release" only.

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

PART D - GROUND WATER MONITORING AND ASSESSMENT

D.1 Introduction to Ground Water in New Mexico

New Mexico's ground water resources are of vital importance in sustaining life, and must be preserved for both present and futures generations. Approximately 90% of the total population of the state depends on ground water for drinking water. Eighty-one percent (81%) of the population is served by public systems with water derived from ground water sources. Over 170,000 people depend on private wells for drinking water. Nearly half of the total water annually withdrawn for all uses in New Mexico, including agriculture and industry, is ground water, the only practicable source of water in many areas of the state. About 4.4 billion acre-feet of recoverable fresh and slightly saline water are estimated to be present in underground aquifers in New Mexico. Overall, the quality of these waters is assumed to be good, although there are significant pollution problems known to affect certain areas throughout the state.

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

The magnitude of ground water supplies in the state is estimated to be 20 billion acre-feet. Of this amount, an estimated three billion acre-feet of fresh water and 1.4 billion acre-feet of slightly saline water are recoverable. In some areas with significant ground water use, ground water levels have declined due to withdrawals in excess of recharge (Bureau of Reclamation 1976).

D.2 Overview of Ground Water Monitoring and Protection Programs

New Mexico relies on several programs, established under a variety of different legislative acts, to protect and maintain ground water quality. The major state statute dealing with water quality management is the WQA which specifically includes ground water within its scope. This Act created the WQCC and authorized it to adopt ground-water quality protection regulations and standards. Key features of the Act and regulations relating to ground water include:

- a requirement for dischargers to obtain a Ground Water Discharge Permit to prevent ground water contamination from discharges that have the potential to impact ground water quality;
- requirements for reporting and addressing spills and releases;

- development of ground water quality standards for ground water contaminants (20.6.2.3103 NMAC);
- development of ground water pollution assessment and abatement regulations and underground injection control requirements; and
- provisions for civil and criminal penalties for violation of the regulations and standards.

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

Ground water quality monitoring is typically required at permitted facilities and as part of remediation efforts. The state also offers free well water quality screening at water fairs routinely held around the state.

D.3 Summary of the Status of Ground Water Quality

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

Approximately 255 facilities with ground water discharge permits have confirmed ground water contamination based on the last quarter of FY2009. These facilities are being required to take corrective actions pursuant to permit conditions or abatement plans. Over 200 additional sites with potential or confirmed ground water contamination are being addressed under spill response regulations, the voluntary remediation program or abatement regulations.

D.4 Ground Water Contamination Sources

More than half of ground water contamination cases in the state have been caused by nonpoint sources, predominantly household septic tanks or cesspools. Nonpoint source contamination may be caused by diffuse sources such as large numbers of small septic tanks spread over a subdivision, residual minerals from evapotranspiration, animal feedlot operations, areas disturbed by mineral exploration and/or storage of waste products, urban runoff, or application of agricultural chemicals. Point source categories include publicly and privately owned sewage treatment plants with flows over 2,000 gallons per day, dairy lagoons, mines, food processing operations, industrial discharges, landfills, and accidental spills or leaks.

Synthetically-lined dairy wastewater lagoon

D.5 New Developments in Ground Water Protection and Implementation

Updated Liquid Waste Regulations

State regulations applicable to the treatment and disposal of small volumes of domestic wastewater (2000 gallons per day or less) were significantly revised, effective July 2005. Additional minor amendments took effect April 2007. The revisions include several provisions that may benefit ground water quality including an increased minimum lot size for new or previously un-permitted conventional septic systems, a mandatory inspection at the time of property transfer and a certification program for installers and advanced treatment system operators

D.6 Ground Water Issues Warranting Further Development

Dairy Discharge Permit Regulations

The New Mexico Water Quality Act was amended during the 2009 regular legislative session. The 2009 amendments require the adoption of industry specific dairy wastewater discharge regulations by the WQCC. NMED as the constituent agency to the WQCC that is responsible for implementing regulations promulgated by the WQCC has begun development of these regulations pursuant to a schedule adopted by the WQCC. In 2009, NMED released two discussion drafts of proposed dairy discharge regulations, held numerous public meetings, created an advisory committee and conducted advisory group meetings, and held negotiations with interested stakeholders. A petition for rule change and proposed dairy discharge regulations were filed with the WQCC in December 2009. A hearing on the proposed regulations will be held by the WQCC April 2010.

Regulation of Septage Haulers

NMED has recognized the need to better regulate septage hauling and disposal in New Mexico to protect water resources and public health. Illegal disposal of septage is a known occurrence throughout the state. While the lack of a sufficient number of proper disposal facilities is a factor, illegal disposal activity has been observed in areas with adequate facilities for disposal, and may be motivated by economics, long-standing common practices, and lack of awareness of the potential threat to human health and the environment. NMED resolved two enforcement actions for incidents of illegal septage disposal and is pursuing a third. In 2008, the New Mexico state legislature provided funding to the NMED for a staff person to develop and implement regulations to govern the activities of septage haulers. NMED is evaluating a timeframe for the development of these regulations under the Water Quality Act. Such regulations could provide an effective means of reducing illegal septage disposal and resultant threats to ground water, surface water, public health and the environment.

Regulation of Discharges from Los Alamos National Laboratory (LANL)

The NMED issued draft ground water discharge permits for waste discharges at two facilities at LANL in April 2005. In an effort to address some concerns of interested parties, revised drafts are anticipated in 2010. Hearings are expected on one or both permits. A permit application for discharges of domestic waste to multiple septic tank/leachfield systems on LANL property is also undergoing review. There are a number of other LANL discharges to ephemeral drainages from numerous outfalls that have the potential to adversely affect ground water quality. WQCC regulations require ground water discharge permits for LANL outfalls that presently lack permits. The development of ground water discharge permits for LANL discharges will be highly labor-intensive because the activities producing the discharges and the management of the generated wastewaters are technically complex and require great scrutiny by program staff. Intensive collaboration with other NMED programs (Hazardous Waste Bureau, DOE Oversight Bureau, SWQB) is necessary to ensure that appropriate permitting decisions are made upon consideration of all relevant information maintained by NMED staff. LANL activities also attract abundant public attention, thus permitting staff need to spend considerable time interacting with interested parties.

Ground Water Program Evaluation

Prevention of ground water contamination is clearly more cost effective and technically achievable than remediation. Consequently, New Mexico continually works to improve the effectiveness of the ground water discharge permit program. Improved permit conditions have been developed to address issues identified as needing additional attention, such as contingency and closure plans, relining dairy lagoons, septic system maintenance, the use of reclaimed wastewater and financial assurance. The program has created new permit templates for particular types of facilities, such as car washes and grease trap waste disposers.

The state continues to work cooperatively as much as possible with industry groups. Many facilities now view the permitting process as a routine part of their business startup and day-to-day operations. Furthermore, many lending institutions are working closely with the state to ensure that the facilities have obtained necessary permits before business loans are approved or renewed.

Ground water protection program effectiveness is documented through site-specific monitoring at permitted facilities and facilities that are abating ground water contamination. Although there

is no overall index to determine the rate at which ground waters are polluted or remediated, state programs that protect the quality of the state's ground water have been successful in ground water quality protection. Based upon ground water monitoring data maintained by NMED, approximately 75% of facilities with ground water discharge permits have not caused exceedences of state ground water quality standards.

Assessment of Grants Mining District

The NMED Ground Water Quality Bureau in conjunction with EPA have begun assessing the public health and environmental impacts resulting from extraction, processing, disposal and releases from legacy uranium mining and milling activities in the Grants Mining District which is located in northwestern New Mexico. To date the Superfund Oversight Section of the Bureau has performed screening assessments of 27 legacy uranium mine sites in the Poison Canyon area, sampled approximately 60 existing wells in the San Mateo Creek Basin, and reassessed potential impacts from 2 uranium mill sites that are currently under the Department of Energy (DOE) Long Term Stewardship Program. In addition NMED and EPA are developing a five-year plan in conjunction with other federal, state and tribal entities that are both regulators and land owners/managers of contaminated properties responsible for protecting human health, safety and the environment and preserving cultural and natural resources. The purpose of the plan is to identify ongoing work being performed to assess uranium mining impacts in the Grants Mining District in the northwestern New Mexico, identify future work that may be required, and serve to coordinate, guide and maximize available agency resources of the many federal, state and tribal government entities.

Based on the recent assessments of the two former mill sites, Anaconda Company Bluewater Mill and Ambrosia Lake Phillips Mill, DOE has agreed to perform additional site characterization to address concerns identified during the assessments. Similarly, the Bureau of Land Management (BLM) has agreed to review the findings of the screening assessments of mines on BLM managed lands. EPA has initiated assessments of structures, with an emphasis on residences, that may have been impacted by legacy mining and milling activities and that may that may pose a threat to human health and the environment. The NMED's Superfund Oversight Section of the Ground Water Quality Bureau is currently developing strategies to assess and cleanup, as necessary, sources of sediment, surface and ground water, and air contamination originating from prior operation of and waste abandoned on abandoned uranium mines.

This plan acknowledges that impacts from uranium mining and milling extend beyond the Grants Mineral Belt; and therefore the proposed actions that will be initiated may be extended to areas with similar activities pending available resources.

PART E – PUBLIC PARTICIPATION

Given that all individuals living and working in the State affect water quality, public awareness and involvement is crucial to the successful implementation of water quality programs. New Mexico 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 promote changes in behavior and actively improve public involvement to produce both better decisions and greater public acceptance and support for those decisions.

The public participation requirements of specific water quality programs are described in the *State of New Mexico Statewide Water Quality Management Plan*. Additional information on the public participation process pertaining to water quality management programs can be found in the *State of New Mexico Continuing Planning Process*. 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 stakeholder list of affected/interested parties; and
- Notifying stakeholders in a timely fashion prior to consideration of major decisions (generally at least 30-day notice).

The public participation associated with the development of the Integrated List portion of this report (Appendix A) were conducted in accordance with the specifications identified above and included properly notifying stakeholders of a 60-day public comment period on the draft 2010-2012 Integrated List. Public notice on the Integrated List is also a Clean Water Act requirement. Responses to public comments on the Integrated List are included in Appendix C.

The State of New Mexico Statewide Water Quality Management Plan and Continuing Planning Process are available at: http://www.nmenv.state.nm.us/SWQB/Planning/index.html

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