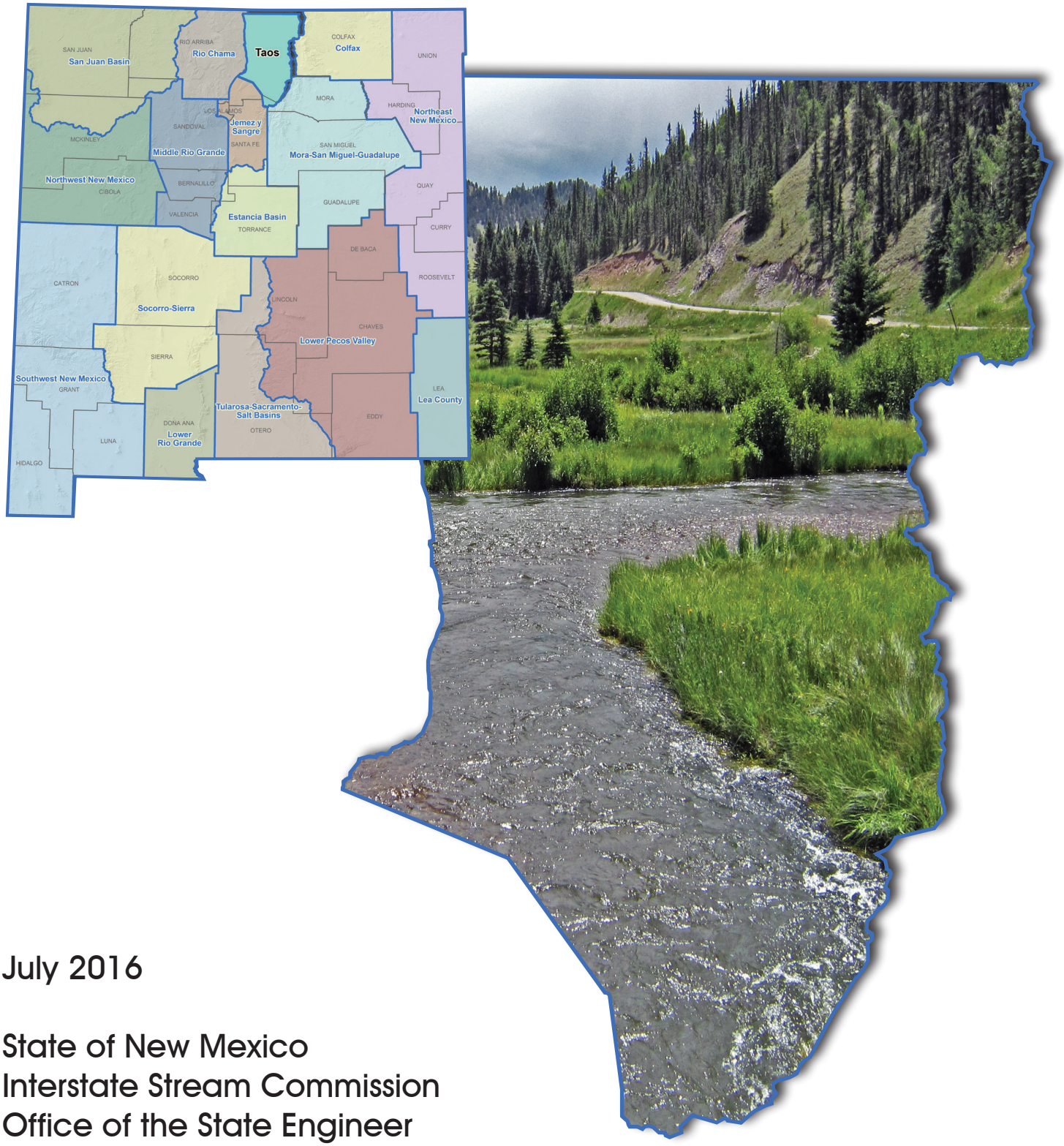
Taos Regional Water Plan



July 2016

State of New Mexico
Interstate Stream Commission
Office of the State Engineer

Cover photograph: Valle Vidal, 2010

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Note: Appendix designations indicate corresponding section in plan.

List of Acronyms

°F	degrees Fahrenheit
ac-ft/yr	acre-feet per year
AMO	Atlantic multidecadal oscillation
BBER	Bureau of Business and Economic Research
BLM	Bureau of Land Management
CDBG	Community Development Block Grant
CFRP	Collaborative Forest Restoration Program
CMI	Chevron Mining Inc.
CWPP	Community Wildfire Protection Plan
DBS&A	Daniel B. Stephens & Associates, Inc.
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FY	fiscal year
GIS	geographic information system
gpcd	gallons per capita per day
GWQB	Ground Water Quality Bureau [New Mexico Environment Department]
ICIP	Infrastructure Capital Improvement Plan
in/yr	inches per year
IPCC	Intergovernmental Panel on Climate Change
LQ	location quotient
MDWCA	mutual domestic water consumers association
MDWUA	mutual domestic water users association
NASS	National Agricultural Statistics Service
NCDC	National Climatic Data Center
NEPA	National Environmental Policy Act
NFL	nonfederal land
NGO	non-government organization
NMAC	New Mexico Administrative Code
NMBGMR	New Mexico Bureau of Geology & Mineral Resources
NMED	New Mexico Environment Department
NMG&F	New Mexico Department of Game and Fish
NMISC	New Mexico Interstate Stream Commission

NMOSE	New Mexico Office of the State Engineer
NMSA	New Mexico Statutes Annotated
NMSU	New Mexico State University
NMWQCC	New Mexico Water Quality Control Commission
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
PCB	polychlorinated biphenyl
PDO	Pacific decadal oscillation
PDSI	Palmer Drought Severity Index
POTW	publicly owned treatment works
PPP	project, program, and policy
PSTB	Petroleum Storage Tank Bureau (NMED)
RERI	River Ecosystem Restoration Initiative
RWP	regional water plan
SNOTEL	snowpack telemetry
SWCD	soil and water conservation district
SWPM	Southwest Planning & Marketing
TDS	total dissolved solids
TMDL	total maximum daily load
TVAA	Taos Valley Acequia Association
TVWC	Taos Valley Watershed Coalition
U.S. EPA	U.S. Environmental Protection Agency
UNM	University of New Mexico
USBR	U.S. Bureau of Reclamation
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
UST	underground storage tank
UWB	underground water basin
WRCC	Western Regional Climate Center
WSD	water and sanitation district
WUA	water users association
WWTP	wastewater treatment plant

Executive Summary

The Taos Water Planning Region, which includes Taos County and a portion of the Embudo watershed in southeastern Rio Arriba County (Figure ES-1), is one of 16 water planning regions in the State of New Mexico. Regional water planning was initiated in New Mexico in 1987, its primary purpose being to protect New Mexico water resources and to ensure that each region is prepared to meet future water demands. Between 1987 and 2008, each of the 16 planning regions, with funding and oversight from the New Mexico Interstate Stream Commission (NMISC), developed a plan to meet regional water needs over the ensuing 40 years. The Taos Regional Water Plan (RWP) was completed in April 2008 and accepted by NMISC that same year (DBS&A, 2008).

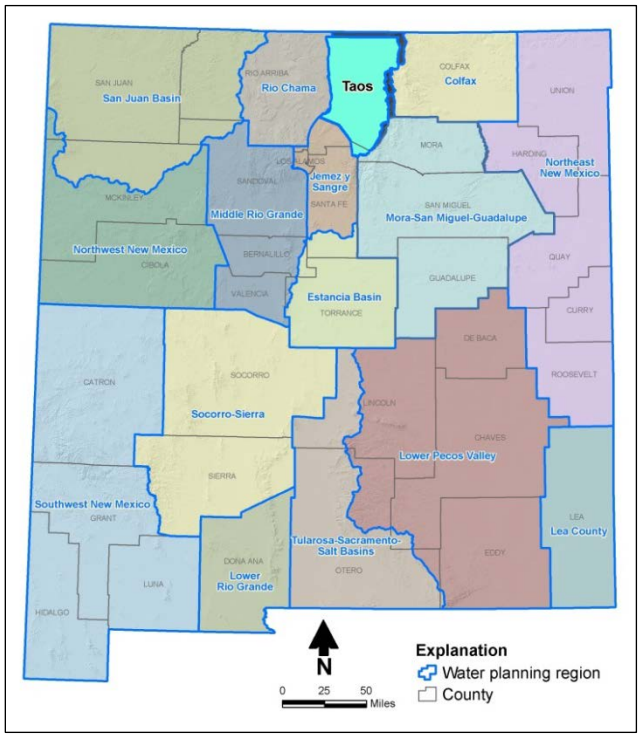


Figure ES-1. Taos Water Planning Region

The purpose of this document is to provide new and changed information related to water planning in the Taos region and to evaluate projections of future water supply and demand for the region using a common technical approach applied to all 16 planning regions statewide. Accordingly, this regional water plan update summarizes key information in the 2008 plan and provides updated information regarding changed conditions and additional data that have become available.

Based on the updated water demand (Figure ES-2) data, Figure ES-3 illustrates the total projected regional water demand under high and low demand scenarios, and also shows the administrative water supply and the drought-adjusted water supply based on 2010 data (there has since been a reduction in mining use). Future water demand projections indicate that low to moderate growth in water use is anticipated (the high projection reflects an initial drop in use due to the closure of the Chevron mine, followed by an assumed reopening). Additionally, in the Taos region surface water supplies about 80 percent of the total supply, and thus the region is very vulnerable to drought. Even without significant growth in demand, the estimated shortage in drought years is expected to range from 86,000 to 90,000 acre-feet. Strategies that the region identified for addressing agricultural surface water drought shortages and other infrastructure, water management, and water quality issues included a recharge investigation, a data repository, acequia and mutual domestic capacity building programs, and watershed, wetland, fire protection, and climate resilience strategies.

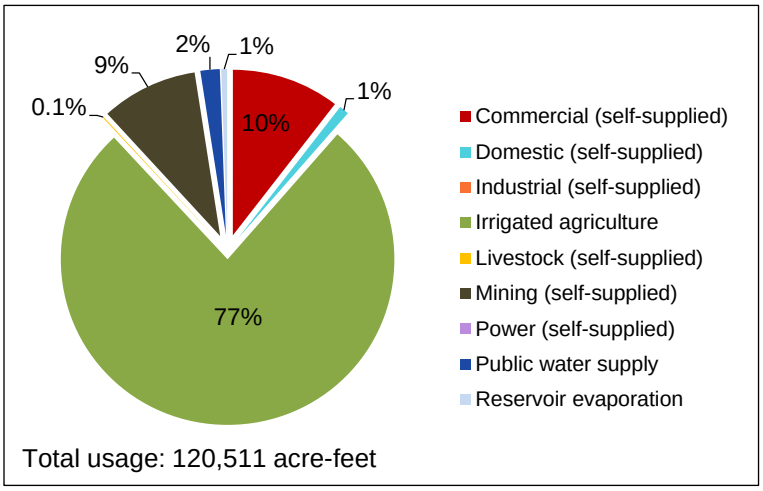


Figure ES-2. Total Regional Water Demand, 2010

Note: Tribes and Pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

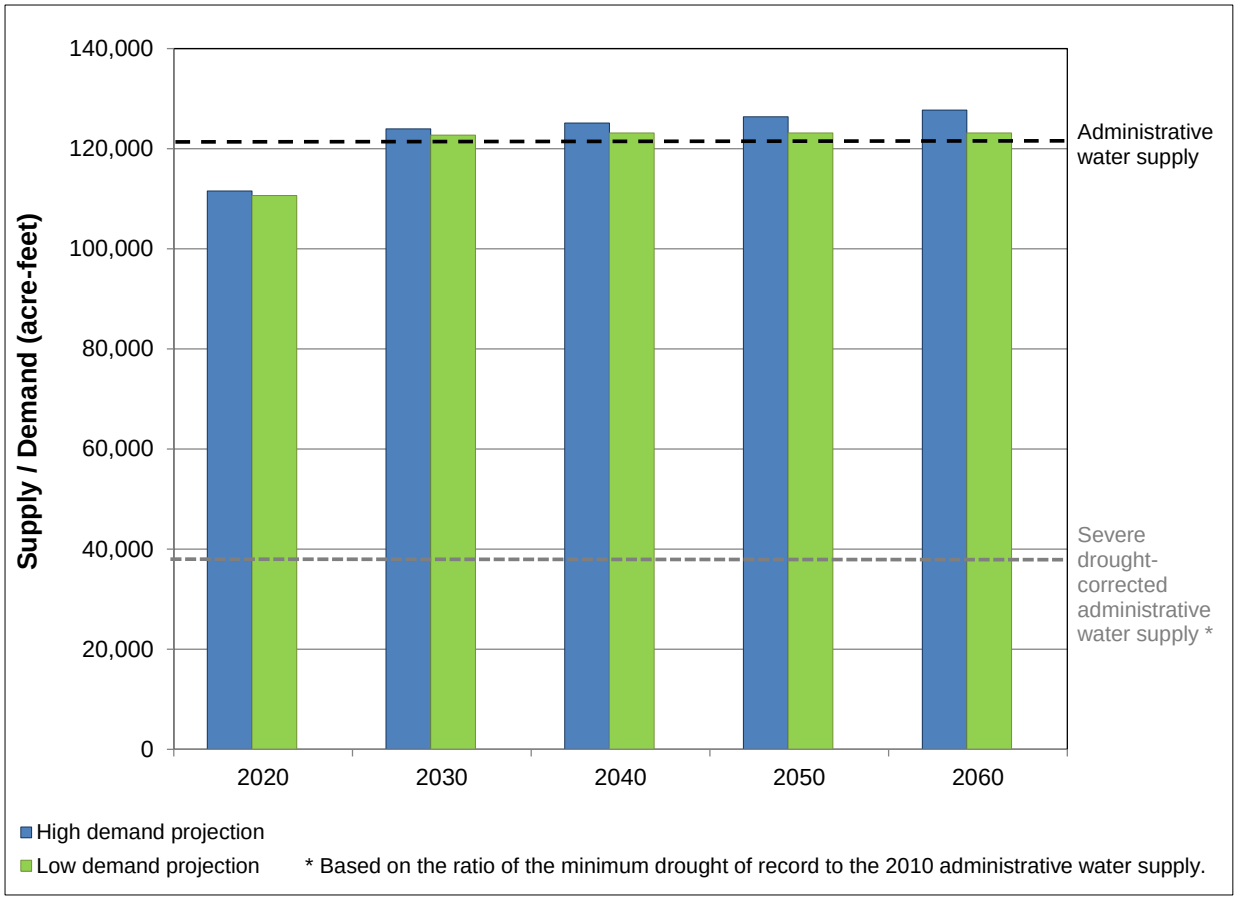


Figure ES-3. Available Supply and Projected Demand

Note: Tribes and Pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

Planning Method

For this RWP, water supply and demand information was assessed in accordance with a common technical approach, as identified in the *Updated Regional Water Planning Handbook: Guidelines to Preparing Updates to New Mexico Regional Water Plans* (where it is referred to as a common technical *platform*) (Handbook). This *common technical approach* outlines the basis for defining the available water supply and specifies methods for estimating future demand in all categories of water use:

- The method to estimate supply (referred to as the *administrative water supply* in the Handbook) is based on withdrawals of water as reported in the *New Mexico Water Use by Categories* report prepared by the New Mexico Office of the State Engineer (NMOSE). Use of the 2010 data provides a measure of supply that considers both physical supply and legal restrictions (i.e., the water is physically available for withdrawal, and its use is in compliance with water rights policies) and thus reflects the amount of water available for use by a region.

Common Technical Approach

To prepare both the regional water plans and the state water plan, the State has developed a set of methods for assessing the available supply and projected demand that can be used consistently in all 16 planning regions in New Mexico. The objective of applying this common technical approach is to be able to efficiently develop a statewide overview of the balance between supply and demand in both normal and drought conditions, so that the State can move forward with planning and funding water projects and programs that will address the State's pressing water issues.

- An estimate of supply during future droughts is also developed by adjusting the 2010 withdrawal data based on physical supplies available during historical droughts.

- Projections of future demand in nine categories of water use are based on demographic and economic trends and population projections. Consistent methods and assumptions for each category of water use are applied across all planning regions.

Public Involvement

The updated Handbook specifies that the RWP update process "shall be guided by participation of a representative group of stakeholders," referred to as the steering committee. Steering committee members provided direction for the public involvement process and relayed information about the planning effort to the water user groups they represent and other concerned or interested individuals.

In addition to the steering committee, the water planning effort included developing a master stakeholder list of organizations and individuals interested in the water planning update. This list was developed from the previous round of water planning and then expanded through efforts to

identify representatives from water user groups and other stakeholders. Organizations and individuals on the master stakeholder list were sent announcements of meetings and the RWP update process and progress.

Over the two-year update process, eight meetings were held in the Taos region. These meetings identified the program objectives, presented draft supply and demand calculations for discussion and to guide strategy development, and provided an opportunity for stakeholders to provide input on the strategies that they would like to see implemented. All steering committee meetings were open to the public and interested stakeholders, and participation from all meeting attendees was encouraged.

Key Water Issues

The key water supply updates and issues currently impacting the Taos region include the following:

- For the climate division that spans the planning region, there have been several severe to extreme droughts in recent years. This is a particular concern for water users that are dependent on surface water supplies, but drought preparedness (developing drought contingency plans and shortage sharing agreements) is important for each community and acequia in the region.

- More than 300 acequias are present in the region, and the pueblos have practiced agriculture in the region for centuries. Agricultural economic viability is still a key issue in the region.

- Due to the large amount of forested land in the region, coupled with the recent drought conditions, the threat of wildfire and subsequent sedimentation impacts on streams and reservoirs remains a key planning issue.

- The Nature Conservancy is working to develop the Rio Grande Water Fund, which if funded, will generate sustainable income for a 10- to 30-year forest restoration program through a multi-party effort. Models of debris flow risk after high-severity fire indicate that key water sources are at risk, and the goal of the program is to reduce the risk of catastrophic wildfire and subsequent sedimentation and localized water quality degradation to protect the region's water supply.

- Climate change will likely result in more severe drought conditions and associated wildfires, interspersed with more extreme precipitation events. In addition, climate change is predicted to result in less availability of water and impacts to water quality in the long-term. Efforts to increase the resilience of the Taos region watersheds will help to mitigate the impacts of climate change on the region's water supply and water quality.

- The Rio Grande is the main river in the planning region. The groundwater in the region is within the Rio Grande Underground Water Basin and is considered to be stream-connected. The Rio Grande is fully appropriated; therefore, any new diversion of surface water or groundwater requires the transfer of a valid water right or application for a new domestic or livestock well. The availability of water rights may thus be a limiting factor in meeting the future water needs of the region.

- The Village of Questa does not have adequate water rights to support its current and future needs and is actively seeking additional water rights. The Village also has infrastructure maintenance and upgrade needs.

- The Town of Red River has a good groundwater supply and pumping capacity, but needs a new storage tank and water and wastewater system upgrades.

- The Taos Pueblo Indian Water Rights Settlement Act was passed and signed into law by President Obama in 2010. The purpose of the Act was to approve and ratify the Taos Pueblo Indian Water Rights Settlement Agreement (also referred to informally as the Abeyta Settlement, after the first party on an alphabetical list of parties to the Settlement). One of the key hydrologic features of the settlement is to prevent future groundwater development in the shallow aquifer in the Taos Valley, by moving development to deeper wells, thereby avoiding impacts to some tributary streams and acequia systems. Providing for adequate treatment to address water quality issues in the deep wells will be an important part of Settlement implementation, and funding for maintenance of the deep wells is also an ongoing concern.

- Under the Taos Pueblo Indian Water Rights Settlement, impacts to the Taos Valley tributaries from groundwater pumping must be offset through use of mainstem Rio Grande water rights (San Juan-Chama water on the Rio Grande will be used for the majority of the offsets) or through a series of mitigation wells that pump and release water based on pumping effects as determined by the Settlement Groundwater Model.

- The Town of Taos is currently developing plans for new infrastructure for replacement of some wells under the terms of the Taos Pueblo Indian Water Rights Settlement and is working on water system improvements upgrades including metering, addressing well production issues, reducing leaks, and providing a source of emergency supply to Talpa and El Valle de Los Ranchos.

- The parties to the Taos Pueblo Indian Water Rights Settlement include 12 mutual domestic water associations; these groups are working to address water rights issues and system improvements.

- Taos Pueblo has received funding from the federal government and is beginning to implement some components of the Taos Pueblo Indian Water Rights Settlement Agreement.

- The 54 acequias who are parties to the Taos Pueblo Indian Water Rights Settlement continue to work on system improvements and have been challenged by limited surface supplies due to drought.

- El Prado Water and Sanitation District continues to plan for Taos Pueblo Indian Water Rights Settlement implementation and will cooperate with local users to lease water for construction of the new airport.

- Since the original plan was published, additional hydrogeologic investigations have been completed by the New Mexico Bureau of Geology & Mineral Resources, including hydrogeologic investigations of the northern Taos Plateau, the Questa area, and the southern Taos Valley.

- As part of the Taos Pueblo Indian Water Rights Settlement, a groundwater model was collaboratively developed by NMOSE and other parties involved in the Settlement, as described in the 2008 *Taos Regional Water Plan*. The modeling simulates groundwater flow in about 3,000 feet of alluvial and volcanic deposits and is intended to be used as a tool to evaluate effects of deep pumping that is part of the Settlement. Since 2008, additional modeling work has occurred including development of a superposition model for water rights administration.

- The Taos Soil and Water Conservation District (SWCD) has taken over long-term monitoring of groundwater levels in the Sunshine Valley. The long-term record indicates that there have been some slight declines in water levels in recent years, but over the long term, water levels are relatively stable and in some cases have been rising.

- Upgrades to address aging infrastructure are needed in communities throughout the region, and State funding is needed for repairs. The planning region includes 98 water systems, including many small systems such as mutual domestic water consumer associations and mobile home parks. Though the source water for these systems is generally good quality groundwater, the maintenance, upgrades, training, operation, and monitoring that is required to ensure delivery of water that meets drinking water quality standards is a financial and logistical challenge for these small systems. Achieving optimal efficiency in water system operation and infrastructure upgrades, through cooperative associations or other means, was identified as an important objective in the accepted plan and remains important to the region.

- The accepted water plan identified water quality impacts due to mining as an issue of concern. Though molybdenum mining activities in the Red River drainage ceased in the summer of 2014, there is an ongoing cleanup effort being conducted under the Superfund program, and Red River water quality is an ongoing challenge for the region. There may also be water quality impacts in the Red River drainage due to natural mineralization.

- The original water plan identified potential contamination of shallow groundwater and domestic wells due to septic tanks as a potential water quality concern. This issue is still of concern, as some areas in the region have no access to wastewater treatment infrastructure and continue to be served by domestic wells and septic tanks.

- Naturally occurring high concentrations of uranium, arsenic, and fluoride have sporadically been detected in groundwater throughout the region.

- The Taos SWCD recently completed a study of uranium in the Rio Ojo Caliente area. The study indicated that levels of uranium approaching or exceeding drinking water standards in many wells in the area originate from deep-sourced hot springs in northern Rio Arriba County.

- Water quality testing conducted by the Taos SWCD indicated that uranium levels in domestic wells in some locations south of Rio Hondo approach or exceed drinking water standards. The elevated uranium is found in alluvial fan deposits. The effects can be mitigated with simple filters for domestic wells or more expensive treatment systems for community wells.

- Water quality in the deep aquifer will require treatment. Arsenic is a primary concern, though treatment for fluoride, uranium, total dissolved solids, and/or other constituents may also be required. Funding for arsenic treatment is included as part of the federal authorization, covered in the Taos Pueblo Indian Water Rights Settlement Agreement, to develop future water supplies from the deep aquifer.

- The Federal Emergency Management Administration released new flood hazard determinations for Taos County in 2014. The new maps define hazard areas and indicate flood insurance rate boundaries.

- The Taos Pueblo Indian Water Rights Settlement allows for leasing and transfer of water rights within the limits defined in the Settlement. A mechanism is needed to effectively evaluate the technical and political aspects of water transfers in the region. The region is interested in ensuring that acequias have adequate education and protection to avoid being harmed by future transfers.

Strategies to Meet Future Water Demand

An important focus of the RWP update process is to both identify strategies and processes for meeting future water demand and consider their implementation. To help address the implementation of new strategies, a review of the implementation of previous strategies was first completed.

The 2008 Taos Regional Water Plan recommended the following strategies for meeting future water demand:

- Infrastructure development
- Water quality protection
- Public education
- Agriculture/water rights protection
- Planning for growth
- Watershed restoration
- Data collection

The steering committee reviewed each of the strategies and indicated that they are all still relevant, though some are being refocused as new recommended strategies.

During the two-year update process the Taos Steering Committee and stakeholders identified projects, programs, and policies (PPPs) to address their water issues. Some water projects were already identified through the State of New Mexico Infrastructure Capital Improvement Plan, Water Trust Board, Capital Outlay, and New Mexico Environment Department Funding process; these projects are also included in the Taos table of PPP needs. The information was not ranked or prioritized; it is an inclusive table of all of the PPPs that regional stakeholders are interested in pursuing. In the Taos region, projects identified in the PPP table are primarily water system infrastructure, irrigation system upgrades, and watershed restoration projects.

At steering committee meetings held in 2015 and 2016, the group discussed projects that would have a larger regional or sub-regional impact and for which there is interest in collaboration to seek funding and for implementation. The following key collaborative projects were identified by the steering committee and Taos region stakeholders:

- *Enhanced Recharge Investigations*. The projects would involve hydrologic studies to characterize the aquifer and to quantify the water balance for the purpose of enhancing recharge through infiltration galleries, rainwater collection, stormwater management, acequia recharge, small ponds, or other means. The studies would also consider land

regulations needed for this effort. The studies would be completed by a hydrologist at the Palemon Martinez Ranch.

- *Data Collection/Repository/Monitoring*. This project involves developing a repository of digital (PDF) format data and information as an educational resource for Taos County. Additional monitoring data will be collected and added to the repository over time. Repository data will include hydrogeologic and well completion data for deep wells for the Taos Pueblo Indian Water Rights Settlement, water quality data, including spring sampling, groundwater age data, and geochemistry, groundwater level data, NMOSE/NMISC well data, and New Mexico Bureau of Geology reports. The project will also include mentoring Taos High School students. The Taos SWCD is preparing to initiate and manage this project, with the repository to be held in their facilities.

- *Implement County Wildfire Protection Plan (CWPP)*. This project will implement and continue the CWPP based on current county and local CWPPs, periodically updating county and local plans as needed. The project will also support local Firewise programs and pursue and increase available funding for thinning and maintenance programs.

- *Forest Health and Watershed Restoration (e.g., Rio Grande Water Fund)*. This project focuses on stewardship thinning for forest and watershed health and landscape-scale restoration across jurisdictional boundaries.

- *Capacity Building for Mutual Domestics and Water and Sanitation Districts*. To strengthen the capacity of many small systems, the project includes collaborative regional support for management, capacity for metering, maintenance and expansion of infrastructure, and ability to acquire water rights.

- *Climate Change Resilience*. Projects under the Rio Grande Water Fund support climate resilience by restoring forests to a healthy state and protecting water quality. The Wetland Action Plan also supports this goal by preserving and restoring headwater wetlands, the sponges of our watershed. Carson National Forest has policies to protect wetlands, and the Natural Resources Conservation Service (NRCS) and the Taos SWCD support projects on private land. Amigos Bravos has a wetlands gem program to support climate resilience.

- *Taos County Wetland Action Plan.* This project will develop a Wetland Action Plan to identify wetlands on public and private lands in the planning region, identify priorities for protection and restoration, and establish a robust public outreach, education, and private landowner engagement strategy. The project will also identify and encourage incentives for private landowners in the planning area to protect and restore wetlands on their property; some specific avenues to consider would be conservation easements, mitigation

banking, and a preferential property tax mechanism. Rehabilitation cost share programs are supported by NRCS and Taos SWCD.

- *Preservation and Capacity Building for Acequias, Including Education and Outreach.* This project intends to protect acequia water rights for use within the region and includes education and outreach on the Taos Pueblo Indian Water Rights Settlement and the impact of adjudication, updating acequia bylaws to allow for protection from out of region transfers, addressing abandonment/forfeiture, developing water rights protection/transfer notice procedures, and educating acequias on elements of water right subfiles for protection of acequias.

The 2016 Regional Water Plan characterizes supply and demand issues and identifies strategies to meet the projected gaps between water supply and demand. This plan should be added to, updated, and revised to reflect implementation of strategies, address changing conditions, and continue to inform water managers and other stakeholders of important water issues affecting the region.

1. Introduction

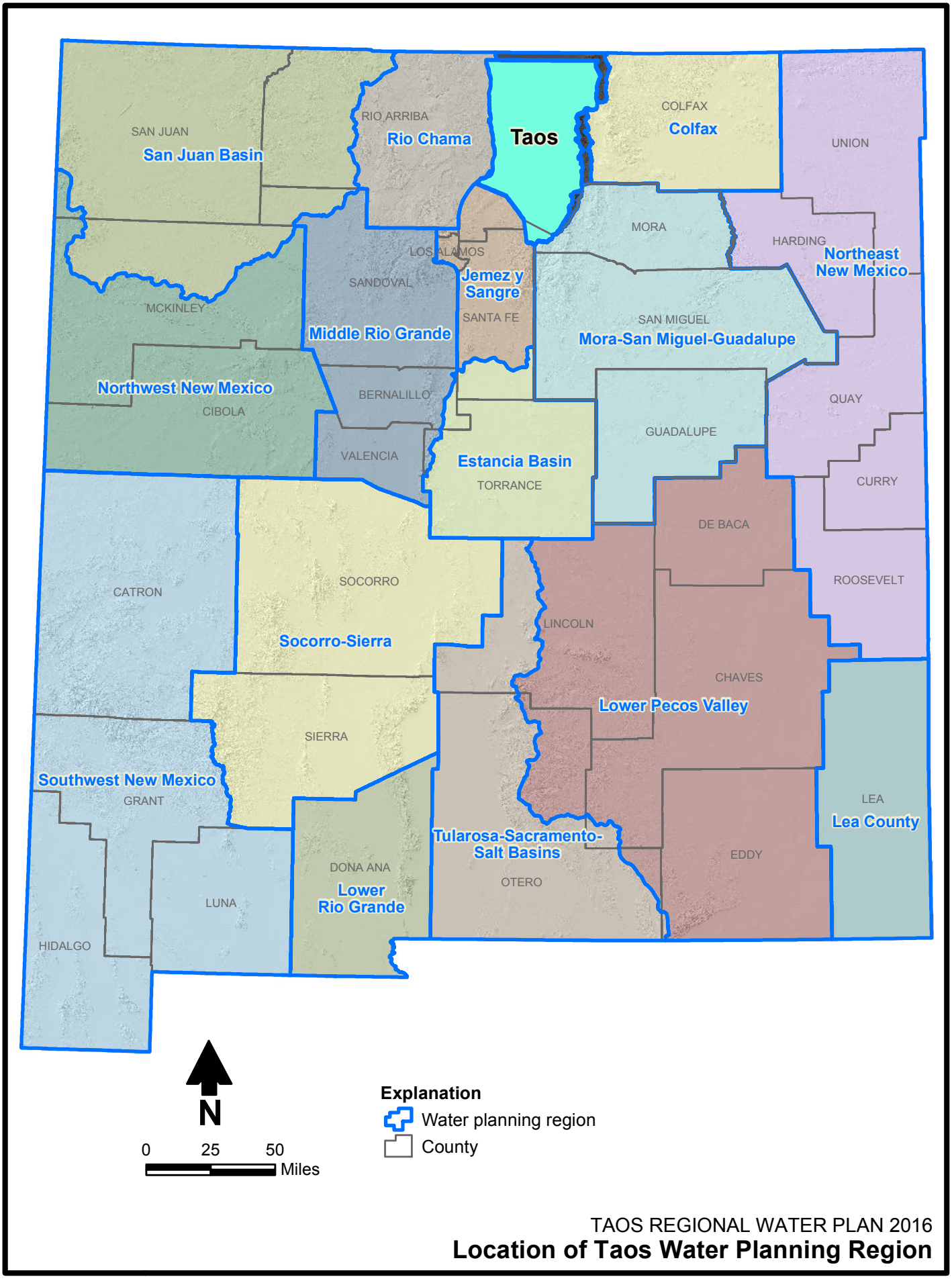
The Taos Water Planning Region, which includes all of Taos County and a portion of the Embudo watershed in southeastern Rio Arriba County (Figure 1-1), is one of 16 water planning regions in the State of New Mexico. Regional water planning was initiated in New Mexico in 1987, its primary purpose being to protect New Mexico water resources and to ensure that each region is prepared to meet future water demands. Between 1987 and 2008, each of the 16 planning regions, with funding and oversight from the New Mexico Interstate Stream Commission (NMISC), developed a plan to meet regional water needs over the ensuing 40 years. The *Taos Regional Water Plan* was completed in April 2008 and accepted by NMISC that same year (DBS&A, 2008).

The purpose of this document is to provide new and changed information related to water planning in the Taos region, as listed in the bullets below, and to evaluate projections of future water supply and demand for the region using a common technical approach applied to all 16 planning regions statewide. Accordingly, the following sections summarize key information in the 2008 plan and provide updated information regarding changed conditions and additional data that have become available. Specifically, this update:

- Identifies significant new research or data that provide a better understanding of current water supplies and demands in the Taos region.
- Presents recent water use information and develops updated projections of future water demand using the common technical approach developed by the NMISC, in order to facilitate incorporation into the New Mexico State Water Plan.
- Identifies strategies, including infrastructure projects, conservation programs, watershed management policies, or other types of strategies that will help to balance supplies and projected demands and address the Taos region's future water management needs and goals.
- Discusses other goals or priorities as identified by stakeholders in the region.

The water supply and demand information in this regional water plan (RWP) is based on current published studies and data and information supplied by water stakeholders in the region. Tribes and pueblos in New Mexico are not required to provide water use data to the State, and so tribal water use data are not necessarily reflected in this RWP update.

The organization of this update follows the template provided in the *Updated Regional Water Planning Handbook: Guidelines to Preparing Updates to New Mexico Regional Water Plans* (NMISC, 2013) (referred to herein as the Handbook):



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TAOS REGIONAL WATER PLAN 2016

Location of Taos Water Planning Region

Figure 1-1

- Information regarding the public involvement process followed during development of this RWP update and entities involved in the planning process is provided in Section 2.
- Section 3 provides background information regarding the characteristics of the Taos planning region, including an overview of updated population and economic data.
- The legal framework and constraints that affect the availability of water are briefly summarized in Section 4, with recent developments and any new issues discussed in more detail.
- The physical availability of surface water and groundwater and water quality constraints was discussed in detail in the 2008 RWP; key information from that plan is summarized in Section 5, with new information that has become available since 2008 incorporated as applicable. In addition, Section 5 presents updated monitoring data for temperature, precipitation, drought indices, streamflow, groundwater levels, and water quality, and an estimate of the administrative water supply including an estimate of drought supply.
- The information regarding historical water demand in the planning region, projected population and economic growth, and projected future water demand was discussed in detail in the 2008 RWP. Section 6 provides updated population and water use data, which are then used to develop updated projections of future water demand.

Common Technical Approach

To prepare both the regional water plans and the state water plan, the State has developed a set of methods for assessing the available supply and projected demand that can be used consistently in all 16 planning regions in New Mexico. This common technical approach outlines the basis for defining the available water supply and specifies methods for estimating future demand in all categories of water use:

- The method to estimate the available supply (referred to as the *administrative water supply* in the Handbook) is based on withdrawals of water as reported in the *NMOSE Water Use by Categories 2010* report,* which provide a measure of supply that considers both physical supply and legal restrictions (i.e., the diversion is physically available for withdrawal, and its use is in compliance with water rights policies) and thus reflects the amount of water available for use by a region. An estimate of supply during future droughts is also developed by adjusting the 2010 withdrawal data based on physical supplies available during historical droughts.
- Projections of future demands in nine categories of water use are based on demographic and economic trends and population projections. Consistent methods and assumptions for each category of water use are applied across all planning regions.

The objective of applying this common technical approach is to be able to efficiently develop a statewide overview of the balance between supply and demand in both normal and drought conditions, so that the State can move forward with planning and funding water projects and programs that will address the State's pressing water issues.

* *Tribes and Pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this plan.*

- Based on the current water supply and demand information discussed in Sections 5 and 6, Section 7 updates the projected gap between supply and demand of the planning region.
- Section 8 outlines new strategies (water programs, projects, or policies) identified by the region as part of this update, including additional water conservation measures.

Water supply and demand information (Sections 5 through 7) is assessed in accordance with a common technical approach, as identified in the Handbook (NMISC, 2013) (where it is referred to as a common technical *platform*). This common technical approach is a simple methodology that can be used consistently across all regions to assess supply and demand, with the objective of efficiently developing a statewide overview of the balance between supply and demand for planning purposes.

Four terms frequently used when discussing water throughout this plan have specific definitions related to this RWP:

- *Water use* is water withdrawn from a surface or groundwater source for a specific use. In New Mexico water is accounted for as one of the nine categories of use in the *New Mexico Water Use by Categories 2010* report prepared by the New Mexico Office of the State Engineer (NMOSE).
- *Water withdrawal* is water diverted or removed from a surface or groundwater source for use.
- *Administrative water supply* is the amount of water withdrawals in 2010 as outlined in the *New Mexico Water Use by Categories 2010* report.
- *Water demand* is the amount of water needed at a specified time.

2. Public Involvement in the Planning Process

During the past two years, the regional water planning steering committees, interested stakeholders, NMISC, and consultants to the NMISC have worked together to develop regional water plan updates. The purpose of this section is to describe public involvement activities during the regional water plan update process, guided by the Handbook, which outlined a public involvement process that allowed for broad general public participation combined with leadership from key water user groups.

2.1 The New Mexico Interstate Stream Commission's Role in Public Involvement in the Regional Water Plan Update Process

The NMISC participated in the public involvement process through a team of contractors and NMISC staff that assisted the regions in conducting public outreach. The NMISC's role in this process consisted of certain key elements:

- Setting up and facilitating meetings to carry out the regional water plan update process.
- Working with local representatives to encourage broad public involvement and participation in the planning process.
- Working to re-establish steering committees in regions that no longer had active steering committees.
- Supporting the steering committees once they were established.
- Facilitating input from the stakeholders and steering committees in the form of compiling comments to the technical sections drafted by the State and developing draft lists of projects, programs, and policies (PPPs) based on meeting input, with an emphasis on projects that could be implemented.
- Finalizing Section 8, Implementation of Strategies to Meet Future Water Demand, by writing a narrative that describes the key collaborative strategies based on steering committee direction.

This approach represents a change in the State's role from the initial round of regional water planning, beginning in the1990s through 2008, when the original regional water plans were developed. During that phase of planning, the NMISC granted regions funding to form their own regional steering committees and hire consultants to write the regional water plans, but NMISC staff were not directly involved in the process. Over time, many of the regional steering committees established for the purpose of developing a region's water plan disbanded. Funding for regional planning decreased significantly, and regions were not meeting to keep their plans current.

In accordance with the updated Handbook (NMISC, 2013), the NMISC re-established the regional planning effort in 2014 by working with existing local and regional stakeholders and organizations, such as regional councils of government, water providers, water user organizations, and elected officials. The NMISC initiated the process by hosting and facilitating meetings in all 16 regions between February and August of 2014. During these first months, through its team of consultants and working with contacts in the regions, the NMISC prepared "master stakeholder" lists, comprised of water providers and managers, local government representatives, and members of the public with a general interest in water, and assisted in

developing updated steering committees based on criteria from the Handbook and recommendations from the stakeholders. (The steering committee and master stakeholder lists for the Taos region are provided in Section 2.2.1 and Appendix 2-A, respectively.) These individuals were identified through research, communication with other water user group representatives in the region, contacting local organizations and entities, and making phone calls. Steering committees members represent the different water users groups identified in the Handbook and have water management expertise and responsibilities.

The steering committee was tasked with four main responsibilities:

- Provide input to the water user groups they represent and ensure that other concerned or interested individuals receive information about the water planning process and meetings.
- Provide direction on the public involvement process, including setting meeting times and locations and promoting outreach.
- Identify water-related PPPs needed to address water management challenges in the region and future water needs.
- Comment on the draft *Taos Regional Water Plan 2016*, as well as gather public comments. (Appendix 2-B includes a summary of comments on the technical and legal sections of the document that were prepared by NMISC [Sections 1, 3, 4, 5, 6, and 7].)

In 2016, the NMISC continued to support regional steering committees by facilitating three additional steering committee meetings open to the public in each of the 16 regions. The purpose of these meetings was to provide the regions with their draft technical sections that the NMISC had developed and for the regions to further refine their strategies for meeting future water challenges.

Throughout the regional water planning process all meetings were open to the public. Members of the public who have an interest in water were invited directly or indirectly through a steering committee representative to participate in the regional water planning process

Section 2.2 provides additional detail regarding the public involvement process for the Taos 2016 regional water plan.

2.2 Public Involvement in the Taos Planning Process

This section documents the steering committee and public involvement process used in updating the plan and documenting ideas generated by the region for future public involvement in the implementation of the plan.

2.2.1 Identification of Regional Steering Committee Members

The Handbook (NMISC, 2013) specifies that the steering committee membership include representatives from multiple water user groups. Some of the categories may not be applicable to a specific region, and the regions could add other categories as appropriate to their specific region. The steering committee representation listed in the Handbook includes:

- Agricultural – surface water user
- Agricultural – groundwater user
- Municipal government
- Rural water provider
- Extractive industry
- Environmental interest
- County government
- Local (retail) business
- Tribal entity
- Watershed interest
- Federal agency
- Other groups as identified by the steering committee

Steering committee members were identified and asked to participate through interviews, public meetings, recommendations, and outreach to specific interests. Through this outreach, the Taos Water Planning Region established a representative steering committee, the members of which are listed in Table 2-1.

The steering committee includes several state and federal agency representatives who participate as technical resources to the region. These individuals are generally knowledgeable about water issues in the region and are involved with many of the PPPs related to water management in the region. The list also includes non-profit groups who are involved in local water-related initiatives and/or have expertise such as watershed restoration or mutual domestic concerns and issues. The steering committee identified Rick Bellis, Town of Taos Manager, and Nathan Sanchez, Taos County Planner, as co-chairs.

Table 2-1. Steering Committee Members, Taos Water Planning Region

Page 1 of 2

Water User Group	Name	Organization / Representation
Agricultural – groundwater and acequias	Peter Vigil	Taos Soil and Water Conservation District
Agricultural – surface water user Acequias	Carlos Miera	Des Montes Ditch Association
	Esther Garcia	Northern Region Acequias del Norte
	Mary Mascarenas	Southern Region NM Acequia Commission Member
Rural water provider	Larry Szczech	El Salto Mutual Water
	John Painter	El Prado Water & Sanitation
	Mario Barela, President	El Valle de los Ranchos W &S
	Brian Duran, President	Mutual Domestic Water Association
	Karen Shannon	Mutual Domestic Water Association
	Pam Harris	Mutual Domestic Water Association
	Justin Friedman	La Lama Mutual Domestic Water Association
County government	Bob Romero	Taos County Water Advisory Committee
	Tom Blankenhorn	Taos County Commissioner
	Nathan Sanchez Alternate	Taos County Planner
Municipal government	Daniel Barrone	Mayor, Town of Taos
	Rick Bellis	Town of Taos Manager
	Mark Gallegos, Mayor	Village of Questa
	Linda Calhoun, Mayor	Village of Red River
	Neal King, Mayor	Village of Taos Ski Valley
	Matt Foster, Planner	Village of Taos Ski Valley
Tribal government	Gary Pine, Governor	Taos Pueblo (invited)
	Richard Mermejo, Governor	Picuris Pueblo (invited)
Environmental interest	Rachel Conn	Amigos Bravos
	Laura McCarthy	Nature Conservancy
	Simeon Herskovits	Advocates For Community & Environment
	Toner Mitchell	Trout Unlimited
Extractive industry	Tommy Lyles	Chevron Mining Corp
Federal agency (technical support to the region)	John Littlefield	U.S. Forest Service Carson National Forest
	Ryan Besser	Bureau of Land Management
State agency (technical support to the region)	Joseph Marcoline	New Mexico Environment Department
	Duncan Sill	North Central NM Economic Dev. District

Table 2-1. Steering Committee Members, Taos Water Planning Region

Page 2 of 2

Water User Group	Name	Organization / Representation
State agency (technical support to the region)	Jason Lithgow	New Mexico State Lands Office
	Ernie Lopez	New Mexico State Forestry
Local business	Erin Sanborn	Taos Green Chamber
	Catherine Moon	Real Estate Association
	Chris Staggs	Taos Ski Valley
	Gary Forrest	Sipapu Corporation
	Walt Foley	Red River Ski Valley
Academic institution	Kate O'Neill	University of New Mexico-Taos
Non-profit organization	Jacob Caldwell	Lor Foundation
	Trudy Valerio Healy	Healy Foundation
Other groups as identified by the steering committee - Regional Representative	Tony Benson	Western Region

The steering committee discussed the value of developing subcommittees and determined that the following subcommittees would be helpful to identify issues and develop strategies to address supply and demand: Watershed Subcommittee, Acequia Subcommittee, Technical Subcommittee, Mutual Domestic Subcommittee, and Public Welfare Subcommittee. These subcommittees met in between meetings without NMISC assistance and developed reports submitted to the steering committee. The Public Welfare Statement update was outside of the scope identified in the Handbook (NMISC, 2013), but the statement was updated in 2013 through the Taos County Water Board, and the subcommittee recommended inclusion of the revised Public Welfare Statement in this RWP update, as discussed in Section 8.

2.2.2 Regional Water Plan Update Meetings

All steering committee meetings and NMISC-facilitated water planning meetings were open to the public and interested stakeholders. Meetings were announced to the master stakeholder list by e-mail, and participation from all meeting attendees was encouraged. Steering committee members served as a conduit of information to others and, through their own organizational communications with other agencies, encouraged participation in the process, and steering committee members were asked to share information about the process with other stakeholders in the region. Generally, steering committee members ensured that other concerned or interested individuals received the announcement and recommended key contacts to add to the master stakeholder list throughout the planning process.

The steering committee discussed and made the following recommendations regarding meeting times and locations that would maximize public involvement:

- Meetings should be held in Taos, a central point for the region.
- Within Taos, either Town or County facilities were good meeting locations.
- Weekdays during the day were the best meeting times.

Over the two-year update process, eight meetings were held in the Taos region. A summary of each of the meetings is provided in Table 2-2.

2.2.3 Current and Future Ideas for Public Outreach during Implementation of the Regional Water Plan Update

The Taos Steering Committee identified the following process for additional public outreach:

- The Town and County will continue to post information about RWP activities on their websites.
- Meetings will continue to be rotated between the Town of Taos and Taos County. Taos County will continue to maintain the master stakeholder list.

Table 2-2. Taos Region Public Meetings

Date	Location	Purpose	Meeting Summary
FY 2014			
3/31/2014	Don Fernando Hotel Taos, NM	Kickoff meeting: Present the regional water planning update process to the region and continue to conduct outreach to begin building the steering committee.	Representatives from many of the water user groups attended the meeting and were instrumental in identifying other individuals as potential representatives for a particular group. Many of the meeting attendees were not on the master stakeholder list, and those individuals were added to the list.
FY 2015			
9/23/2014	Taos County Commission Chambers Taos, NM	Present the technical data compiled and synthesized for the region.	Data presented included population and economic trends through a series of tables, the administrative water supply, the projected future water demand, and the gap between supply and demand for both normal and drought years. In addition, the presentation reaffirmed the development of a steering committee to guide the process as outlined in the Handbook.
3/16/2015	El Taoseno Room Taos, NM	Review the update process and the timeline for completing the regional water plan (RWP) update.	The group discussed new information from the region and/or the projects, policies, programs (PPPs) that had been implemented since the 2008 plan. The steering committee membership and leadership were affirmed, with alternates named as appropriate. The group further discussed where future meetings would be held and the time that worked the best for getting the most attendance. A date was set for the next meeting and a summary of the discussion was sent to the master stakeholder list with information about the next meeting including agenda items and location, date, and time and next steps.

Table 2-2. Taos Region Public Meetings
Page 2 of 3

Date	Location	Purpose	Meeting Summary
4/29/2015	Town of Taos Taos, NM	Review projects completed since submission of the accepted plan and provide additional input. Discuss potential collaborative projects.	The group reviewed projects completed since submission of the accepted plan and provided additional input. The Watershed Subcommittee chair reported on ideas generated relative to PPPs or other issues. The group further discussed potential collaborative projects such as water system regionalization/cooperation, monitoring/data collection, watershed restoration, drought contingency planning, local and state water policy recommendations, and water quality protection.
5/21/2015	Town of Taos Taos, NM	Discuss elements that would be included in the public involvement chapter and ideas for FY 2015-2016 outreach. Review and discuss future project checklist discussed at previous meeting and sent to stakeholders.	The future project checklist was reviewed and discussed, and a deadline for sending information to the consultants was confirmed. The group participated in a brainstorming activity that helped to identify regional projects that held the potential for the greatest collaboration and effort, ranking the level of interest, although it was noted that there is no official ranking of projects for funding priority as part of the regional water planning update process. The consultants affirmed the next steps for the RWP update effort and a general idea for meeting again in FY 2015-2016. The group indicated that the Watershed Subcommittee and Acequia Subcommittee would continue to meet as needed to work on the PPPs that pertain to their area of interest, though NMISC contractors will not facilitate these meetings. The subcommittee will provide the NMISC contractors additional information as needed on the PPPs.

Table 2-2. Taos Region Public Meetings
Page 3 of 3

Date	Location	Purpose	Meeting Summary
FY 2016			
12/1/2015	Town of Town Taos, NM	Review steering committee membership and leadership. Focus on the PPPs to be included in the update.	The group reviewed the steering committee membership and suggested additional members to fill vacancies and decided that steering committee leadership would be two co-chairs, Rick Bellis, Town of Taos Manager, and Nathan Sanchez, Taos County Planner. Subcommittees that had met reported to the group. The steering committee and interested stakeholders present participated in a brainstorming activity that helped to identify and rank (although ranking of projects for funding priority is not part of the regional water planning update process) regional projects that held the potential for the greatest collaboration and effort. The consultants affirmed the next steps for the RWP update effort and a general idea for meeting again in FY 2015-2016.
1/28/2016	Taos County Commission Chambers Taos, NM	Refine the key collaborative PPP recommendations specific to Section 8.	The group identified a number of projects that would potentially have greater interest and benefit multiple stakeholders, and added additional information in a small group format using worksheets. The final meeting was scheduled for April 28, 2016.
4/28/2016	Town of Taos Council Chambers Taos, NM	Review the Public Involvement section (2) and the Section 8 key strategies and PPP list.	The group reviewed the Executive Summary, Public Involvement Section 2, Section 8 Key Strategies, consolidated comments and PPP list. Edits were made to some of the documents presented. The group decided on representatives to present the plan to the NMISC and developed ideas for implementation of their RWP.

- A flier for meetings was developed by the contractor and may be used as a template for future meetings and distribution by the steering committee.
- The RWP effort will be co-chaired by the Town of Taos and Taos County.

3. Description of the Planning Region

This section provides a general overview of the Taos Water Planning Region. Detailed information, including maps illustrating the land use and general features of the region, was provided in the 2008 RWP; that information is briefly summarized and updated as appropriate here. Additional detail on the climate, water resources, and demographics of the region is provided in Sections 5 and 6.

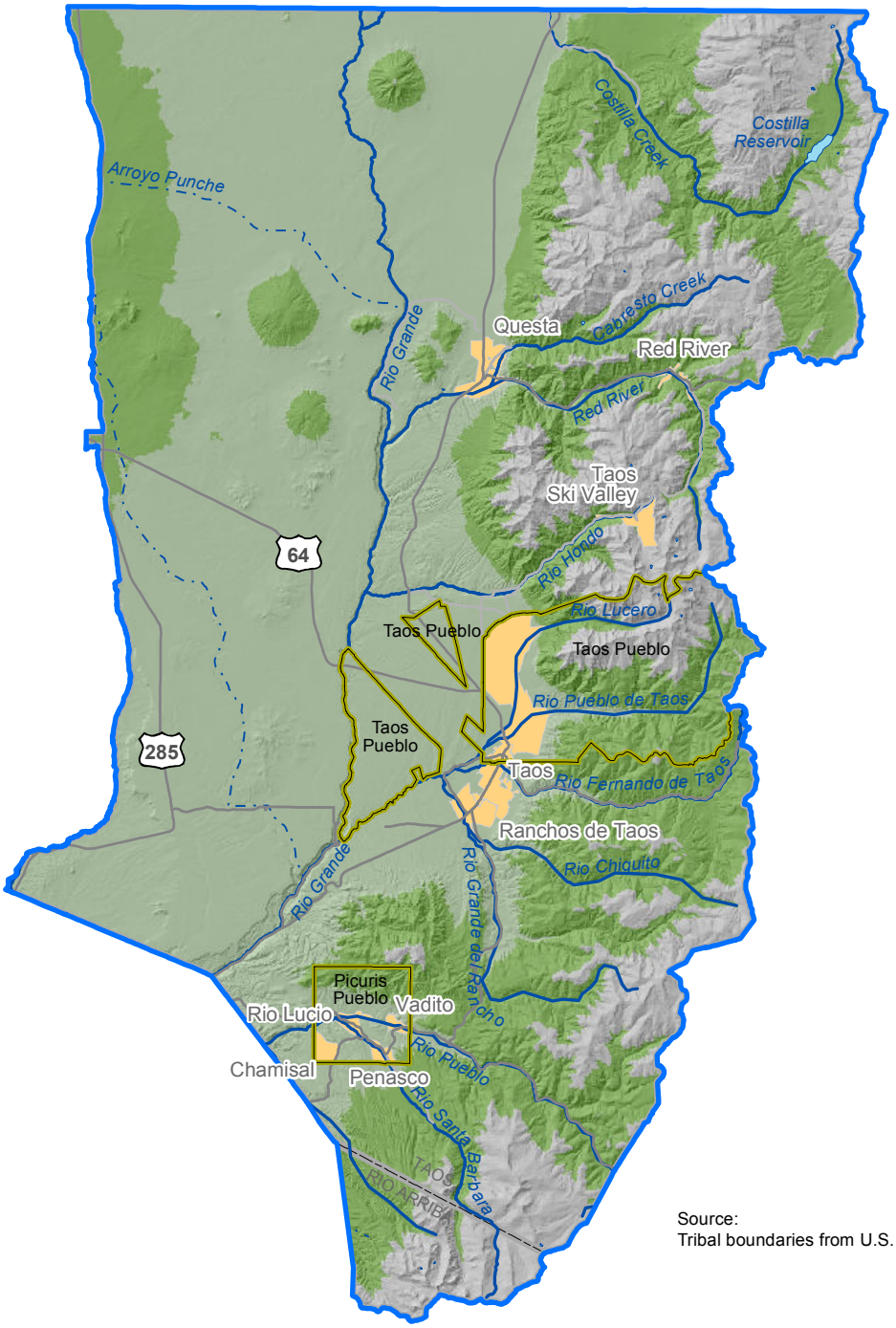
3.1 General Description of the Planning Region

The Taos water planning region is located in northern New Mexico and, as noted in Section 1, includes Taos County and a small part of Rio Arriba County. The region is bounded by Colorado to the north, Rio Arriba County (Rio Chama planning region) to the west, Rio Arriba and Mora counties to the south (Jemez y Sangre and Mora-San Miguel-Guadalupe planning regions), and Mora and Colfax counties (Mora-San Miguel-Guadalupe and Colfax planning regions) to the east. The total area of the Taos region is 2,262 square miles, distributed among the two counties as follows:

- 2,203 square miles in Taos County
- 59 square miles in Rio Arriba County

The highest point in the region is Wheeler Peak in the Sangre de Cristo Mountains, at 13,161 feet, and the lowest point is near the confluence of Embudo Creek and the Rio Grande, at about 5,830 feet (Figure 3-1). The original water plan divided the Taos region into four subregions based on watershed boundaries (DBS&A, 2008, Figure 1-2); for this update the region is being considered as a whole.

The Rio Grande Gorge cuts through the center of the region. West of the gorge, the Taos Plateau (Figure 3-1) is a basalt-capped mesa with numerous extinct volcanoes. East of the gorge, the Costilla Plains province consists of alluvial-fan and valley-fill sediments that slope gently down from and were derived from the Sangre de Cristo Mountains to the east. The Sangre de Cristo Mountains province spans the eastern side of the planning region. Vegetation on the Taos Plateau is primarily desert scrub. The vegetation in the Sangre de Cristo Mountains consists primarily of subalpine coniferous forests with a smaller portion of montane coniferous forests. Vegetation in the Costilla Plains is a mix of juniper savanna, coniferous forest, and mixed woodland. The region's primary natural resource is molybdenum, which until recently was mined at the Chevron (formerly Molycorp) facility near Questa.



Source:
Tribal boundaries from U.S. Census Bureau, 2015.

Explanation

- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region
- Tribal boundary

Elevation (ft msl)

- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000
- >10,000

N

0 5 10 Miles

TAOS
REGIONAL WATER PLAN 2016
Regional Map

Figure 3-1

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3.2 Climate

Most of the Taos region is semiarid with mild summers and cold winters. The varied terrain of Taos County, which ranges from high mountains to plateaus and valleys, results in significant climate variations. For example, temperatures range from lows that are well below 0 degrees Fahrenheit (°F) in the mountains to highs in excess of 100°F in the valley. The average temperature in the planning region ranges between 40 and 50°F. The majority of the precipitation occurs as summer thundershowers; in the Sangre de Cristo Mountains, about one-third of the average annual precipitation occurs as snowfall during December to March (Garrabrant, 1993).

3.3 Major Surface Water and Groundwater Sources

Most of the water supply in the Taos water planning region is provided by surface water. The primary surface water feature in the region is the Rio Grande and its tributaries, the most important of which are Costilla Creek, Cabresto Creek, Red River, Rio Hondo, Rio Lucero, Rio Pueblo de Taos, Rio Fernando de Taos, Rio Grande del Rancho, Rio Pueblo, and Rio Santa Barbara (Figure 3-1). The availability of water from the Rio Grande stream system is limited by the terms of the Rio Grande Compact (Section 4).

Groundwater supplies all of the communities in the region except for Red River, and numerous stock and domestic wells are also located throughout the region. The primary aquifers are located in late volcanics and Santa Fe Group sediments on the Taos Plateau, in Santa Fe Group sediments on the Costilla Plains, in alluvial sediments along river valleys, and in near-surface fractures in the Sangre de Cristo Mountains. The quantity and quality of groundwater and aquifer yields are highly variable.

The sole NMOSE-declared underground water basin (UWB) in the region is the upper part of the Rio Grande UWB, commonly referred to as the Upper Rio Grande UWB. (A declared UWB is an area of the state proclaimed by the State Engineer to be underlain by a groundwater source having reasonably ascertainable boundaries. By such proclamation the State Engineer assumes jurisdiction over the appropriation and use of groundwater from the source.) This basin is shared primarily with the Jemez y Sangre water planning region; the Middle Rio Grande planning region overlies a small part of the southwestern edge of the Upper Rio Grande UWB. A map showing this basin is provided in Section 4.7.2.

Additional information on administrative basins and surface and groundwater resources of the region is included in Section 4 and Sections 5.2 and 5.3, respectively.

3.4 Demographics, Economic Overview, and Land Use

The current population of the Taos region is 33,035. As shown in Table 3-1, the population increased from 2000 to 2013 about 10 percent, as opposed to an increase from 1990 to 2000 of 29 percent (DBS&A, 2008). The largest and most significant component of population change is an influx of retirees, second home owners, and professionals who, due to advances in technology, can work from anywhere. Due to this in-migration, as well as out-migration by younger people seeking better economic opportunities, the Taos region has seen a significant shift toward middle- and retirement-age individuals that are driving up demand for new homes, services, and health care (SWPM, 2006).

Consequently, whereas the economy of the planning area has traditionally been focused on agriculture, mining, and tourism, the current trend is toward more service and professional oriented occupations. The highest percentages of employment categories from 2008 to 2012 were in tourism-related industries, healthcare and education, professional occupations, retail trade, and construction (Table 3-1). However, irrigated agriculture, with about 300 acequias in the planning region, is still extremely important in the planning region, particularly in terms of water planning.

The Taos region consists of a large amount of land under pueblo or federal control. Two pueblos are located in the region (Taos and Picuris Pueblos), and the federal enclaves within the region consist of land managed by the Forest Service and the Bureau of Land Management (BLM). Nevertheless, a good portion of the land is privately owned. Land ownership in the region is illustrated on Figure 3-2 and outlined below:

- Federal agencies: 1,257 square miles
- Tribes: 183 square miles
- State agencies: 123 square miles
- Private entities: 700 square miles

The majority of the region's land area is forest or rangeland. The second highest percentage of land area is used for agriculture. The largest urban area is Taos; numerous other smaller communities are dispersed throughout the region.

Current statistics on the economy and land use in the Taos water planning region, compiled from the U.S. Census Bureau and the New Mexico Department of Workforce Solutions, are summarized in Table 3-1. Additional information on demographics and economics within the region is provided in Section 6.

Table 3-1. Summary of Demographic and Economic Statistics for the Taos Water Planning Region

a. Population

County	2000	2010	2013
Taos	29,979	32,937	33,035
Total Region	29,979	32,937	33,035

Source: U.S. Census Bureau, 2014a

b. Income and Employment

County	2012 Income [a]		Labor Force Annual Average 2013 [b]		
	Per Capita ($)	Percentage of State Average	Number of Workers	Number Employed	Unemployment Rate (%)
Taos	21,684	91	16,823	15,307	9.0

[a] U.S. Census Bureau, 2014c
[b] New Mexico Department of Workforce Solutions, 2014

c. Business Environment

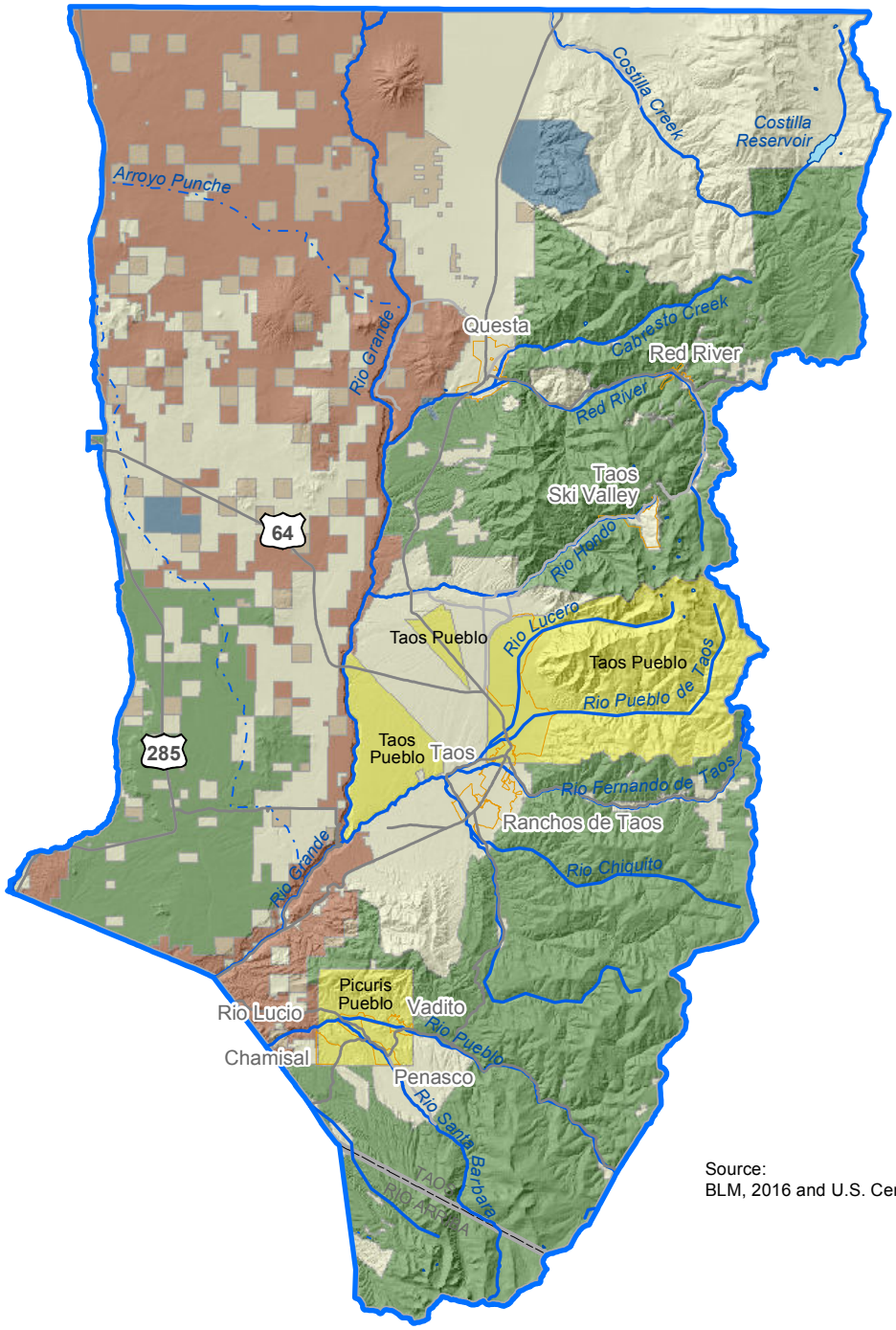
County	Industry	Number Employed	Number of Businesses
	2008-2012 [a]		*2012* [b]
Taos	Entertainment, recreation, arts, hospitality, restaurant	3,698	1,094
	Education/Healthcare	2,082	
	Professional	1,493	
	Retail trade	1,486	
	Construction	1,187	

[a] U.S. Census Bureau, 2014b
[b] U.S. Census Bureau, 2014c

d. Agriculture

County [a]	Farms / Ranches			Most Valuable Agricultural Commodities
	Number	Acreage		
		Total	Average	
Taos	983	313,414	319	Cattle, calves, Hay, other crops Aquaculture

[a] USDA NASS, 2014 (some sales data withheld to avoid disclosure for individual operations)



Source:
BLM, 2016 and U.S. Census Bureau, 2015

N

0 5 10 Miles

Explanation

- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

Land surface ownership

- Bureau of Land Management
- National Forest Service
- Tribal
- Private
- State
- State Game and Fish

TAOS
REGIONAL WATER PLAN 2016
Land Ownership

Figure 3-2

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4. Legal Issues

4.1 Relevant Water Law

4.1.1 State of New Mexico Law

Since the accepted regional water plan for the Taos Water Planning Region was published in 2008, there have been significant changes in New Mexico water law through case law, statutes, and regulations. These changes address statewide issues including, but not limited to: domestic well permitting, the State Engineer's authority to regulate water rights, administrative and legal review of water rights matters, use of settlements to allocate water resources, the rights appurtenant to a water right, and acequia water rights. New law has also been enacted to address water project financing and establish a new strategic water reserve. These general state law changes are addressed by topic area below. State law more specific to the Taos region is discussed in Section 4.1.2. This section updates the information in Section 4 (Legal Issues) and Appendix D (Legal Background) of the 2008 Plan.

4.1.1.1 Regulatory Powers of the NMOSE

In 2003, the New Mexico Legislature enacted NMSA 1978, Section 72-2-9.1, relating to the administration of water rights by priority date. The legislature recognized that "the adjudication process is slow, the need for water administration is urgent, compliance with interstate compacts is imperative and the state engineer has authority to administer water allocations in accordance with the water right priorities recorded with or declared or otherwise available to the state engineer." Section 72-2-9.1(A) (2003). The statute authorized the State Engineer to adopt rules for priority administration in a manner that does not interfere with future or pending adjudications, creates no impairment of water rights other than what is required to enforce priorities, and creates no increased depletions.

Based on Section 72-2-9.1, the State Engineer promulgated the Active Water Resource Management (AWRM) regulations in December 2004. The regulation's stated purpose is to establish the framework for the State Engineer "to carry out his responsibility to supervise the physical distribution of water to protect senior water right owners, to assure compliance with interstate stream compacts and to prevent waste by administration of water rights." 19.25.13.6 NMAC. In order to carry out this purpose, the AWRM regulations provide the framework for the promulgation of specific water master district rules and regulations. No district-specific AWRM regulations have been promulgated in the Taos region at the time of writing.

The general AWRM regulations set forth the duties of a water master to administer water rights in the specific district under the water master's control. Before the water master can take steps to manage the district, AWRM requires the NMOSE to determine the "administrable water rights" for purposes of priority administration. The State Engineer determines the elements, including

priority date, of each user's administrable water right using a hierarchy of the best available evidence, in the following order: (A) a final decree or partial final decree from an adjudication, (B) a subfile order from an adjudication, (C) an offer of judgment from an adjudication, (D) a hydrographic survey, (E) a license issued by the State Engineer, (F) a permit issued by the State Engineer along with proof of beneficial use, and (G) a determination by the State Engineer using "the best available evidence" of historical, beneficial use. Once determined, this list of administrable water rights is published and subject to appeal, 19.25.13.27 NMAC, and once the list is finalized, the water master may evaluate the available water supply in the district and manage that supply according to users' priority dates.

The general AWRM regulations also allow for the use of replacement plans to offset the depletions caused by out-of-priority water use. The development, review, and approval of replacement plans will be based on a generalized hydrologic analysis developed by the State Engineer.

The general AWRM regulations were unsuccessfully challenged in court in *Tri-State Generation and Transmission Ass'n, Inc. v. D'Antonio,* 2012-NMSC-039. In this case, New Mexico Supreme Court analyzed whether Section 72–2–9.1 provided the State Engineer with the authority to adopt regulations allowing it to administer water rights according to interim priority determinations developed by the NMOSE.

In *Tri-State* the Court held that (1) the Legislature delegated lawful authority to the State Engineer to promulgate the AWRM regulations, and (2) the regulations are not unconstitutional on separation of powers, due process, or vagueness grounds. Specifically, the Court found that establishing such regulations does not violate the constitutional separation of powers because AWRM regulations do not go beyond the broad powers vested in the State Engineer, including the authority vested by Section 72–2–9.1. The Court further found that the AWRM regulations did not violate the separation of powers between the executive and the judiciary despite the fact that the regulations allow priorities to be administered prior to an *inter se* adjudication of priority. Rather, the Legislature chose to grant quasi-judicial authority in administering priorities prior to final adjudication to the NMOSE, which was well within its discretion to do.

The Court further held that the AWRM regulations do not violate constitutional due process because they do not deprive the party challenging the regulations of a property right. As explained by the Court, a water right is a limited, usufructuary right providing only a right to use a certain amount of water established through beneficial use. As such, based on the long-standing principle that a water right entitles its holder to the use of water according to priority, regulation of that use by the State does not amount to a deprivation of a property right.

In addition to *Tri-State*, several cases that address other aspects of the regulatory powers of the NMOSE have been decided recently. Priority administration was addressed in a case concerning the settlement agreement entered into by the United States, New Mexico (State), the Carlsbad

Irrigation District (CID), and the Pecos Valley Artesian Conservancy District (PVACD) related to the use of the waters of the Pecos River. *State ex rel. Office of the State Engineer v. Lewis*, 2007-NMCA-008, 140 N.M. 1. The issues in the case revolved around (1) the competing claims of downstream, senior surface water users in the Carlsbad area and upstream, junior groundwater users in the Roswell Artesian Basin and (2) the competing claims of New Mexico and Texas users. Through the settlement agreement, the parties sought to resolve these issues through public funding, without offending the doctrine of prior appropriation and without resorting to a priority call. The settlement agreement is, in essence, an alternative administration plan designed to augment the surface flows of the lower Pecos River in order to (1) provide an increased and more stable water supply to the CID, (2) meet the State's obligations to Texas under the 1948 Pecos River Compact (Compact) and the 1988 United States Supreme Court Decree, and (3) limit the circumstances under which the United States and CID would be entitled to make a call for the administration of water right priorities. The agreement included the development of two well fields and pipeline systems to facilitate the physical delivery of groundwater directly into the Pecos River under certain conditions, the purchase and transfer to the well field of existing groundwater rights in the Roswell UWB by the State, and the purchase and retirement of irrigated land within PVACD and CID.

The Court of Appeals framed the issue as whether the priority call procedure is the exclusive means under the doctrine of prior appropriation to resolve existing and projected future water shortage issues. The Court held that Article XVI, Section 2 of the Constitution, which states that "[p]riority of appropriation shall give the better right," and Article IX of the Compact, which states that "[i]n maintaining the flows at the New Mexico-Texas state line required by this compact, New Mexico shall in all instances apply the principle of prior appropriation within New Mexico," do not require a priority call as the sole response to water shortage concerns. The Court found it reasonable to construe these provisions to permit flexibility within the prior appropriation doctrine in attempting to resolve longstanding water issues. Thus, the more flexible approach pursued by the settling parties through the settlement agreement was not ruled out in the Constitution, the Compact, or case precedent.

In relation to the NMOSE's regulatory authority over supplemental wells, in *Herrington v. State of New Mexico ex rel. State Engineer*, 2006-NMSC-014, 139 N.M. 368, the New Mexico Supreme Court clarified certain aspects of the *Templeton* doctrine. The *Templeton* doctrine allows senior surface water appropriators impaired by junior wells to drill a supplemental well to offset the impact to their water right. *See Templeton v. Pecos Valley Artesian Conservancy District*, 1958-NMSC-131, 65 N.M. 59. According to *Templeton,* drilling the supplemental well allows the senior surface right owner to keep their surface water right whole by drawing upon groundwater that originally fed the surface water supply. Thus the *Templeton* doctrine permits both the aggrieved senior surface appropriator and the junior user to divert their full share of water. The requirements for a successful *Templeton* supplemental well include (1) a valid surface water right, (2) surface water fed in part by groundwater (baseflow), (3) junior

appropriators intercepting that groundwater by pumping, and (4) a proposed well that taps the same groundwater source of the applicant's original appropriation.

In *Herrington* the Court clarified that the well at issue would meet the *Templeton* requirements if it was dug into the same aquifer that fed the surface water. The Court also clarified whether a *Templeton* well could be drilled upstream of the surface point of diversion. The Court determined that the proper placement of a *Templeton* well must be considered on a case-by-case basis, and that these supplemental wells are not necessarily required to be upstream in all cases.

Lastly, the Court addressed the difference between a *Templeton* supplemental well and a statutory supplemental well drilled under NMSA 1978, §§ 72–5–23, -24 (1985). The Court found that a statutory transfer must occur within a continuous hydrologic unit, which differs from the narrow *Templeton* same-source requirement. Although surface to groundwater transfers require a hydrologic connection, this may be a more general determination than the *Templeton* baseflow source requirement. Further, *Templeton* supplemental wells service the original parcel, while statutory transfers may apply to new uses of the water, over significant distances.

Also related to the NMOSE's regulatory authority, the Court of Appeals addressed unperfected water rights in *Hanson v. Turney*, 2004-NMCA-069, 136 N.M. 1. In *Hanson*, a water rights permit holder who had not yet applied the water to beneficial use sought to transfer her unperfected water right from irrigation to subdivision use. The State Engineer denied the application because the water had not been put to beneficial use. The permit holder argued that pursuant to NMSA 1978, § 72-12-7(A) (1985), which allows the owner of a "water right" to change the use of the water upon application to the State Engineer, the State Engineer had wrongly rejected her application. The Court upheld the denial of the application, finding that under western water law the term "water right" does not include a permit to appropriate water when no water has been put to beneficial use. Accordingly, as used in Section 72-12-7(A) the term "water right" requires the perfection of a water right through beneficial use before a transfer can be allowed.

4.1.1.2 Legal Review of NMOSE Determinations

In *Lion's Gate Water v. D'Antonio*, 2009-NMSC-057, 147 N.M. 523, the Supreme Court addressed the scope of the district court's review of the State Engineer's determination that no water is available for appropriation. In *Lion's Gate*, the applicant filed a water rights application, which the State Engineer rejected without publishing notice of the application or holding a hearing, finding that no water was available for appropriation. The rejected application was subsequently reviewed in an administrative proceeding before the State Engineer's hearing examiner. The hearing examiner upheld the State Engineer's decision on the grounds that there was no unappropriated water available for appropriation.

This ruling was appealed to the district court, which determined that it had jurisdiction to hear all matters either presented or that might have been presented to the State Engineer, as well as new evidence developed since the administrative hearing. The NMOSE disagreed, arguing that only the issue of whether there was water available for appropriation was properly before the district court. The Supreme Court agreed with the NMOSE. The Court found that the comprehensive nature of the water code's administrative process, its mandate that a hearing must be held prior to any appeal to district court, and the broad powers granted to the State Engineer clearly express the Legislature's intent that the water code provide a complete and exclusive means to acquire water rights. Accordingly, the NMOSE was correct that the district court's *de novo* review of the application was limited to what the State Engineer had already addressed administratively, in this case whether unappropriated water was available.

The Court also held that the water code does not require publication of an application for a permit to appropriate if the State Engineer determines no water is available for appropriation, because no third-party rights are implicated unless water is available. If water is deemed to be available, the State Engineer must order notice by publication in the appropriate form.

Based in large part on the holding in *Lion's Gate,* the New Mexico Court of Appeals in *Headon v. D'Antonio,* 2011-NMCA-058, 149 N.M. 667, held that a water rights applicant is required to proceed through the administrative process when challenging a decision of the State Engineer. In *Headon* the applicant challenged the NMOSE's determination that his water rights were forfeited. To do so, he filed a petition seeking declaratory judgment as to the validity of his water rights in district court, circumventing the NMOSE administrative hearing process. 2011-NMCA-058, ¶¶ 2-3. The Court held that the applicant must proceed with the administrative hearing, along with its *de novo* review in district court, to challenge the findings of the NMOSE.

Legal review of NMOSE determinations was also an issue in *D'Antonio v. Garcia*, 2008-NMCA-139,145 N.M. 95, where the Court of Appeals made several findings related to NMOSE administrative review of water rights matters. *Garcia* involved an NMOSE petition to the district court for enforcement of a compliance order after the NMOSE hearing examiner affirmed the compliance order without holding a full administrative hearing. 2008-NMCA-139, ¶¶ 2-5. The Court first found that the right to a hearing granted in NMSA 1978, § 72-2-16 (1973), did not create an absolute right to an administrative hearing. Rather, the NMOSE hearing contemplated in Section 72-2-16 could be waived if a party did not timely request such a hearing. *Id*. ¶ 9. In *Garcia* the defendant had not made such a timely request and therefore was not entitled to a full administrative hearing prior to issuance of an order by the district court.

The Court also examined the regulatory powers of the NMOSE hearings examiner; specifically, whether 19.25.2.32 NMAC allows the hearing examiner to issue a final order without the express written consent of the State Engineer. *Id*. ¶¶ 11-15. The Court held that the regulation allowed the hearing examiner to dismiss a case without the express approval of the State Engineer. *Id*. ¶ 14. Finally, the Court held that the NMOSE hearing examiner may dismiss a case without

full hearing when a party willfully fails to comply with the hearing examiner's orders. *Id*. ¶¶ 17-18. Accordingly, the Court in *Garcia* upheld the NMOSE hearing examiner's action to issue a compliance order without a full administrative hearing or final approval by the State Engineer. As such, the district court had the authority to enforce that compliance order.

4.1.1.3 Beneficial Use of Water – Non-Consumptive Use

Carangelo v. Albuquerque-Bernalillo County Water Utility Authority, 2014-NMCA-032, addressed whether a non-consumptive use of water qualifies as a beneficial use under New Mexico law and, accordingly, can be the basis for an appropriation of such water. In *Carangelo*, the NMOSE granted the Albuquerque-Bernalillo County Water Utility Authority's (Authority) application to divert approximately 45,000 acre-feet per year of Rio Grande surface water, to which the Authority had no appropriative right. The Authority intended to use the water for the non-consumptive purpose of "carrying" the Authority's own San Juan-Chama Project water, Colorado River Basin water to which the Authority had contracted for use of, to a water treatment plant for drinking water purposes. The Court of Appeals found the NMOSE erred in granting the application because the application failed to seek a new appropriation. The Authority's application sought to divert water, to which the Authority asserted no prior appropriative right, which required a new appropriation. Moreover, the Authority affirmatively asserted no beneficial use of the water. The Court remanded the matter to the NMOSE to issue a corrected permit.

The Court's decision included the following legal conclusions:

- A new non-consumptive use of surface water in a fully appropriated system requires a new appropriation of water. A "non-consumptive use" is a type of water use where either there is no diversion from a source body or there is no diminishment of the source. Neither the New Mexico Constitution nor statutes governing the appropriation of water distinguish between diversion of water for consumptive and non-consumptive uses. Because both can be beneficial uses, New Mexico's water law applies equally to either.

- The Authority did not need to file for a change in place or purpose of use for the diversion of its San Juan-Chama Project water. The Court stated that the San Juan-Chama Project water does not come from the Rio Grande Basin, and the Authority's entitlement to its beneficial use is not within the administrative scope of the Rio Grande Basin. Accordingly, the Authority already had an appropriative right to that water and did not need to file an application with the NMOSE for its use.

4.1.1.4 Impairment

Montgomery v. Lomos Altos, Inc., 2007-NMSC-002, 141 N.M. 21, involved applications to transfer surface water rights to groundwater points of diversion in the fully appropriated Rio Grande stream system. In order for a transfer to be approved, an applicant must show, among

other factors, that the transfer will not impair existing water uses at the move-to location. In *Lomos Altos*, several parties protested the NMOSE's granting of the applications, arguing that surface depletions at the move-to location caused by the applications should be considered per se impairment of existing rights. The Court found that questions of impairment are factual and cannot be decided as a matter of law, but must be determined on a case-by-case basis. In doing so, the Court held that surface depletions in a fully appropriated stream system do not result in *per se* impairment, but the Court noted that, under some circumstances, even *de minimis* depletions can lead to a finding of impairment. The Court further found that in order to determine impairment, all existing water rights at the "move-to" location must be considered.

4.1.1.5 Rights Appurtenant to Water Rights

The New Mexico Supreme Court has issued three recent opinions dealing with appurtenancy. *Hydro Resources Corp. v. Gray*, 2007-NMSC-061, 143 N.M. 142, involved a dispute over ownership of water rights developed by a mining lessee in connection with certain mining claims owned by the lessor. The Supreme Court held that under most circumstances, including mining, water rights are not considered appurtenant to land under a lease. The sole exception to the general rule that water rights are separate and distinct from the land is water used for irrigation. Therefore, a lessee can acquire water rights on leased land by appropriating water and placing it to beneficial use. Those developed rights remain the property of the lessee, not the lessor, unless stipulated otherwise in an agreement.

In a case examining whether irrigation water rights were conveyed with the sale of land, or severed prior to the sale, the Supreme Court examined New Mexico's transfer statute, NMSA 1978, § 72-5-23 (1941), along with the NMOSE regulations addressing the change of place or purpose of use of a water right, 19.26.2.11(B) NMAC. *Turner v. Bassett*, 2005-NMSC-009, 137 N.M. 381. In *Turner* the Court found that the statute, coupled with the applicable regulations and NMOSE practice, requires consent of the landowner and approval of the transfer application by the State Engineer for severance to occur. The issuance of a permit gives rise to a presumption that the water rights are no longer appurtenant to the land. A landowner who holds water rights and follows the statutory and administrative procedures to effect a severance and initiate a transfer may convey the land severed from its former water rights, without necessarily reserving those water rights in the conveyance documents.

In *Walker v. United States*, 2007-NMSC-038, 142 N.M. 45, the New Mexico Supreme Court examined the issue of whether a water right includes an implicit right to graze. After the United States Forest Service canceled the Walkers' grazing permits, the Walkers filed a complaint arguing that the United States had taken their property without just compensation in violation of the Fifth Amendment to the United States Constitution. The Walkers asserted a property right to the allotments under New Mexico state law. Specifically, the Walkers argued that the revocation of the federal permit resulted in the loss of "water, forage, and grazing" rights based on New Mexico state law and deprived them of all economically viable use of their cattle ranch.

The Court found that a stock watering right does not include an appurtenant grazing right. In doing so, the Court addressed in depth the long understood principle in western water law that water rights, unless utilized for irrigation, are not appurtenant to the land on which they are used. The Court also clarified that the beneficial use for which a water right is established does not guarantee the water right owner an interminable right to continue that same beneficial use. The Walkers could have transferred their water right to another location or another use if they could not continue with the original uses. For these reasons, the Court rejected the Walkers attempt to make an interest in land incident or appurtenant to a water right.

4.1.1.6 Deep, Non-Potable Aquifers

In 2009 the New Mexico Legislature amended NMSA 1978, § 2-12-25 (2009), to provide for administrative regulation of deep, non-potable aquifers. These groundwater basins are greater than 2,500 deep and contain greater than 1,000 parts per million of total dissolved solids. Drilling wells into such basins had previously been unregulated. The amendment requires the NMOSE to conduct hydrologic analysis on well drilling in these basins. The type of analysis required by the NMOSE depends on the use for the water.

4.1.1.7 Domestic Wells

New Mexico courts have recently decided several significant cases addressing domestic well permitting, and the NMOSE also recently amended its regulations governing domestic wells.

In *Bounds v. State ex. rel D'Antonio*, 2013-NMSC-037, the New Mexico Supreme Court upheld the constitutionality of New Mexico's Domestic Well Statute (DWS), NMSA 1978, § 72–12–1.1 (2003). Bounds, a rancher and farmer in the fully appropriated and adjudicated Mimbres basin, and the New Mexico Farm and Livestock Bureau (Petitioners), argued that the DWS was facially unconstitutional. The DWS states that the NMOSE "shall issue" domestic well permits, without determining the availability of unappropriated water or providing other water rights owners in the area the ability to protest the well. The Petitioners argued that this practice violated the New Mexico constitutional doctrine of prior appropriation to the detriment of senior water users, as well as due process of law. The Court held that the DWS does not violate the doctrine of prior appropriation set forth in the New Mexico Constitution. The Court also held that Petitioners failed to adequately demonstrate any violation of their due process rights.

In addressing the facial constitutional challenge, the Court rejected the Petitioners' argument that the New Mexico Constitution mandates that the statutory requirements of notice, opportunity to be heard, and a prior determination of unappropriated waters or lack of impairment be applied to the domestic well application and permitting process. The Court reasoned that the DWS creates a different and more expedient permitting procedure for domestic wells and the constitution does not require a particular permitting process, or identical permitting procedures, for all appropriations. While holding that the DWS was valid in not requiring the same notice, protest, and water availability requirements as other water rights applications, the court confirmed that

domestic well permits can be administered in the same way as all other water rights. In other words, domestic wells do not require the same rigors as other water rights when permitted but, when domestic wells are administered, constitutionally mandated priority administration still applies. Thus the DWS, which deals solely with permitting and not with administration, does not conflict with the priority administration provisions of the New Mexico Constitution.

The Court also found that the Petitioners failed to prove a due process violation because they did not demonstrate how the DWS deprived them of their water rights. Specifically, Bounds failed to show any actual impairment, or imminent future impairment, of his water rights. Bounds asserted that any new appropriations must necessarily cause impairment in a closed and fully appropriated basin, and therefore, granting any domestic well permit had the potential to impair his rights. The Court rejected this argument, finding that impairment must be proven using scientific analysis, not simply conclusory statements based on a bright line rule that impairment always occurs when new water rights are permitted in fully appropriated basins.

Two other significant domestic well decisions addressed domestic well use within municipalities. In *Smith v. City of Santa Fe*, 2007-NMSC-055, 142 N.M. 786, the Supreme Court examined the authority of the City of Santa Fe to enact an ordinance restricting the drilling of domestic wells. The Court held that under the City's home rule powers, it had authority to prohibit the drilling of a domestic well within the municipal boundaries and that this authority was not preempted by existing state law.

Then in *Stennis v. City of Santa Fe,* 2008-NMSC-008, 143 N.M. 320, Santa Fe's domestic well ordinance was tested when a homeowner (Stennis) applied for a domestic well permit with the NMOSE, but did not apply for a permit from the City. In examining the statute allowing municipalities to restrict the drilling of domestic wells, the Court found that municipalities must strictly comply with NMSA 1978, § 3–53–1.1(D) (2001), which requires cities to file their ordinances restricting the drilling of domestic water wells with the NMOSE. On remand, the Court of Appeals held that Section 3-53-1.1(D) does not allow for *substantial* compliance. *Stennis v. City of Santa Fe*, 2010-NMCA-108, 149 N.M. 92. Rather, strict compliance is required and the City must have actually filed a copy of the ordinance with the NMOSE.

In addition to the cases addressing domestic wells, the regulations governing the use of groundwater for domestic use were substantially amended in 2006 to clarify domestic well use pursuant to NMSA 1978, § 72-12-1.1. 19.27.5.1 et seq. NMAC. The regulations:

1. Limit the amount of water that can be used pursuant to a new domestic well permit to:
    - 1.0 acre feet per year for a single household use (can be increased to up to 3.0 acre feet per year if the applicant can show that the combined diversion from domestic wells will not impair existing water rights).

- 1.0 acre feet per year for each household served by a well serving more than one household, with a cap of 3.0 acre feet per year if the well serves three or more households.
- 1.0 acre feet per year for drinking and sanitary purposes incidental to the operations of a governmental, commercial, or non-profit facility as long as no other water source is available. The amount of water so permitted is subject to further limitations imposed by a court or a municipal or county ordinance.

The amount of water that can be diverted from a domestic well can also be increased by transferring an existing water right to the well. 19.27.5.9 NMAC.

2. Require mandatory metering of all new domestic wells under certain conditions, such as when wells are permitted within a domestic well management area, when a court imposes a metering requirement, when the water use is incidental to the operations of a governmental, commercial, or non-profit facility, and when the well serves multiple households. 19.27.5.13(C) NMAC.

3. Allow for the declaration of domestic well management areas when hydrologic conditions require added protections to prevent impairment to valid, existing surface water rights. In such areas, the maximum diversion from a new domestic well cannot exceed, and may be less than, 0.25 acre-feet per year for a single household and up to 3.0 acre-feet per year for a multiple household well, with each household limited to 0.25 acre-feet per year. The State Engineer has not declared any domestic well management areas in the planning region.

4.1.1.1 Water Project Financing

The Water Project Finance Act, Chapter 72, Article 4A NMSA 1978, outlines different mechanisms for funding water projects in water planning regions. The purpose of the Act is to provide for water use efficiency, resource conservation, and the protection, fair distribution, and allocation of New Mexico's scarce water resources for beneficial purposes of use within the state. The Water Project Finance Act creates two funds: the Water Project Fund, NMSA 1978, § 72-4A-9 (2005), and the Acequia Project Fund, NMSA 1978, § 72-4A-9.1 (2004). Both funds are administered by the New Mexico Finance Authority. The Water Trust Board recommends projects to the Legislature to be funded from the Water Project Fund.

The Water Project Fund may be used to make loans or grants to qualified entities (broadly defined to include public entities and Indian tribes and pueblos). To qualify for funding, the project must be approved by the Water Trust Board for one of the following purposes: (1) storage, conveyance or delivery of water to end users, (2) implementation of federal Endangered Species Act of 1973 collaborative programs, (3) restoration and management of watersheds, (4) flood prevention, or (5) water conservation or recycling, treatment, or reuse of water as provided by law. NMSA 1978, § 72-4A-5(B) (2011). The Water Trust Board must give priority to projects that (1) have been identified as being urgent to meet the needs of a regional

water planning area that has a completed regional water plan accepted by the NMISC, (2) have matching contributions from federal or local funding sources, and (3) have obtained all requisite state and federal permits and authorizations necessary to initiate the project. NMSA 1978, § 72-4A-5.

The Acequia Project Fund may be used to make grants to acequias for any project approved by the Legislature.

The Water Project Finance Act directed the Water Trust Board to adopt regulations governing the terms and conditions of grants and loans recommended by the Board for appropriation by the Legislature from the Water Project Fund. The Board promulgated implementing regulations, 19.25.10.1 et seq. NMAC, in 2008. The regulations set forth the procedures to be followed by the Board and New Mexico Finance Authority for identifying projects to recommend to the Legislature for funding. The regulations also require that financial assistance be made only to entities that agree to certain conditions set forth in the regulations.

4.1.1.2 The Strategic Water Reserve

In 2005, the New Mexico Legislature enacted legislation to establish a Strategic Water Reserve, NMSA 1978, § 72-14-3.3 (2007). Regulations implementing the Strategic Water Reserve statute were also implemented in 2005. 19.25.14.1 et seq. NMAC.

The statute authorizes the Commission to acquire water rights or storage rights to compose the reserve. Section 72-14-3.3(A). Water in the Strategic Water Reserve can be used for two purposes: (1) to comply with interstate stream compacts and court decrees and (2) to manage water for the benefit of endangered or threatened species or to avoid additional listing of species. Section 72-14-3.3(B). The NMISC may only acquire water rights that have sufficient seniority and consistent, historical beneficial use to effectively contribute to the purpose of the Reserve. The NMISC must annually develop river reach or groundwater basin priorities for the acquisition of water rights for the Strategic Water Reserve. The Middle Rio Grande is a priority basin for the NMISC.

4.1.1.3 Acequia Water Use

Two recent cases by New Mexico courts address the issue of acequia water use. *Storm Ditch v. D'Antonio*, 2011-NMCA-104, 150 N.M. 590, examined the process for transferring a landowner's water rights from a community acequia to a municipality. The Court found that actual notice of the transfer application to the acequia was not mandated by statute; instead, publication of the landowner's transfer application provided sufficient notice to the acequia to inform it of the proposed transfer. Further, the statute requiring that the transfer applicant file an affidavit stating that no rules or bylaws for a transfer approval had been adopted by the acequia was not intended to prove notice. Rather, the statute was directed at providing the State Engineer with assurance that the applicant had met all requirements imposed by acequia bylaws before action was taken on the application, not in providing notice.

Pena Blanca Partnership v. San Jose Community Ditch, 2009-NMCA-016, 145 N.M. 555, involved attempts to transfer water rights from agricultural uses appurtenant to lands served by two acequias to non-agricultural uses away from the acequias. The acequias denied the water rights owners' (Owners) requests to make these changes pursuant to their authority under NMSA 1978, § 73-2-21(E) (2003). The Owners appealed the acequias decision to district court. On appeal, the standard of review listed in Section 73–2–21(E) only allowed reversal of the acequia commissioners if the court found they had acted fraudulently, arbitrarily or capriciously, or not in accordance with law.

The Owners challenged this deferential standard of review in the Court of Appeals based on two grounds. First, the Owners argued that the *de novo* review standard in Article XVI, Section 5 of the New Mexico Constitution applied to the proposed transfers at issue, not the more deferential standard found in Section 73-2-21(E). The Court disagreed and found that the legislature provided for another review procedure for the decisions of acequia commissioners by enacting Section 73–2–21(E).

The Owners second assertion was that the deferential standard of review in Section 73-2-21(E) violated the equal protection clause of Article II, Section 18 of the New Mexico Constitution. The Owners argued that their equal protection guarantees were violated because water rights transfers out of acequias were treated differently than other water rights transfers. The court again disagreed, finding that although other determinations of water rights are afforded a *de novo* hearing in the district court, since the Owners still had access to the courts and the right of appeal, there were no equal protection violations.

4.1.1.8 Water Conservation

Guidelines for drafting and implementing water conservation plans are set forth in NMSA 1978, § 72-14-3.2 (2003). By statute, neither the Water Trust Board nor the New Mexico Finance Authority may accept an application from a covered entity (defined as municipalities, counties, and any other entities that supply at least 500 acre-feet per annum of water to its customers, but excluding tribes and pueblos) for financial assistance to construct any water diversion, storage, conveyance, water treatment, or wastewater treatment facility unless the entity includes a copy of its water conservation plan.

The water conservation statute primarily supplies guidance to covered entities, as opposed to mandating any particular action. For example, the statute provides that the covered entity determines the manner in which it will develop, adopt, and implement a water conservation plan. The statute further states that a covered entity "shall consider" either adopting ordinances or codes to encourage conservation, or otherwise "shall consider" incentives to encourage voluntary compliance with conservation guidelines. The statute then states that covered entities "shall consider, and incorporate in its plan if appropriate, . . . a variety of conservation measures," including, in part, water-efficient fixtures and appliances, water reuse, leak repairs, and water rate structures encouraging efficiency and reuse. Section 72-14-3.2(D).

4.1.1.9 Municipal Condemnation

NMSA 1978, § 3-27-2 (2009) was amended in 2009 to prohibit municipalities from condemning water sources used by, water stored for use by, or water rights owned or served by an acequia, community ditch, irrigation district, conservancy district, or political subdivision of the state.

4.1.1.10 Subdivision Act

The Subdivision Act, NMSA 1978, § 47-6-11.2 (2013), was amended in 2013 to require proof of water availability prior to final approval of a subdivision plat. Specifically, the subdivider must (1) present the county with NMOSE-issued water use permits for the subdivision or (2) prove that the development will hook up to a water provider along with an opinion from the State Engineer that the subdivider can fulfill the water use requirements of the Subdivision Act. Previously the county had discretion to approve subdivision plats without such proof that the water rights needed for the subdivision were readily available. These water use requirements apply to all subdivisions of ten or more lots. The Act was also amended to prohibit approval of a subdivision permit if the water source for the subdivision is domestic wells.

4.1.2 State Water Laws and Administrative Policies Affecting the Region

In New Mexico, water is administered generally by the State Engineer, who has the "general supervision of waters of the state and of the measurement, appropriation, distribution thereof and such other duties as required." NMSA 1978, § 72-2-1 (1982). To administer water throughout the state the State Engineer has several tools at its disposal, including designation of water masters, declaration of UWBs, and use of the AWRM rules, all of which are discussed below, along with other tools used to manage water within regions.

4.1.2.1 Water Masters

The State Engineer has the power to create water master districts or sub-districts by drainage area or stream system and to appoint water masters for such districts or sub-districts. NMSA 1978, § 72-3-1 (1919). Water masters have the power to apportion the waters in the water master's district under the general supervision of the State Engineer and to appropriate, regulate, and control the waters of the district to prevent waste. NMSA 1978, § 72-3-2 (2007). Currently, there is a Water Master appointed to administer the Rio Costilla in the planning region.

4.1.2.2 Groundwater Basin Guidelines

The NMOSE has declared UWBs and implements guidelines in those basins for the purpose of carrying out the provisions of the statutes governing underground waters. *See* NMAC 19.27.48.6. As noted earlier, the sole NMOSE-declared UWB in the region is the upper part of the Rio Grande UWB, commonly referred to as the Upper Rio Grande UWB (Figure 4-1). No basin guidelines have been formally adopted for the Upper Rio Grande UWB. Statewide guidelines for assessing drawdown are available.

N

0 5 10 Miles

Explanation

- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

NMOSE-declared groundwater basin

- Rio Grande

NMOSE groundwater model

- Espanola
- Taos

TAOS
REGIONAL WATER PLAN 2016

NMOSE-Declared Groundwater Basins and Groundwater Models

Figure 4-1

S:\PROJECTS\WR12.0165_STATE_WATER_PLAN_2012\GIS\MXDS\FIGURES_2016\TAOS\FIG4-1_GW_BASINS_MODELS.MXD 4/27/2016

4.1.2.3 AWRM Implementation in the Basin

No priority basins for implementation of AWRM regulations have been designated in the planning region.

4.1.2.4 Special Districts in the Basin

Special districts are various districts within the region having legal control over the use of water in that district. All are subject to specific statutes or other laws concerning their organization and operation. In the Taos planning region, special districts include several acequias, which are governed by NMSA 1978, §§ 73-2-1 through 68, including the Taos Valley Acequia Association and its 55 member acequias. The region also includes soil and water conservation districts, which are governed by Sections 73-20-25 through 48. Additionally, the region includes water and sanitation districts, including the El Prado Water & Sanitation District and the Twining Water & Sanitation District, which are governed by Sections 73-21-1 through -55.

4.1.2.5 State Court Adjudications in the Basin

Not applicable.

4.1.3 Federal Water Laws

The law of water appropriation has been developed primarily through decisions made by state courts. Since the accepted plan was published in 2008, several federal cases have been decided examining various water law questions. These cases are too voluminous to include here, and many of the issues in the cases will not apply directly to the region. However, New Mexico is a party to one original jurisdiction case in the U.S. Supreme Court involving the Rio Grande Compact and waters of the Lower Rio Grande. Because of its importance to the entire state, especially those regions that include the Rio Grande as a surface water source like the Taos planning region, it is included here.

In *Texas v. New Mexico and Colorado*, No. 141 Original (U.S. Supreme Court, 2014), Texas alleges that New Mexico has violated the Rio Grande Compact by intercepting water Texas is entitled to under the Compact through groundwater pumping and surface diversions downstream of Elephant Butte Reservoir but upstream of the New Mexico-Texas state line. Colorado is also a defendant in the lawsuit as it is a signatory to the Rio Grande Compact. The United States has intervened as a Plaintiff in the case. Elephant Butte Irrigation District and El Paso County Water Improvement District Number One have both sought to intervene in the case as well, claiming that their interests are not fully represented by the named parties. The motions to intervene along with a motion to dismiss filed by New Mexico are currently pending.

4.1.3.1 Federal Reservations

The doctrine of federally reserved water rights was developed over the course of the 20th Century. Simply stated, federally reserved rights are created when the United States sets aside

land for specific purposes, thereby withdrawing the land from the general public domain. In doing so, there is an implied, if not expressed, intent to reserve an amount of water necessary to fulfill the purpose for which the land was set aside. Federally reserved water rights are not created, or limited, by state law.

Federally reserved water rights on Indian lands are known as "*Winters* reserved rights." The *Winters* Doctrine provides that at the time the United States established an Indian reservation, it also reserved sufficient water to provide for the reservation as a permanent homeland. *Winters v. United States*, 207 U.S. 564 (1908). Neither the priority date nor the amount of *Winters* reserved rights is based on the historic actual beneficial use of water. Under the *Winters* Doctrine, the priority date is based on the date the federal government established the Indian reservation. A *Winters* reserved right is quantified based on the amount of water needed to fulfill the purposes of the reservation. In 1963, the United States Supreme Court adopted the "practically irrigable acreage" standard for quantifying federal Indian reserved water rights through a determination of the number of acres that can be practically or feasibly irrigated on the reservation. *Arizona v. California*, 376 U.S. 546 (1963). In New Mexico, courts have faced a different question in the determination of Pueblo Indian water rights. Although one federal district court recognized historically irrigated acreage as the basis for determining the quantity of a pueblo's water right, there is no established law for determining Pueblo Indian water rights. *See New Mexico ex rel. State Engineer v. Aamodt, et al.*, 6:6-CV-6639 (D.N.M.).

Lands with federal reserved rights or aboriginal rights within the Taos planning region include the following:

- Taos Pueblo
- Picuris Pueblo
- Carson National Forest, including wilderness designations
- Bureau of Land Management lands

Also, certain federal designations that could impact water use have been made within the Taos planning region.

- Public Law 109-338, the National Heritage Areas Act of 2006, designated Rio Arriba, Santa Fe, and Taos counties as the Northern Río Grande National Heritage Area to help tribal and local governments and other public and private entities conserve and sustain cultural, historical, archaeological, and natural resources.

- The Rio Grande del Norte National Monument was designated by Presidential Proclamation on March 25, 2013 pursuant to Section 2 of the Antiquities Act of June 8, 1906. 34 Stat. 225, 16 U.S.C. 431. The Bureau of Land Management is currently preparing a management plan for the National Monument that will provide management direction to ensure the protection and restoration of cultural, ecological, geological, and

wildlife values and their associated landscapes for which the National Monument was designated. The plan will also consider opportunities for continued traditional uses of the National Monument lands and resources, including wood gathering, livestock grazing, and recreation, as well as the potential for new land use authorizations.

4.1.3.2 Interstate Stream Compacts

Interstate compacts become federal law once ratified by Congress. Two compacts allocate water in the region—the Rio Grande and Costilla Creek compacts—and are discussed at length in Sections 4.5.1 and 4.5.2 of the 2008 RWP.

As discussed above, the three party states to the Rio Grande Compact are currently involved in litigation over allegations by Texas that New Mexico has violated the terms of the Compact. The allegations primarily involve actions in the Lower Rio Grande of New Mexico. However, the outcome of the suit may affect the upper reaches of the Rio Grande in New Mexico, especially as related to storage and relinquishment credits.

4.1.3.3 Treaties

One treaty indirectly governs water use in the Taos region: the Convention with Mexico, May 21, 1906, 34 Stat. 2953, T.S. No. 455, 1 Malloy 1202. This Treaty provides for the distribution between the United States and Mexico of the waters of the Rio Grande in the international reach of the river between the El Paso-Juárez Valley and Fort Quitman, Texas. Although this reach is below the Taos region, any use of water upstream of the international reach may impact the downstream distribution of water.

Also of importance to water rights administration in the region, is the Treaty of Guadalupe Hidalgo, entered into on February 2, 1848 between the United States and Mexico. 9 Stat. 922. The treaty provides that "property of every kind" of the Mexicans shall be "inviolably respected." Accordingly, water rights established prior to 1848, which includes many of the water rights in the region, are protected under the treaty. The Treaty of Guadalupe Hidalgo is discussed in depth in the 2008 RWP, Section 4.1.6.

4.1.3.4 Federal Water Projects

The San Juan-Chama Project is located outside of the planning region. However, the Project does have impacts on the region because the Taos Settlement Agreement in the Abeyta Adjudication, discussed below, uses San Juan-Chama Project water as part of the Agreement. More discussion of the Settlement Agreement and how San Juan-Chama Project water is incorporated into the Agreement is provided in the 2008 RWP, Section 4.5.3. For a full description of the project, refer to the Rio Chama RWP.

4.1.1.4 Federal Adjudications and Decrees in the Basin

4.1.3.4.1 Abeyta Adjudication

As discussed in depth in the 2008 Plan, Section 4.5.3, all water rights in the Rio Pueblo de Taos and the Rio Hondo stream systems are being adjudicated in the consolidated lawsuits of *State of New Mexico ex rel. State Engineer, et al. v. Eduardo Abeyta and Celso Arellano, et al.*, U.S. District Court Nos. 69cv7896 BB and 69cv7939 (Consolidated) (commonly referred to as the *Abeyta* adjudication). As part of the adjudication, the Taos Settlement was entered into. See Section 4.5.3.1 of the 2008 RWP. An initial Settlement Agreement was signed in May 2006, and following the passage of the Taos Settlement Act of December 8, 2010, P.L. No. 111-291, § 501, et seq., a final Settlement Agreement conforming to the provisions of the Act was signed by all parties in January 2013. The Court is currently conducting an expedited *inter se* proceeding to determine whether to enter the proposed Final Judgment and Decree adjudicating the Pueblo's water rights according to the terms of the Settlement Agreement. Notice was provided to all water rights claimants in the Rio Honda and Rio de Taos stream systems of the opportunity to review the Settlement and proposed decrees and to file objections with the Court. Objections have been filed and briefed and a Special Master Report issued. Pursuant to the Settlement Act, the Court must enter the Partial Final Judgment and Decree by March 31, 2017.

4.1.3.4.2 Aamodt Adjudication

Also discussed in the 2008 RWP is the Nambe/Pojoaque/Tesuque adjudication, *State of New Mexico v. Aamodt, et al.*, No. 66cv06639 MV/WPL. *See* 2008 RWP, Section 4.5.4.1. Although technically outside the planning region, the *Aamodt* adjudication does impact water planning in the region. On May 3, 2006, the State of New Mexico, the Pueblos of Nambe, Tesuque, Pojoaque, and San Ildefonso, the County of Santa Fe, and the City of Santa Fe executed a Settlement Agreement to resolve the claims of the four Pueblos to the use of waters in the Nambe- Pojoaque-Tesuque stream system ('N-P-T), a tributary of the Rio Grande in north-central New Mexico. Federal legislation approving the Settlement Agreement was enacted into law on December 8, 2010. The settlement will finally determine the water rights of the four Pueblos in the ongoing adjudication of water rights in the N-P-T. Specifically, the settlement may affect the Taos region because it requires the United States to acquire 2,500 acre-feet per year of imported water for the use of the four pueblos included in the agreement. Also, the settlement requires Santa Fe County to acquire 750 acre-feet per year of imported water for the benefit of future non-pueblo water users of the N-T-P. Pursuant to this requirement, Santa Fe County is attempting to transfer water out of the planning region, referred to as the Top of the World water rights transfer. The Top of the World water rights transfer is an attempt by the county to move water rights located in Taos County downstream to meet water requirements of the Aamodt Settlement. The application to move these water rights has been protested and will be the subject of administrative and, potentially, judicial proceedings.

4.1.3.4.3 Red River Adjudication

The Red River Final Judgment and Decree on the United States' Water Rights was entered June 1, 1992; the Final Judgment and Decree for Non-Federal Water Rights was entered December 1, 2000. *State of New Mexico et al. v. Molycorp, Inc. et al*, CIV No. 72-9780 JC. The Red River Adjudication is discussed in depth in the 2008 RWP, Section 4.6.

4.1.3.4.4 Costilla Decree of 1911

The Costilla Decree of 1911 and its adjudication of the rights on Costilla Creek is discussed in the 2008 RWP, Section 4.6.

4.1.4 Tribal Law

Neither the Picuris Pueblo nor the Taos Pueblo has a water code.

4.1.5 Local Law

Local laws have been implemented by both municipalities and counties within the planning region. General provisions regarding the regulation of water by cities and counties are discussed at length in the 2008 RWP, Appendix D, Section D.2.5. More specific regulation and guidance for the county and for municipalities in the region are set forth below.

4.1.5.1 Taos County

In Taos County, a comprehensive plan and two ordinances govern water use.

The *Taos County Comprehensive Plan Update*, adopted October 4, 2004, outlines a number of goals and strategies relating to water use. The goals set forth in the plan include (1) securing, protecting, and maintaining safe and sustainable water quality and quantity through effective and coordinated watershed and aquifer management, (2) restoring and protecting rivers, arroyos and streams, and, (3) preserving irrigated lands and acequias from diminishment in quantity and quality. Strategies to achieve these goals include (1) promoting best management practices to protect and sustain watersheds in the region, (2) promoting active water administration, (3) regulating land and water development pursuant to the New Mexico Subdivision Act and Taos County subdivision regulations, (4) imposing restrictions on domestic well use, and (5) developing a water conservation plan.

Two county ordinances may also impact water use in the region.

- Ordinance No. 2010-4 calls for the formation of an advisory committee to address public welfare impacts of water appropriations and changes in point of diversion, place, or purpose of use of water.

- The County of Taos, New Mexico Land Use Regulations are found in Ordinance No. 2014-1. Appendix 2 of the regulations sets forth the water supply requirements for major developments in the county.

4.1.5.2 Town of Taos

Taos regulates water use through its Town Code. The code includes the Town's authority to impose drought restrictions and water rationing, §13.04.030, mandates that applicants for municipal service must transfer water rights to the Town, §13.04.040, and prohibits the drilling of domestic water wells within 300 feet of a municipal water line, §13.04.060.

4.1.5.3 Village of Taos Ski Valley

The Village of Taos Ski Valley regulates water use through Ordinance 04-038. The ordinance mandates that applicants for municipal service must transfer water rights to the Village, §1.5, and prohibits the drilling of domestic water wells within 300 feet of a municipal water line, §1.7.

4.1.5.4 Town of Red River

Red River has no specific ordinances relating to water use.

4.1.5.5 Village of Questa

Questa has no specific ordinances relating to water use.

4.1.5.6 Rio Arriba County

While only a small portion of Rio Arriba County is included in the planning region, it is important to address the County's water use regulations. Water use in Rio Arriba County is guided by the Rio Arriba County Comprehensive Plan and its subdivision regulations.

The Rio Arriba Comprehensive Plan (CommunityByDesign, 2009) focuses on water issues in the County and sets forth a number of goals relating to water use and strategies to meet those goals. The major priorities set forth in the Plan are to keep water within the County to foster long-standing agricultural traditions, sustain the acequia system, and provide safe and adequate drinking water into the future. The Plan sets forth a number of strategies to meet the County's goal of protecting, maintaining, and strengthening the relationship between land and water. These strategies include acquiring water rights at risk of loss and placing them to beneficial use, encouraging the adjudication of water rights of all acequias in the County to include historical uses, customs and practices, encouraging acequias to adopt bylaws governing the transfer of acequia rights, encouraging acequias and mutual domestic providers to work with the County, the NMOSE, and tribal governments to establish conservation and restoration programs, and mapping and inventorying water resources in the County. The Plan also sets as a goal the protection of the County's water supply and quality, and to do so, encourages water conservation measures as well as community water and wastewater systems.

The County's Subdivision Regulations require that a subdivider show that sufficient water is available to fulfill the maximum water requirements of the subdivision and provide a water supply plan including conservation, water quality, and fire protection components. Art. VII, §2 and Appendix A. For all subdivisions containing 20 or more parcels, any one of which is 2 acres or less in size, the subdivider must provide a State Engineer permit allowing subdivision water use.

4.2 Relevant Environmental Law

4.2.1 Species Protection Laws

4.2.1.1 Federal Endangered Species Act

The Endangered Species Act (ESA) can have a tremendous influence on the allocation of water, especially of stream and river flows. 16 U.S. C. §§ 1531 to 1544. The ESA was enacted in 1973 and, with limited exceptions, has remained in its current form since then. The goal of the Act is to protect threatened and endangered species and the habitat on which they depend. 16 U.S.C. § 1531(b). The Act's ultimate goal is to "recover" species so that they no longer need protection under the Act.

The ESA provides several mechanisms for accomplishing these goals. It authorizes the U.S. Fish and Wildlife Service (USFWS) to list "threatened" or "endangered" species, which are then protected under the Act, and to designate "critical habitat" for those species. The Act makes it unlawful for anyone to "take" a listed species unless an "incidental take" permit or statement is first obtained from the Department of the Interior. 16 U.S.C. §§ 1538, 1539. To "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19).

In addition, federal agencies must use their authority to conserve listed species. 16 U.S.C. § 1536(a)(1). They must make sure, in consultation with USFWS, that their actions do not jeopardize the continued existence of listed species or destroy or harm habitat that has been designated as critical for such species. 16 U.S.C. § 1536(a)(2). This requirement applies whenever a private or public entity undertakes an action that is "authorized, funded, or carried out," wholly or in part by a federal agency. *Id.* As part of the consultation process, federal agencies must usually prepare a biological assessment to identify endangered or threatened species and determine the likely effect of the federal action on those species and their critical habitat 16 U.S.C. § 1536(c). At the end of the consultation process, the USFWS prepares a biological opinion stating whether the proposed action will jeopardize the species or destroy or adversely modify its critical habitat. 16 U.S.C. § 1536(c)(4). USFWS may also recommend reasonable alternatives that do not jeopardize the species. *Id.*

The 2008 RWP addressed endangered species in depth, in Section 4.3.1 and Appendix D, Section D.2.6.2. Below are some of the species in the planning region that are subject to protection under the ESA:

- Jemez Mountains salamander (endangered): Rio Arriba County
- Southwestern willow flycatcher (endangered; final recovery plan): Taos and Rio Arriba counties
- Yellow-billed cuckoo (threatened) : Taos and Rio Arriba counties
- Mexican spotted owl (threatened; implementation of final recovery plan): Taos and Rio Arriba counties
- Least tern (endangered; recovery plan): Taos and Rio Arriba counties
- Meadow jumping mouse (endangered): Taos and Rio Arriba counties

Of the threatened and endangered species found in the Taos region, the protection and recovery of the yellow-billed cuckoo, southwestern willow flycatcher and New Mexico meadow jumping mouse are most likely to affect water planning within the region because all rely on riparian habitat. Any actions that are likely to harm the habitat used by this species will be subject to strict review and possible limitation.

4.2.1.2 New Mexico Wildlife Conservation Act

The New Mexico Wildlife Conservation Act, enacted in 1974, provides for the listing and protection of threatened and endangered wildlife species in the state. NMSA 1978, §§ 17-2-37 to 17-2-46. In enacting the law, the Legislature found that indigenous New Mexico species that are threatened or endangered "should be managed to maintain and, to the extent possible, enhance their numbers within the carrying capacity of the habitat." Section 17-2-39(A).

The Act authorizes the New Mexico Department of Game and Fish to conduct investigations of indigenous New Mexico wildlife species suspected of being threatened or endangered to determine if they should be listed. Section 17-2-40(A). Based on the investigation, the director then makes listing recommendations to the Game and Fish Commission. *Id.* The Act authorizes the Commission to issue regulations listing wildlife species as threatened or endangered based on the investigation and recommendations of the Department. Section 17-2-41(A). Once a species is listed, the Department of Game and Fish, "to the extent practicable," is to develop a recovery plan for that species. Section 17-2-40.1. The Act makes it illegal to "take, possess, transport, export, process, sell or offer for sale[,] or ship" any listed endangered wildlife species. Section 17-2-41(C). However, enforcement of this provision of the Act is very limited.

Pursuant to the Act, the Commission has listed over 100 wildlife species—mammals, birds, fish, reptiles, amphibians, crustaceans, and mollusks—as endangered or threatened. 19.33.6.8 NMAC.

As of August 2014, 62 species were listed as threatened, and 56 species were listed as endangered. *Id.* In the Taos planning region, all of the federally listed species discussed above are protected also under the New Mexico Act.

4.2.2 Water Quality Laws

4.2.2.1 Federal Clean Water Act

The most significant federal law addressing water quality is the Clean Water Act (CWA), 33 U.S.C. §§ 1251 to 1387, which Congress enacted in its modern form in 1972, overriding President Nixon's veto. The stated objective of the CWA is to "restore and maintain the chemical, physical and biological integrity" of the waters of the United States. 33 U.S.C. § 1251(a).

4.2.2.1.1 NPDES Permit Program (Section 402)

The CWA makes it unlawful for any person to discharge any pollutant into waters of the United States without a permit. 33 U.S.C. § 1311(a). Generally, a "water of the United States" is a navigable water, a tributary to a navigable water, or an adjacent wetland, although the scope of the term has been the subject of considerable controversy as described below.

The heart of the CWA regulatory regime is the National Pollutant Discharge Elimination System (NPDES) permitting program under Section 402 of the Act. Any person—including a corporation, partnership, state, municipality, or other entity—that discharges a pollutant into waters of the United States from a point source must obtain an NPDES permit from EPA or a delegated state. 33 U.S.C. § 1342. A point source is defined as "any discernible, confined, and discrete conveyance," such as a pipe, ditch, or conduit. *Id*. § 1362(14). NPDES permits include conditions setting effluent limitations based on available technology and, if needed, effluent limitations based on water quality.

The CWA provides that each NPDES permit issued for a point source must impose effluent limitations based on application of the best practicable, and in some cases the best available, pollution control technology. 33 U.S.C. § 1311(b). The Act also requires more stringent effluent limitations for newly constructed point sources, called new source performance standards. *Id*. § 1316(b). EPA has promulgated technology-based effluent limitations for dozens of categories of new and existing industrial point source dischargers. 40 C.F.R. pts. 405-471. These regulations set limits on the amount of specific pollutants that a permittee may discharge from a point source.

The CWA requires the states to develop water quality standards for individual segments of surface waters. 33 U.S.C. § 1313. Water quality standards have three components. First, states must specify designated uses for each body of water, such as public recreation, wildlife habitat, water supply, fish propagation, or agriculture. 40 C.F.R. § 131.10. Second, they must establish

water quality criteria for each body of water, which set a limit on the level of various pollutants that may be present without impairing the designated use of the water body. *Id.* § 131.11. And third, states must adopt an antidegradation policy designed to prevent the water body from becoming impaired such that it cannot sustain its designated use. *Id.* § 131.12.

Surface water segments that do not meet the water quality criteria for the designated uses must be listed as "impaired waters." 33 U.S.C. § 1313(d)(l)(C). For each impaired water segment, states must establish "total maximum daily loads" (TMDLs) for those pollutants causing the water to be impaired, allowing a margin of safety. *Id*. § 1313(d)(1). The states must submit to EPA for approval the list of impaired waters and associated TMDLs. *Id*. § 1313(d)(2). The TMDL process, in effect, establishes a basin-wide budget for pollutant influx to a surface water. The states must then develop a continuing planning process to attain the standards, including effluent limitations for individual point sources. *Id*. § 1313(e).

New Mexico has taken steps to implement these CWA requirements. As discussed in Section 4.2.2.3, the New Mexico Water Quality Control Commission has adopted water quality standards for surface waters. The standards include designated uses for specific bodies of water, water quality criteria, and an antidegradation policy. 20.6.4 NMAC. The New Mexico Environment Department (NMED) has prepared a report listing impaired surface waters throughout the state. *State of New Mexico Clean Water Act Section 303(d)/Section 305(b) Integrated Report – 2014-2016* (Nov. 18, 2014). In the Taos planning region, numerous segments of the Upper Rio Grande and Rio Castillo are on the impaired list.

EPA can delegate the administration of the NPDES program to individual states. 33 U.S.C. § 1251(b). New Mexico is one of only a handful of states that has neither sought nor received delegation to administer the NPDES permit program. Accordingly, EPA administers the NPDES program in New Mexico.

4.2.2.1.2 Dredge and Fill Permit Program (Section 404)

The CWA establishes a second important permitting program under Section 404, regulating discharges of "dredged or fill material" into waters of the United States. 33 U.S.C. § 1344. Although the permit requirement applies to discharges of such material into all waters of the United States, most permits are issued for the filling of wetlands. The program is administered primarily by the Army Corps of Engineers, although EPA has the authority to veto permits, and it shares enforcement authority with the Corps.

Like the section 402 NPDES permit program, the CWA allows the section 404 permit program to be delegated to states. 33 U.S.C. § 1344(g). Again, New Mexico has not received such delegation, and the program is implemented in New Mexico by the Corps and EPA.

4.2.2.1.3 Waters of the United States

The term "waters of the United States" delineates the scope of CWA jurisdiction, both for the Section 402 NPDES permit program, and for the Section 404 dredge and fill permit program. The term is not defined in the CWA, but is derived from the definition of "navigable waters," which means "waters of the United States including the territorial seas." 33 U.S.C. § 1362(7). In 1979, EPA promulgated regulations defining the term "waters of the United States." *See* 40 C.F.R. § 230.3(s) (2014) (between 1979 and 2014, the term remained substantially the same). This definition, interpreted and implemented by both EPA and the Corps, remained settled for many years.

In 2001, however, the Supreme Court began to cast doubt on the validity of the definition as interpreted by EPA and the Corps. The Court took up a case in which the Corps had asserted CWA jurisdiction over an isolated wetland used by migratory birds, applying the Migratory Bird Rule. The Court ruled that the Corps had no jurisdiction under the CWA, emphasizing that the CWA refers to "navigable waters," and that the isolated wetland had no nexus to any navigable-in-fact water. *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers,* 531 U.S.159 (2001).

The Court muddied the waters further in its 2006 decision in *Rapanos v. United States,* 547 U.S. 715 (2006) (consolidated with *Carabell v. U.S. Army Corps of Engineers*). Both these cases challenged the Corps' assertion of CWA jurisdiction over wetlands separated from traditional navigable waters by a man-made ditch. In a fractured 4-1-4 decision, the Court ruled that the Corps did not have CWA authority to regulate these wetlands. The plurality opinion, authored by Justice Scalia, held that CWA jurisdiction extends only to relatively permanent standing or flowing bodies of water that constitute rivers, streams, oceans, and lakes. *Id.* at 739. Nevertheless, jurisdiction extends to streams or lakes that occasionally dry up, and to streams that flow only seasonally. *Id.* at 732, n.3. And jurisdiction extends to wetlands with a continuous surface connection to such water bodies. *Id.* at 742. The concurring opinion, written by Justice Kennedy, stated that CWA jurisdiction extends to waters having a "significant nexus" to a navigable water, but the Corps had failed to show such nexus in either case. *Id.* at 779-80. In dissent, Justice Stevens would have found CWA jurisdiction in both cases. *Id.* at 787.

There has been considerable confusion over the proper application of these opinions. Based on this confusion, EPA and the Corps recently amended the regulatory definition of "waters of the United States" to conform to the *Northern Cook County* and *Rapanos* decisions. Final Rule, 80 Fed. Reg. 37054 (June 29, 2015) codified at 33 C.F.R. pt 328; 40 C.F.R. pts 110, 112, 116, 117, 122, 230, 232, 300, 302, and 401. The new definition covers (1) waters used for interstate or foreign commerce, (2) interstate waters, (3) the territorial seas, (4) impounded waters otherwise meeting the definition, (5) tributaries of the foregoing waters, (6) waters, including wetlands, adjacent to the foregoing waters, (7) certain specified wetlands having a significant nexus to the

foregoing waters, and (8) waters in the 100-year floodplain of the foregoing waters. 40 C.F.R. § 302.3.

Several states and industry groups have challenged the new definition in federal district courts and courts of appeal. In one such challenge, the district court granted a preliminary injunction temporarily staying the rule. *North Dakota v. EPA*, 127 F. Supp. 3d 1047 (D.N.D. 2015). Because the NMED and the NMOSE are plaintiffs in this case, the stay is effective—and the new definition does not now apply—in New Mexico. The United States has filed a motion asking the district court to dissolve the injunction and dismiss the case. This case is likely to be appealed.

4.2.2.2 Federal Safe Drinking Water Act

Enacted in 1974, the Safe Drinking Water Act (SDWA) regulates the provision of drinking water in the United States. 42 U.S.C. §§ 300f to 300j-26. The act's overriding purpose is "to insure the quality of publicly supplied water." *Arco Oil & Gas Co. v. EPA*, 14 F.3d 1431, 1436 (10th Cir. 1993). The SDWA requires EPA to promulgate national primary drinking water standards for protection of public health and national secondary drinking water standards for protection of public welfare. *Id.*§ 300g-1. To provide this protection, the SDWA requires EPA, as part of the national primary drinking water regulations, to establish maximum contaminant level goals (MCLGs) and maximum contaminant levels (MCLs) for drinking water contaminants. *Id*. § 300g-1(b)(1). The regulations apply to all "public water systems." *Id*. § 300g.

EPA has promulgated primary and secondary drinking water regulations. 40 C.F.R. pts. 141, 143. Most significantly, the agency has set MCLGs and MCLs for a number of drinking water contaminants, including 16 inorganic chemicals, 53 organic chemicals, turbidity, 6 microorganisms, 7 disinfectants and disinfection byproducts, and 4 radionuclides. *Id*. §§ 141.11, 141.13, 141.61-66. As noted above, New Mexico has incorporated these primary and secondary regulations into the state regulations. 20.7.10.100 NMAC, 20.7.10.101 NMAC.

4.2.2.3 Federal Comprehensive Environmental Response, Compensation, and Liability Act

Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or the "Superfund" law, in 1980 to address the burgeoning problem of uncontrolled hazardous waste sites. 42 U.S.C. §§ 9601 to 9675. CERCLA authorizes EPA to prioritize hazardous waste sites according to the degree of threat they pose to human health and the environment, including surface water and groundwater. EPA places the most serious sites on the National Priorities List (NPL). *Id*. § 9605. Sites on the NPL are eligible for federal funds for long-term remediation, which most often includes groundwater remediation.

4.2.2.4 New Mexico Water Quality Act

The most important New Mexico law addressing water quality is the New Mexico Water Quality Act (WQA), NMSA 1978, §§ 74-6-1 to 74-6-17. The New Mexico Legislature enacted the

WQA in 1967. The purpose of the WQA is "to abate and prevent water pollution." *Bokum Res. Corp. v. N.M. Water Quality Control Comm'n*, 93 N.M. 546, 555, 603 P.2d 285, 294 (1979).

The WQA created the Water Quality Control Commission to implement many of its provisions. NMSA 1978, § 74-6-3. The WQA authorizes the Commission to adopt state water quality standards for surface and ground waters and to adopt regulations to prevent or abate water pollution. NMSA 1978, § 74-6-4(C) and (D). The WQA also authorizes the Commission to adopt regulations requiring persons to obtain from the NMED a permit for the discharge into groundwater of any water contaminant. Section 74-6-5(A). The Department must deny a discharge permit if the discharge would cause or contribute to contaminant levels in excess of water quality standards "at any place of withdrawal of water for present or reasonably foreseeable future use." Section 74-6-5(E)(3). The WQA also authorizes the Commission to adopt regulations relating to monitoring and sampling, record keeping, and Department notification regarding the permit. Section 74-6-5(I). Permit terms are generally limited to five years. Section 74-6-5(H).

Accordingly, the Commission has adopted groundwater quality standards, regulations requiring discharge permits, and regulations requiring abatement of groundwater contamination. 20.6.2 NMAC. The water quality standards for groundwater are published at Sections 20.6.2.3100 through 3114 NMAC, and the regulations for discharge permits are published at Sections 20.6.2.3101 to 3114 NMAC.

An important part of these regulations are those addressing abatement. 20.6.2.4101 - .4115 NMAC. The purpose of the abatement regulations is to "[a]bate pollution of subsurface water so that all groundwater of the State of New Mexico which has a background concentration of 10,000 milligrams per liter or less total dissolved solids is either remediated or protected for use as domestic or agricultural water supply." 20.6.2.4101.A(1) NMAC. The regulations require that groundwater pollution must be abated to conform to the water quality standards. 20.6.2.4103.B NMAC. Abatement must be conducted pursuant to an abatement plan approved by the Department, 20.6.2.4104.A NMAC, or pursuant to a discharge permit, 20.6.2.3109.E NMAC.

In addition, the Commission has adopted standards for surface water. 20.6.1 NMAC. The objective of these standards, consistent with the federal Clean Water Act (Section 4.2.2.1) is "to establish water quality standards that consist of the designated use or uses of surface waters of the [S]tate, the water quality criteria necessary to protect the use or uses[,] and an antidegradation policy." 20.6.4.6.A NMAC. The standards include designated uses for specific bodies of water within the state, 20.6.4.50 to 20.6.4.806 NMAC; general water quality criteria, 20.6.4.13 NMAC; water quality criteria for specific designated uses, 20.6.4.900 NMAC; and water quality criteria for specific bodies of water, 20.6.4.50 to 20.6.4.806 NMAC. The standards also include an antidegradation policy, applicable to all surface waters of the state, to protect and maintain water quality. 20.6.4.8 NMAC. The antidegradation policy sets three levels of protection, closely matched to the federal regulations.

Lastly, the Commission has also adopted regulations limiting the discharge of pollutants into surface waters. 20.6.2.2100 to 2202 NMAC.

4.1.1.5 New Mexico Drinking Water Standards

The New Mexico Environmental Improvement Act created an Environmental Improvement Board, and it authorizes the Board to promulgate rules and standards for water supply. NMSA 1978, § 74-1-8(A)(2). The Board has accordingly adopted state drinking water standards for all public water systems. 20.7.10 NMAC. The state regulations incorporate by reference the federal primary and secondary drinking water standards, 40 C.F.R. parts 141 and 143, established by the EPA under the Safe Drinking Water Act (Section 4.2.2.2). 20.7.10.100 NMAC, 20.7.10.101 NMAC.

4.1.1.6 Tribal Law

Both Taos and Picuris Pueblos have adopted water quality standards under the federal Clean Water Act and monitor water quality on a regular basis.

4.3 Legal Issues Unique to the Region and Local Conflicts Needing Resolution

One local conflict needing resolution is a determination how to best implement the Abeyta Water Rights Adjudication Settlement Agreement between the United States of America, as trustee for the Pueblo of Taos; the Pueblo of Taos, on its own behalf; the State of New Mexico; the Taos Valley Acequia Association, on its own behalf and 54 of its 55 member acequias on their own behalves; the Town of Taos; the El Prado Water and Sanitation District; and the 12 Taos Area Mutual Domestic Water Consumers' Associations, on their own behalves and on behalf of their members. Implementation of this agreement is crucial to water planning in the region.

Further, the Top of the World water rights transfer, the effort by Santa Fe County to transfer water rights located in Taos County downstream to meet water requirements of the Aamodt Settlement, has been protested and will be the subject of administrative and, potentially, judicial proceedings. The outcome of these proceedings will also impact water planning in the region.

Other key issues including conflicts in the region identified by the region are summarized in Section 5.

5. Water Supply

This section provides an overview of the water supply in the Taos Water Planning Region, including climate conditions (Section 5.1), surface water and groundwater resources (Sections 5.2 and 5.3), water quality (Section 5.4), and the administrative water supply used for planning purposes in this regional water plan update (Section 5.5). Additional quantitative assessment of water supplies is included in Section 7, Identified Gaps between Supply and Demand.

The Handbook specifies that each of the 16 regional water plans briefly summarize water supply information from the previously accepted plan and provide key new or revised information that has become available since submittal of the accepted regional water plan. The information in this section regarding surface and groundwater supply and water quality is thus drawn largely from the accepted *Taos Regional Water Plan* (DBS&A, 2008) and, where appropriate, updated with more recent information and data from a number of sources, as referenced throughout this section.

Currently some of the key water supply updates and issues impacting the Taos region are:

- For the climate division that spans the planning region, 2011, 2012, and 2013 were all severe to extreme drought years (NCDC, 2014), and the winter snowpack for 2014 was also very low. This is a particular concern for water users that are dependent on surface water supplies, but drought preparedness (developing drought contingency plans and shortage sharing agreements) is important for each community and acequia in the region.

- More than 300 acequias are present in the region, and the pueblos have practiced agriculture in the region for centuries. During the original planning effort, the steering committee recognized that individual pueblos, acequias, and parciantes have the authority to make decisions regarding potential transfers, but to protect the region overall, the steering committee supported efforts to preserve a continuing viable agricultural sector in the region. Agricultural economic viability is still a key issue in the region.

- Due to the large amount of forested land in the region, coupled with the recent drought conditions, the threat of wildfire and subsequent sedimentation impacts on streams and reservoirs remains a key planning issue. Continued and expanded efforts to reduce catastrophic fire risk through forest management, as well as additional information on the quantitative benefits of various management techniques, are needed. In particular, quantification of the effectiveness of riparian vegetation removal, upland conifer thinning, and other water salvage methods needs further study to support well-informed decisions.

- The Nature Conservancy is working to develop the Rio Grande Water Fund, which if funded, will generate sustainable income for a 10- to 30-year forest restoration program through a multi-party effort. Models of debris flow risk after high-severity fire indicate that key water sources are at risk, and the goal of the program is to reduce the risk of catastrophic wildfire and subsequent sedimentation and localized water quality degradation to protect the region's water supply. Details of the program plan are included in the *Rio Grande Fund, Comprehensive Plan for Wildfire and Water Source Protection* (Nature Conservancy, 2015).

- Climate change will likely result in more severe drought conditions and associated wildfires, interspersed with more extreme precipitation events. In addition, climate change is predicted to result in less availability of water and impacts to water quality in the long-term. Efforts to increase the resilience of the Taos region watersheds will help to mitigate the impacts of climate change on the region's water supply and water quality.

- The Rio Grande is the main river in the planning region. The groundwater in the region is within the Rio Grande UWB and is considered to be stream-connected. The Rio Grande is fully appropriated; therefore, any new diversion of surface water or groundwater requires the transfer of a valid water right or application for a new domestic or livestock well. The availability of water rights may thus be a limiting factor in meeting the future water needs of the region.

- The Village of Questa does not have adequate water rights to support its current and future needs and is actively seeking additional water rights. The Village also has infrastructure maintenance and upgrade needs.

- The Town of Red River has a good groundwater supply and pumping capacity, but needs a new storage tank and water and wastewater system upgrades. A wastewater PER was prepared in July 2014, and a water system PER is currently being prepared.

- The Taos Pueblo Indian Water Rights Settlement Act was passed and signed into law by President Obama in 2010 (USA et al., 2012). The purpose the Act was to approve and ratify the Taos Pueblo Indian Water Rights Settlement Agreement (also referred to informally as the Abeyta Settlement, after the first party on an alphabetical list of parties to the Settlement). One of the key hydrologic features of the settlement is to prevent future groundwater development in the shallow aquifer in the Taos Valley, by moving development to deeper wells, thereby avoiding impacts to some tributary streams and acequia systems. Providing for adequate treatment to address water quality issues in the deep wells will be an important part of Settlement implementation, and funding for maintenance of the deep wells is also an ongoing concern.

- Under the Taos Pueblo Indian Water Rights Settlement, impacts to the Taos Valley tributaries from groundwater pumping must be offset through use of mainstem Rio Grande water rights (San Juan-Chama water on the Rio Grande will be used for the majority of the offsets) or through a series of mitigation wells that pump and release water based on pumping effects as determined by the Settlement Groundwater Model. Appendix 3 of the Settlement Agreement provides a detailed description of offset calculations and requirements.

- The Town of Taos is currently developing plans for new infrastructure for replacement of some wells under the terms of the Taos Pueblo Indian Water Rights Settlement and is working on water system improvements upgrades including metering, addressing well

production issues, reducing leaks, and providing a source of emergency supply to Talpa and El Valle de Los Ranchos.

- The parties to the Taos Pueblo Indian Water Rights Settlement include 12 mutual domestic water associations; these groups are working to address water rights issues and system improvements.
- Taos Pueblo has received funding from the federal government and is beginning to implement some components of the Taos Pueblo Indian Water Rights Settlement Agreement.
- The 54 acequias who are parties to the Taos Pueblo Indian Water Rights Settlement continue to work on system improvements and have been challenged by limited surface supplies due to drought.
- El Prado Water and Sanitation District continues to plan for Taos Pueblo Indian Water Rights Settlement implementation and will cooperate with local users to lease water for construction of the new airport.
- Since the original plan was published, additional hydrogeologic investigations have been completed by the New Mexico Bureau of Geology & Mineral Resources, including hydrogeologic investigations of the northern Taos Plateau (Johnson and Bauer, 2012), and the Questa area (Bauer et al., 2015), and the southern Taos Valley (Johnson and Bauer, in progress). The northern Taos Plateau study area included the basalt-capped plateau on the west side of the Rio Grande and included seven detailed cross sections. Hydrogeologic and water quality data were used to identify groundwater flow patterns and sources of recharge. The Questa area study interpreted the three-dimensional geology and preliminary hydrogeology of the area, and included three detailed geologic cross sections which are useful tools for development of future water supply wells near Questa.
- As part of the Taos Pueblo Indian Water Rights Settlement, a groundwater model (Barroll and Burck, 2006) was collaboratively developed by NMOSE and other parties involved in the Settlement, as described in the 2008 Taos Regional Water Plan. The modeling simulates groundwater flow in about 3,000 feet of alluvial and volcanic deposits and is intended to be used as a tool to evaluate effects of deep pumping that is part of the Settlement. Since 2008, additional modeling work has occurred (Barroll, 2012, including development of a superposition model for water rights administration. The superposition model allows for a more efficient evaluation of the impacts of pumping on stream depletions than the original calibrated model, with comparable but more stable results. The superposition model is also more conservative by preventing underestimation of stream depletions.

- The Taos Soil and Water Conservation District (SWCD) has taken over long term monitoring of groundwater levels in the Sunshine Valley. The long-term record indicates that there have been some slight declines in water levels in recent years, but over the long term water levels are relatively stable and in some cases have been rising (Benson, 2015).

- Upgrades to address aging infrastructure are needed in communities throughout the region, and State funding is needed for repairs. The planning region includes 98 water systems (NMED, 2014c), including many small systems such as mutual domestic water consumer associations (MDWCAs) and mobile home parks. Though the source water for these systems is generally good quality groundwater, the maintenance, upgrades, training, operation, and monitoring that is required to ensure delivery of water that meets drinking water quality standards is a financial and logistical challenge for these small systems. Achieving optimal efficiency in water system operation and infrastructure upgrades, through cooperative associations or other means, was identified as an important objective in the accepted plan and remains important to the region.

- The accepted water plan identified water quality impacts due to mining as an issue of concern. Though molybdenum mining activities in the Red River drainage ceased in the summer of 2014, and possibly for the long-term, there is an ongoing cleanup effort being conducted under the Superfund program. The concentrations of molybdenum, manganese, uranium, and sulfate are approaching and exceeding state water quality standards and federal remediation goals in localized areas of the alluvial aquifer downgradient from the tailing facility (U.S. EPA, 2010). The quality of water within these shallow alluvial aquifer systems and in the Red River is an ongoing challenge for the region. There may also be water quality impacts in the Red River drainage due to natural mineralization.

- The original water plan identified potential contamination of shallow groundwater and domestic wells due to septic tanks as a potential water quality concern. This issue is still of concern, as some areas in the region have no access to wastewater treatment infrastructure and continue to be served by domestic wells and septic tanks.

- Naturally occurring high concentrations of uranium, arsenic, and fluoride have sporadically been detected in groundwater throughout the region.

- The Taos SWCD recently completed a study of uranium in the Rio Ojo Caliente area (Benson and Gervason, 2013). The study indicated that levels of uranium approaching or exceeding drinking water standards in many wells in the area originate from deep-sourced hot springs in northern Rio Arriba County that have been depositing travertine for the past 100,000 years. Solution weathering of the hot springs provides a continuing source of trace minerals.

- Water quality testing conducted by the Taos SWCD indicated that uranium levels in domestic wells in some locations south of Rio Hondo approach or exceed drinking water standards. The elevated uranium is found in alluvial fan deposits. The effects can be mitigated with simple filters for domestic wells or more expensive treatment systems for community wells (Benson et al., 2014).

- Water quality in the deep aquifer will require treatment. Arsenic is a primary concern, though treatment for fluoride, uranium, total dissolved solids, and/or other constituents may also be required. Funding for arsenic treatment is included as part of the federal authorization, covered in the Taos Pueblo Indian Water Rights Settlement Agreement, to develop future water supplies from the deep aquifer. The Taos Pueblo Indian Water Rights Settlement Act was passed and signed into law by President Obama in 2010 (USA et al., 2012).

- The Federal Emergency Management Administration released new flood hazard determinations for Taos County in 2014 (FEMA, 2014). The new maps define hazard areas and indicate flood insurance rate boundaries.

- The Taos Pueblo Indian Water Rights Settlement allows for leasing and transfer of water rights within the limits defined in the Settlement. A mechanism is needed to effectively evaluate the technical and political aspects of water transfers in the region. The region is interested in ensuring that acequias have adequate education and protection to avoid being harmed by future transfers.

5.1 Summary of Climate Conditions

The accepted regional water plan (DBS&A, 2008) included an analysis of historical temperature and precipitation in the region. This section provides an updated summary of temperature, precipitation, snowpack conditions, and drought indices pertinent to the region (Section 5.1.1). Studies relevant to climate change and its potential impacts to water resources in New Mexico and the Taos region are discussed in Section 5.1.2.

5.1.1 Temperature, Precipitation, and Drought Indices

Table 5-1 lists the periods of record for weather stations in the Taos region and identifies two stations, Cerro and Taos, that were used for analysis of weather trends. The Cerro and Taos stations were selected based on location, how well they represented conditions within the region, and completeness of their historical records. In addition to the climate stations, data from four snow course or snowpack telemetry (SNOTEL) stations were used to document snowfall in the Sangre de Cristo Mountains (Table 5-1). The locations of the climate stations for which additional data were analyzed are shown in Figure 5-1.

Table 5-1. Taos Climate Stations

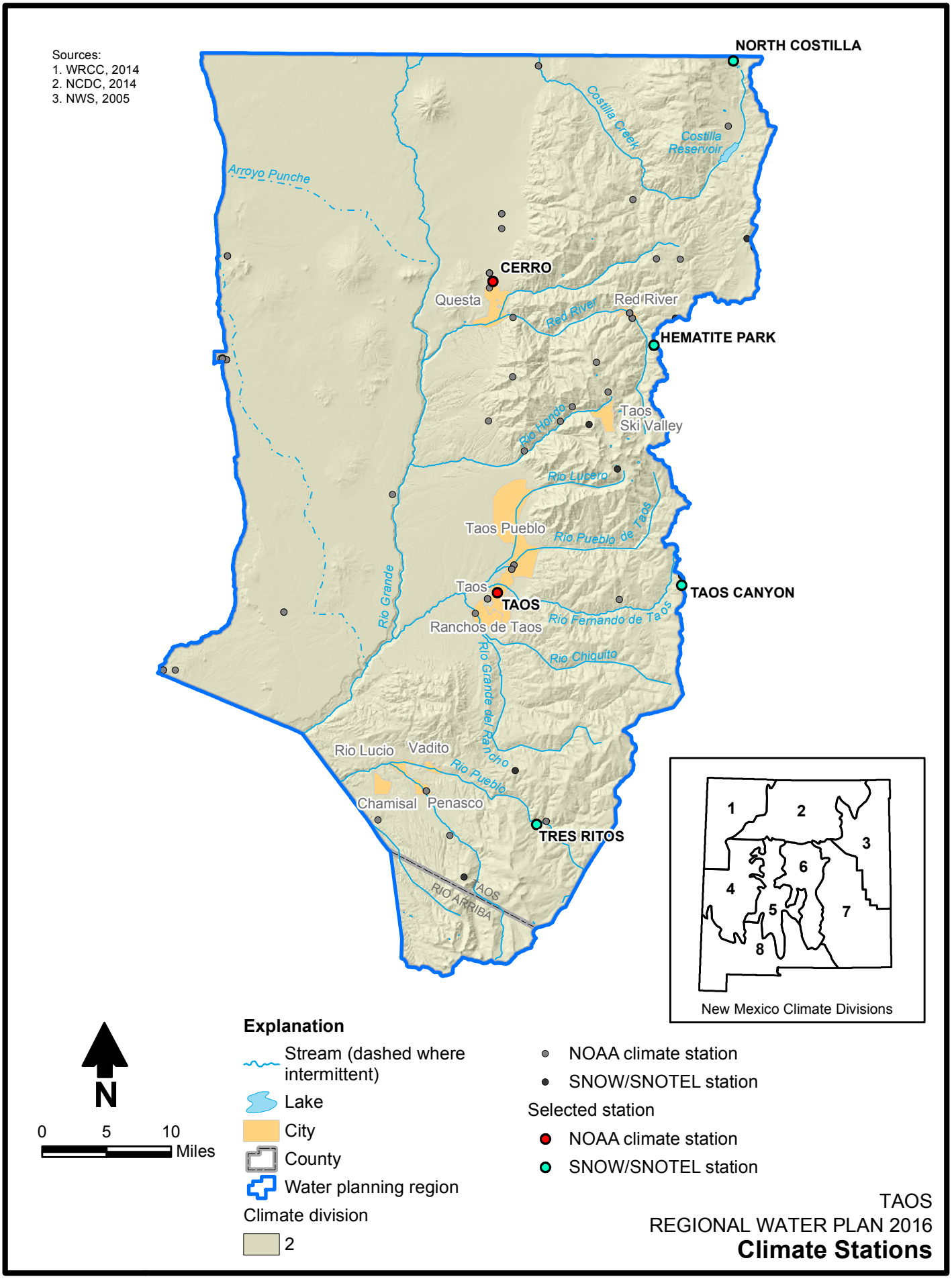
Climate Stations [a]	Latitude	Longitude	Elevation	Precipitation		Temperature	
				Data Start	Data End	Data Start	Data End
Taos County							
Agua Piedra Lodge	36.13	–105.52	8,307	3/1/1967	5/31/1975	—	—
Anchor Mine	36.77	–105.33	10,200	7/1/1911	10/31/1920	8/1/1911	9/30/1911
Cerro	36.74	–105.60	7,650	6/1/1910	Present	6/1/1910	Present
Ojo Caliente	36.30	–106.05	6,296	7/1/1944	3/31/1982	—	—
Penasco Ranger Stn	36.17	–105.68	7,927	7/1/1901	2/28/1976	7/1/1901	8/31/1974
Red River	36.71	–105.40	8,676	6/1/1906	Present	7/1/1906	Present
San Cristobal	36.58	–105.60	8,107	10/1/1947	5/31/1958	9/1/1947	5/31/1958
Servilleta (Near)	36.50	–105.73	7,000	8/1/1920	10/31/1928	—	—
Taos	36.39	–105.59	6,965	12/1/1892	12/31/2009	12/1/1892	2/28/2010
Taos Canyon	36.38	–105.42	8,235	7/1/1909	4/30/1943	—	—
SNOTEL Stations							
Gallegos Peak – SNTL	36.19	–105.56	9,800	6/12/1980	Present	NR	NR
Hematite Park – Snow	36.67	–105.37	9,500	1937	Present	NR	NR
North Costilla – SNTL	36.99	–105.26	10,600	11/6/1978	Present	NR	NR
Palo – SNTL	36.41	–105.33	9,350	8/17/2010	Present	NR	NR
Red River Pass #2 – SNTL	36.70	–105.34	9,850	10/1/1978	Present	NR	NR
Rio Santa Barbara – SNTL	36.07	–105.63	10,664	2013	Present	NR	NR
Shuree – SNTL	36.79	–105.24	10,100	8/19/2010	Present	NR	NR
Taos Canyon – Snow	36.40	–105.33	9,100	1937	Present	NR	NR
Taos Powderhorn – Snow	36.53	–105.42	11,250	1974	Present	NR	NR
Taos Powderhorn – SNTL	36.58	–105.46	11,057	8/16/2010	Present	NR	NR
Tres Ritos – Snow	36.13	–105.53	8,600	1938	Present	NR	NR
Tres Ritos – SNTL	36.13	–105.53	8,600	9/20/2006	Present	NR	NR

Source: WRCC, 2014

— = Information not available

[a] Stations in **bold** type were selected for detailed analysis.

NR = Temperature is not recorded at SNOTEL stations.



TAOS
REGIONAL WATER PLAN 2016
Climate Stations

Figure 5-1

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Long-term minimum, maximum, and average temperatures for the Cerro and Taos climate stations are detailed in Table 5-2, and average summer and winter temperatures for each year of record are shown on Figure 5-2.

The average precipitation distribution across the entire region is shown on Figure 5-3, and Table 5-2 lists the minimum, maximum, and long-term average annual precipitation (rainfall and snowmelt) at the Cerro and Taos stations. The long-term averages do not reflect the considerable variability of precipitation, which creates a direct challenge for water supply planning. The variability in total annual precipitation for the Taos and Cerro climate stations is shown in Figure 5-4 and is also reflected in the snow data and drought indices discussed below. In addition to annual variability, monthly variability in precipitation and resulting streamflow also presents a challenge: snowmelt and/or monsoon flows may not occur at times when water is most needed for agriculture or other uses.

The Natural Resources Conservation Service (NRCS) operates the following snow stations in the planning region (Figure 5-5) (NRCS, 2014a):

- Six SNOTEL stations
- Two snow course stations
- Two stations that collect both snow course and SNOTEL data

These stations provide snow depth and snow water equivalent data. The snow water equivalent is the amount of water, reported in inches, within the snowpack, or the amount of water that would result if the snowpack were instantly melted (NRCS, 2014b). The end of season snowpack is a good indicator of the runoff that will be available to meet water supply needs. A summary of the early April (generally measured within a week of April 1) snow depth and snow water equivalent information at four representative stations (one SNOTEL and three snow course stations) is provided on Figures 5-5a and 5-5b. These figures show that the early April snowpack and snow water equivalent vary greatly, from 0 to more than 30 inches.

Another way to review long-term variations in climate conditions is through drought indices. A drought index consists of a ranking system derived from the assimilation of data—including rainfall, snowpack, streamflow, and other water supply indicators—for a given region. The Palmer Drought Severity Index (PDSI) was created by W.C. Palmer (1965) to measure the variations in the moisture supply and is calculated using precipitation and temperature data as well as the available water content of the soil. Because it provides a standard measure that allows comparisons among different locations and months, the index is widely used to assess the weather during any time period relative to historical conditions. The PDSI classifications for dry to wet periods are provided in Table 5-3.

Table 5-2. Temperature and Precipitation for Selected Climate Stations Taos Water Planning Region

Station Name	Precipitation (inches)				Temperature			
	Average Annual [a]	Minimum [b]	Maximum [b]	% of Possible Observations [c]	Average (°F)			% of Possible Observations [c]
					Annual [d]	Minimum [e]	Maximum [e]	
Cerro	12.73	7.26	19.29	96.3	44.4	28.8	60.0	72.9
Taos	12.35	6.39	22.73	97.6	47.3	31.0	63.6	93.3

Source: Statistics computed by Western Regional Climate Center (2014)

ft amsl = Feet above mean sea level

°F = Degrees Fahrenheit

[a] Average of annual precipitation totals for the period of record at each station.

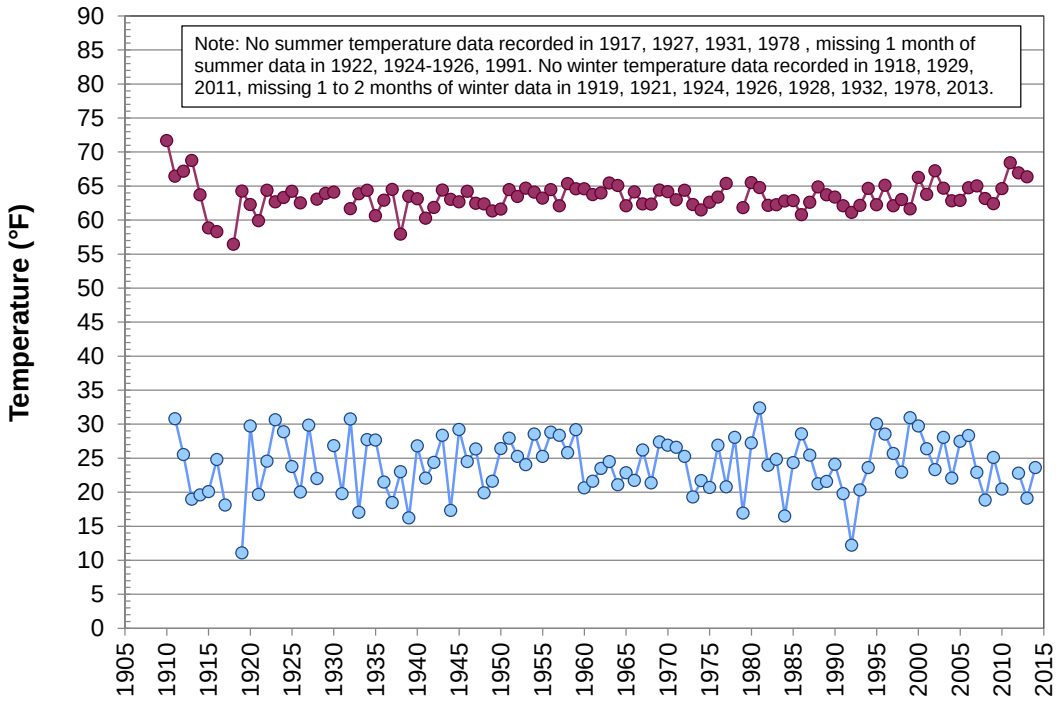
[b] Minimum and maximum recorded annual precipitation amounts for each station.

[c] Amount of completeness in the daily data set that was recorded at each station (e.g., 99% complete means there is a 1% data gap).

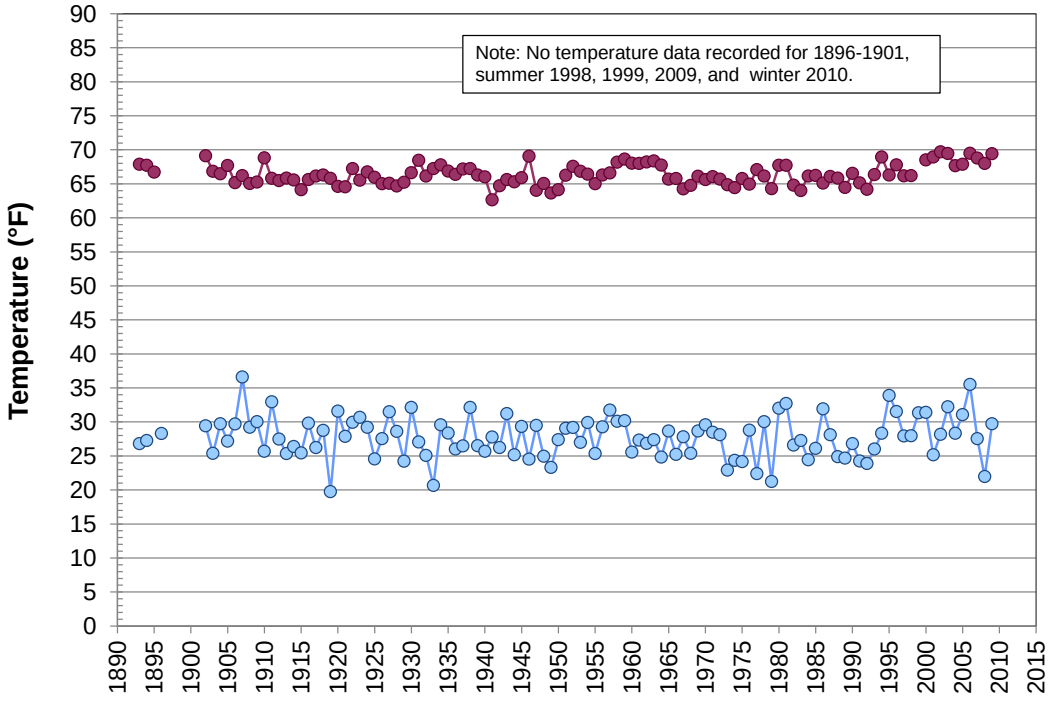
[d] Average of the daily average temperatures calculated for each station.

[e] Average of the daily minimum (or maximum) temperature recorded daily for each station.

Cerro



Taos



TAOS
REGIONAL WATER PLAN 2016

Average Temperature
Cerro and Taos Climate Stations

Figure 5-2

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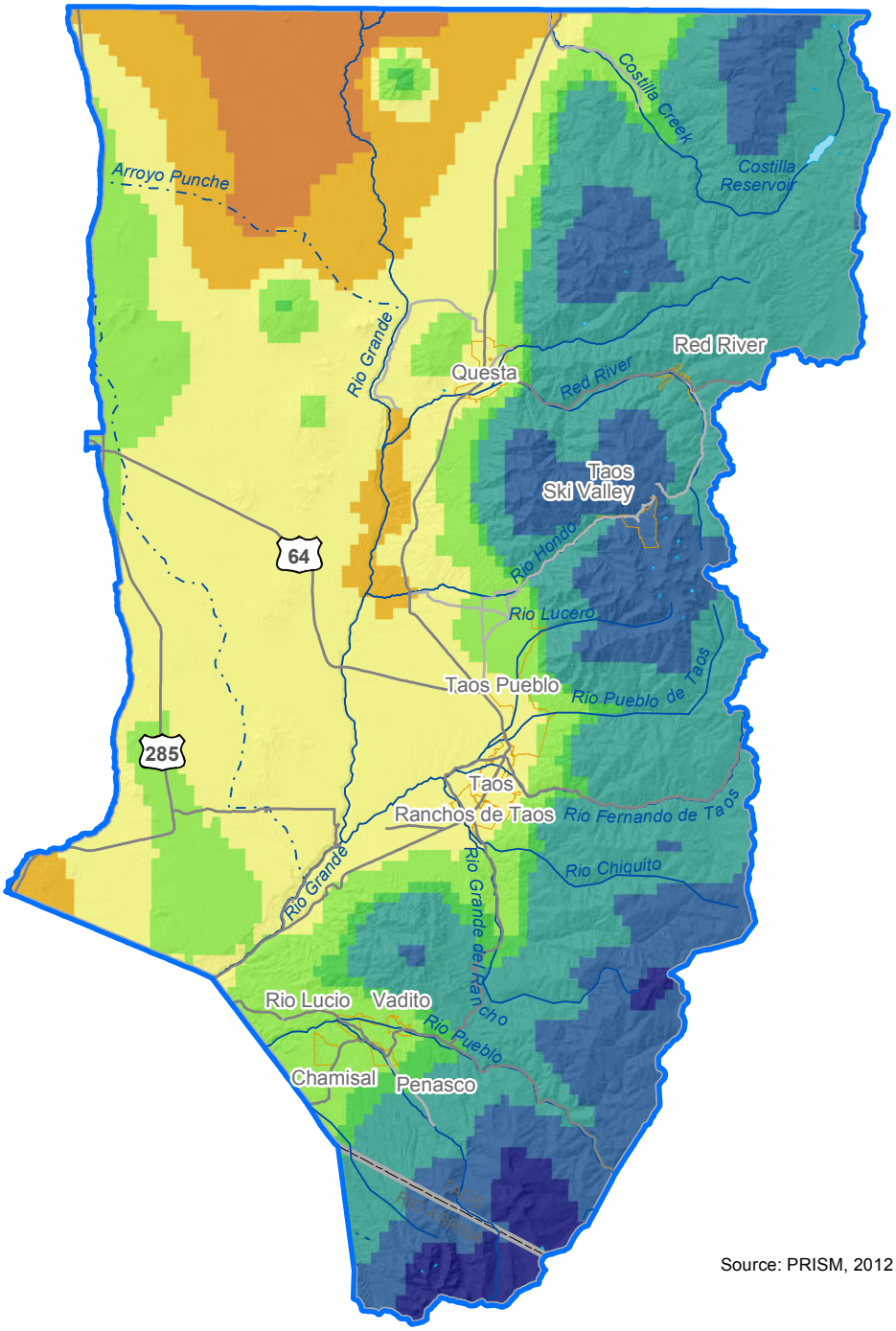

Explanation

- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

Normal annual precipitation (in/yr)

8 - 10	19 - 20
11 - 12	21 - 30
13 - 14	31 - 40
15 - 18	41 - 50

N

0 5 10 Miles

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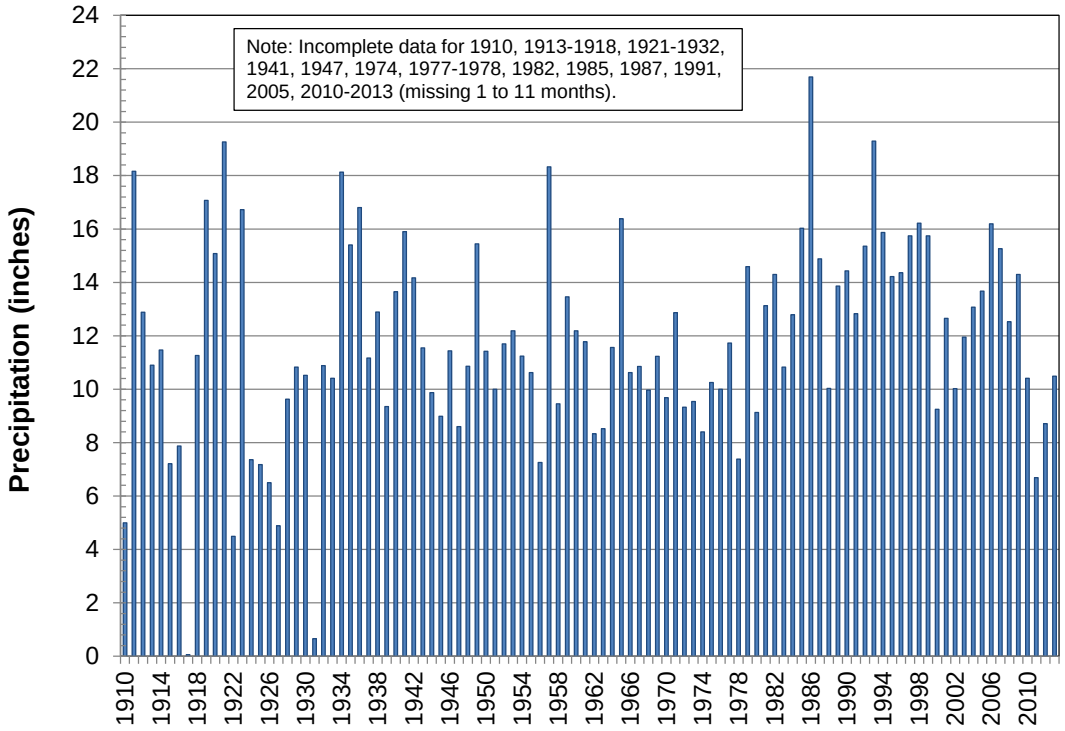
TAOS
REGIONAL WATER PLAN 2016

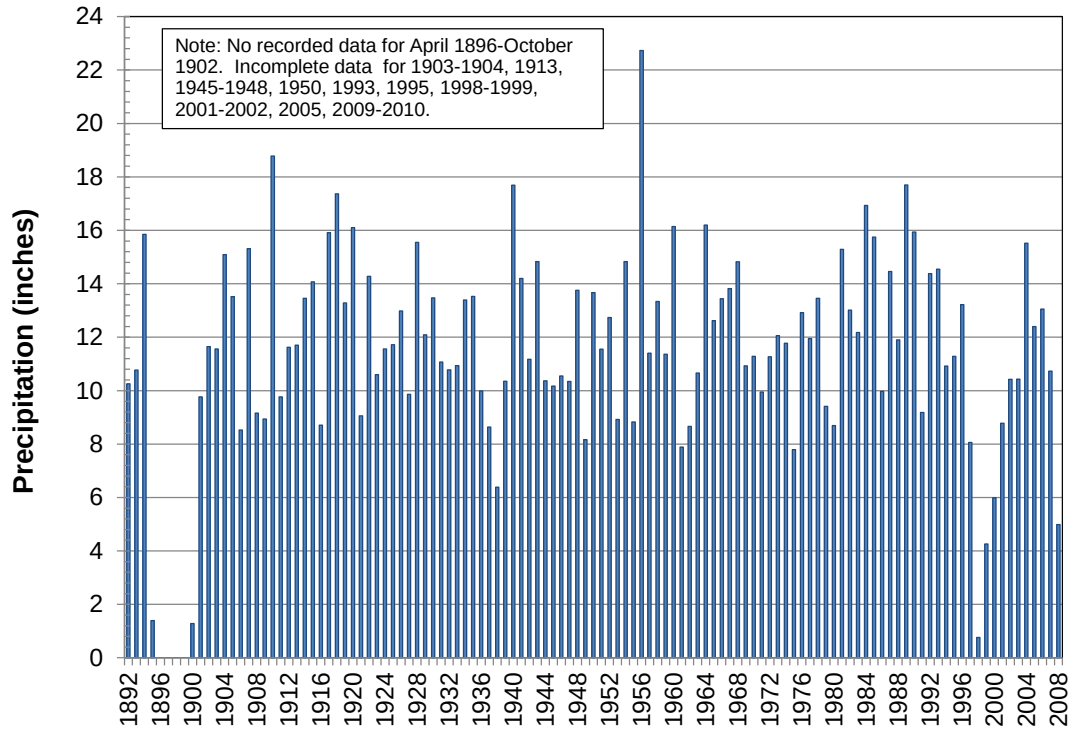
Average Annual Precipitation (1980 to 2010)

Figure 5-3

Cerro



Taos



TAOS
REGIONAL WATER PLAN 2016

Annual Precipitation,
Cerro and Taos Climate Stations

Figure 5-4

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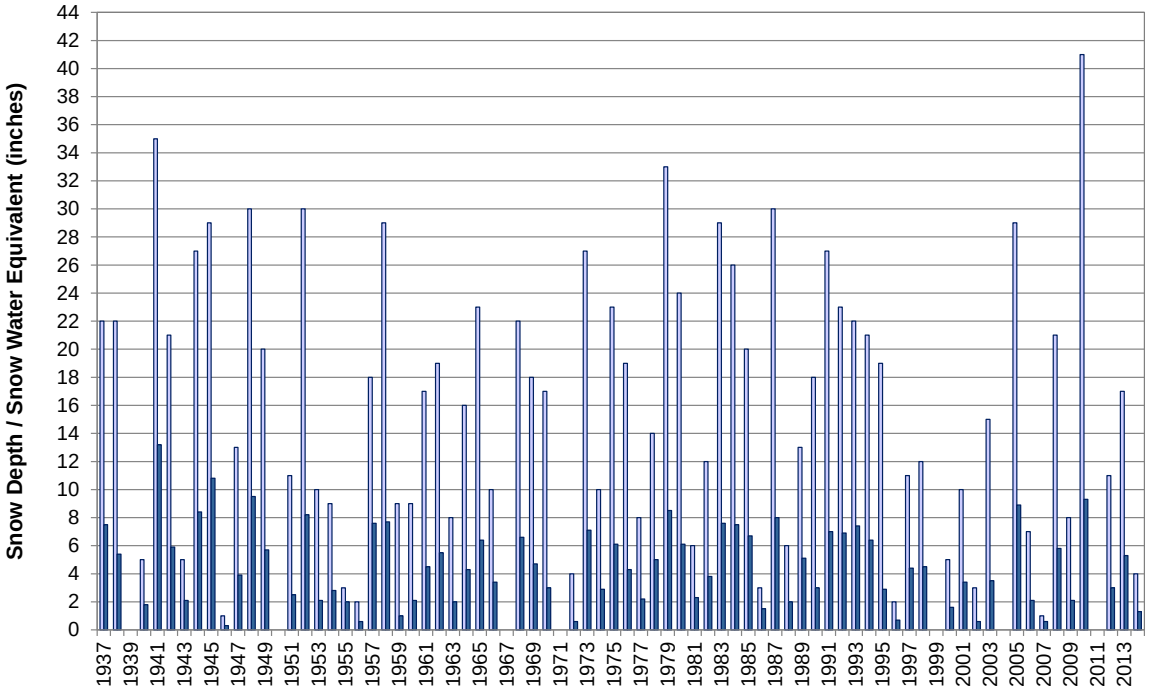
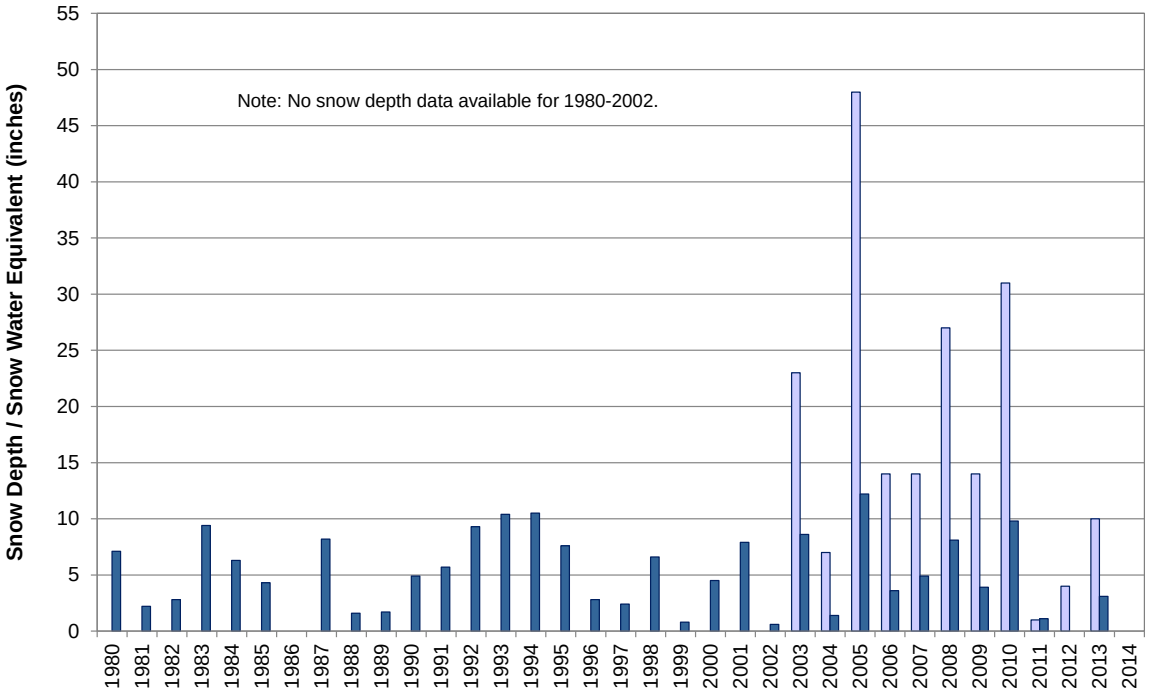
Hematite Park Snow Course with Aerial Marker



North Costilla SNOTEL



Snow depth

Snow water equivalent (the amount of water that would result if the snowpack were instantly melted)

Notes: 1. Measurements made in the last few days of March or first few days of April.
2. Years with no bars visible are years with zero snow depth (unless otherwise noted).

TAOS
REGIONAL WATER PLAN 2016

Snow Depth and Snow Water Equivalent for April

Figure 5-5a

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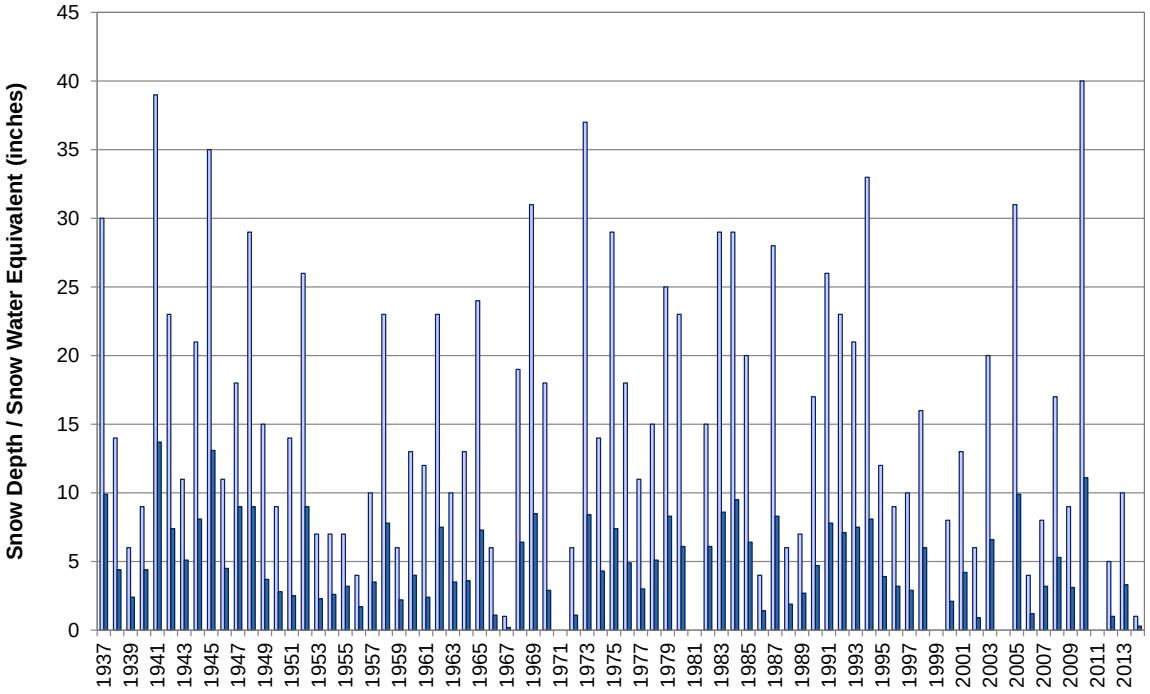
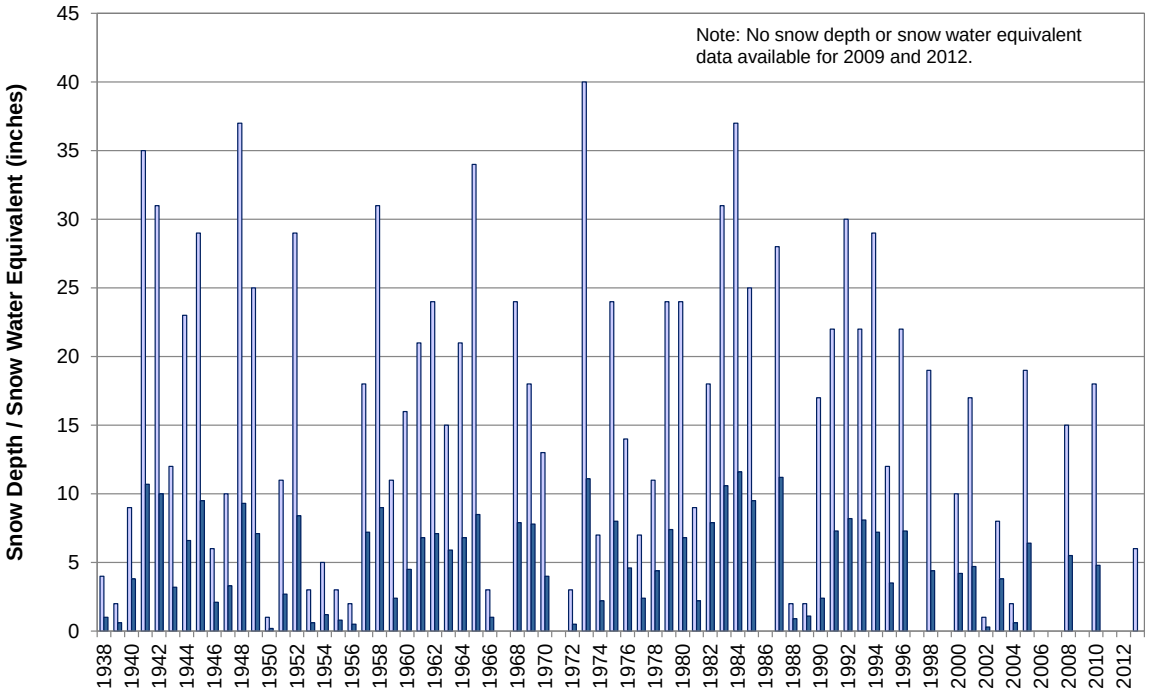
Taos Canyon Snow Course with Aerial Marker



Tres Ritos Snow Course with Aerial Marker



Snow depth

Snow water equivalent (the amount of water that would result if the snowpack were instantly melted)

Notes: 1. Measurements made in the last few days of March or first few days of April.
2. Years with no bars visible are years with zero snow depth (unless otherwise noted).

TAOS
REGIONAL WATER PLAN 2016

Snow Depth and Snow Water Equivalent for April

Figure 5-5b

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Table 5-3. Palmer Drought Severity Index Classifications

PDSI Classification	Description
+ 4.00 or more	Extremely wet
+3.00 to +3.99	Very wet
+2.00 to +2.99	Moderately wet
+1.00 to +1.99	Slightly wet
+0.50 to +0.99	Incipient wet spell
+0.49 to –0.49	Near normal
–0.50 to –0.99	Incipient dry spell
–1.00 to –1.99	Mild drought
–2.00 to –2.99	Moderate drought
–3.00 to –3.99	Severe drought
–4.00 or less	Extreme drought

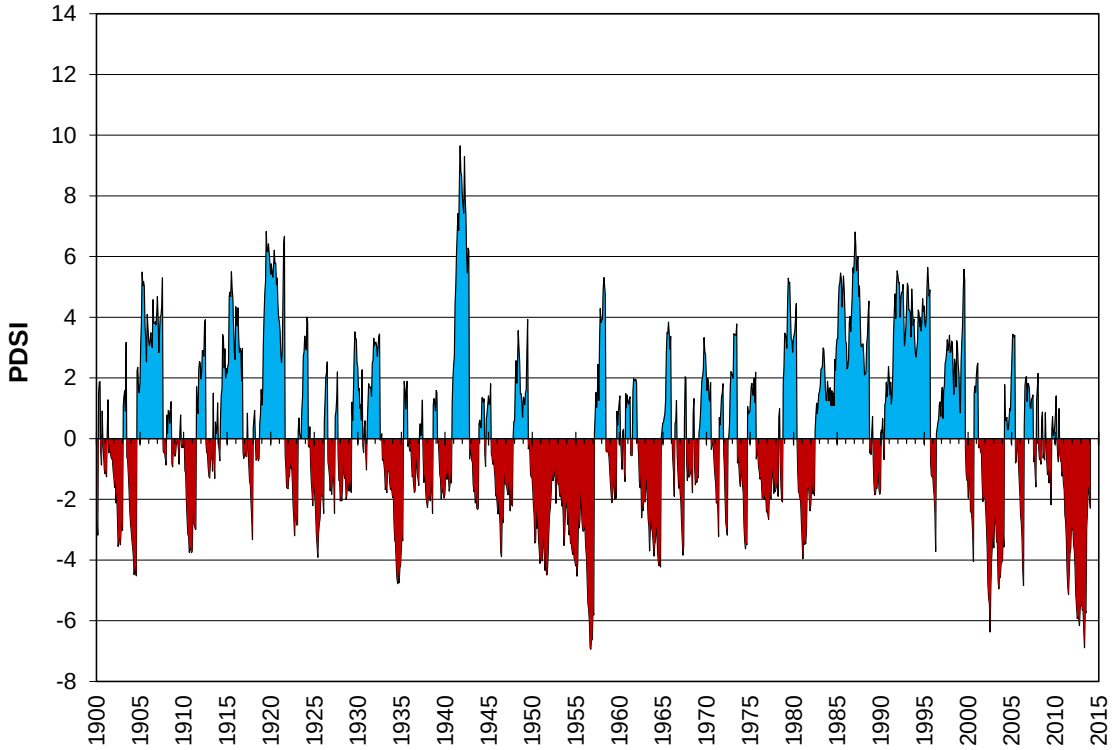
There are considerable limitations when using the PDSI, as it may not describe rainfall and runoff that varies from location to location within a climate division and may also lag in indicating emerging droughts by several months. Also, the PDSI does not consider groundwater or reservoir storage, which can affect the availability of water supplies during drought conditions. However, even with its limitations, many states incorporate the PDSI into their drought monitoring systems, and it provides a good indication of long-term relative variations in drought conditions, as PDSI records are available for more than 100 years.

The PDSI is calculated for climate divisions throughout the United States. The Taos region falls entirely within New Mexico Climate Division 2 (the Northern Mountains Climate Division). Figure 5-6 shows the long-term PDSI for Division 2. Of interest are the large variations from year to year. The chronological history of drought, as illustrated by the PDSI, indicates that the most severe droughts in the last century occurred in the early 1900s, the 1950s, the early 2000s, and in recent years (2011 to 2013) (Figure 5-6). In 2013 the PDSI in Climate Division 2 dipped to its lowest index value in almost 50 years (Figure 5-6).

The likelihood of drought conditions developing in New Mexico is influenced by several weather patterns:

- *El Niño/La Niña:* El Niño and La Niña are characterized by a periodic warming and cooling, respectively, of sea surface temperatures across the central and east-central equatorial Pacific. Years in which El Niño is present are more likely to be wetter than average in New Mexico, and years with La Niña conditions are more likely to be drier than average, particularly during the cool seasons of winter and spring.

Climate Division 2



Note: Blue indicates wetter than average conditions and red indicates drier than average conditions, as described on Table 5-3.

TAOS
REGIONAL WATER PLAN 2016
Palmer Drought Severity Index
New Mexico Climate Division 2

Figure 5-6

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- *The Pacific Decadal Oscillation (PDO):* The PDO is a multi-decadal pattern of climate variability caused by shifting sea surface temperatures between the eastern and western Pacific Ocean that cycle approximately every 20 to 30 years. Warm phases of the PDO (shown as positive numbers on the PDO index) correspond to El Niño-like temperature and precipitation anomalies (i.e., wetter than average), while cool phases of the PDO (shown as negative numbers on the PDO index) correspond to La Niña-like climate patterns (drier than average). It is believed that since 1999 the planning region has been in the cool phase of the PDO.

- *The Atlantic Multidecadal Oscillation (AMO):* The AMO refers to variations in surface temperatures of the Atlantic Ocean which, similarly to the PDO, cycle on a multi-decade frequency. The pairing of a cool phase of the PDO with the warm phase of the AMO is typical of drought in the southwestern United States (McCabe et al., 2004; Stewart, 2009). The AMO has been in a warm phase since 1995. It is possible that the AMO may be shifting to a cool phase but the data are not yet conclusive.

- *The North American Monsoon* is characterized by a shift in wind patterns in summer, which occurs as Mexico and the southwest U.S. warm under intense solar heating. As this happens, the flow reverses from dryland areas to moist ocean areas. Low-level moisture is transported into the region primarily from the Gulf of California and eastern Pacific. Upper-level moisture is transported into the region from the Gulf of Mexico by easterly winds aloft. Once the forests of the Sierra Madre Occidental green up from the initial monsoon rains, evaporation and plant transpiration can add additional moisture to the atmosphere that will then flow into the region. If the Southern Plains of the U.S. are unusually wet and green during the early summer months, that area can also serve as a moisture source. This combination causes a distinct rainy season over large portions of western North America (NWS, 2015).

5.1.2 Recent Climate Studies

New Mexico's climate has historically exhibited a high range of variability. Periods of extended drought, interspersed with relatively short-term, wetter periods, are common. Historical periods of high temperature and low precipitation have resulted in high demands for irrigation water and higher open water evaporation and riparian evapotranspiration. In addition to natural climatic cycles (i.e., El Niño/La Niña, PDO, AMO [Section 5.1.1]) that affect precipitation patterns in the southwestern United States, there has been considerable recent research on potential climate change scenarios and their impact on the Southwest and New Mexico in particular.

The consensus on global climate conditions is represented internationally by the work of the Intergovernmental Panel on Climate Change (IPCC), whose Fifth Assessment Report, released in September 2013, states, "Warming of the climate system is unequivocal, and since the 1950s many of the observed changes are unprecedented over decades to millennia. The atmosphere

and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased" (IPCC, 2013). Atmospheric concentrations of greenhouse gases are rising so quickly that all current climate models project significant warming trends over continental areas in the 21st century.

In the United States, regional assessments conducted by the U.S. Global Change Research Program (USGCRP) have found that temperatures in the southwestern United States have increased and are predicted to continue to increase, and serious water supply challenges are expected. Water supplies are projected to become increasingly scarce, calling for trade-offs among competing uses and potentially leading to conflict (USGCRP, 2009). Most of the major river systems in the southwestern United States are expected to experience reductions in streamflow and other limitations to water availability (Garfin et al., 2013).

Although there is consensus among climate scientists that global temperatures are warming, there is considerable uncertainty regarding the specific spatial and temporal impacts that can be expected. To assess climate trends in New Mexico, the NMOSE and NMISC (2006) conducted a study of observed climate conditions over the past century and found that observed wintertime average temperatures had increased statewide by about 1.5°F since the 1950s. Predictions of annual precipitation are subject to greater uncertainty "given poor representation of the North American monsoon processes in most climate models" (NMOSE/NMISC, 2006).

A number of other studies predict temperature increases in New Mexico from 5° to 10°F by the end of the century (Forest Guild, 2008; Hurd and Coonrod, 2008; USBR, 2011). Predictions of annual precipitation are subject to greater uncertainty, particularly regarding precipitation during the summer monsoon season in the southwestern U.S.

In a study outside of the Taos Region but applicable to the northern Sangre de Cristo mountains, Salgado and Gutzler (2013) reviewed climate change impacts on water availability in the Upper Pecos River Basin area, reviewing data from New Mexico Climate Division 2 and streamflow records from the Pecos gage located north of Pecos. They concluded:

- The timing of snowmelt runoff has exhibited a trend of earlier runoff that coincides with warmer temperatures in spring and early summer (March through June).
- Within the most recent 30-year period, the warmer spring and early summer temperature changes account for a larger percentage of the variability in streamflow than does precipitation. This shift may be an indicator of increased evaporation due to increased snowmelt season temperatures.

Based on these studies, the effects of climate change that are likely to occur in New Mexico and the planning region include (NMOSE/NMISC, 2006):

- Temperature is expected to continue to rise.

- Higher temperatures will result in a longer and warmer growing season, resulting in increased water demand on irrigated lands and increased evapotranspiration from riparian areas, grasslands, and forests, and thus less recharge to aquifers.

- Reservoir and other open water evaporation are expected to increase. Soil evaporation will also increase.

- Precipitation is expected to be more concentrated and intense, leading to increased projected frequency and severity of flooding.

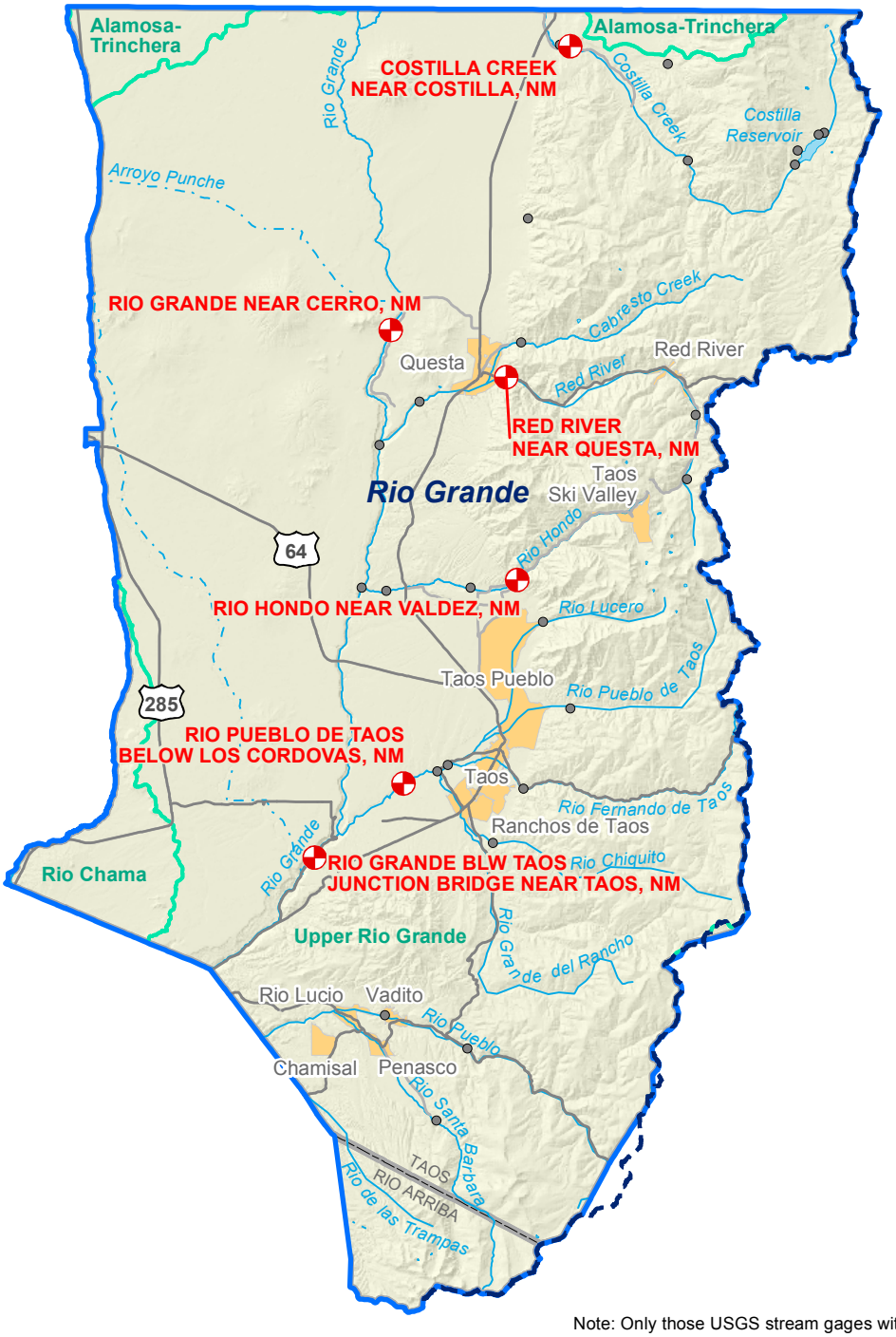
- Streamflows in major rivers across the Southwest are projected to decrease substantially during this century (e.g., Christensen et al., 2004; Hurd and Coonrod, 2008; USBR, 2011, 2013; Garfin et al., 2013) due to a combination of diminished cold season snowpack in headwaters regions and higher evapotranspiration in the warm season. The seasonal distribution of streamflow is projected to change as well: flows could be somewhat higher than at present in late winter, but peak runoff will occur earlier and be diminished. Late spring/early summer flows are projected to be much lower than at present, given the combined effects of less snow, earlier melting, and higher evaporation rates after snowmelt.

- Forest habitat is vulnerable to both decreases in cold-season precipitation and increases in warm-season vapor pressure deficit (Williams et al., 2010). Stress from either of these factors leaves forests increasingly susceptible to insects, forest fires, and desiccation. Higher temperatures increase insect survivability and fire risk.

To minimize the impact of these changes, it is imperative that New Mexico plan for variable water supplies, including focusing on drought planning and being prepared to maximize storage from extreme precipitation events while minimizing their adverse impacts.

5.2 Surface Water Resources

Surface water supplies approximately 80 percent of the water currently diverted in the Taos Water Planning Region. Its primary use has been for irrigated agriculture with a much smaller amount used for mining. The dominant waterways flowing in the region are the Rio Grande and its tributaries, Costilla Creek, Cabresto Creek, Red River, Rio Hondo, Rio Lucero, Rio Pueblo de Taos, Rio Fernando de Taos, Rio Grande del Rancho, Rio Pueblo, and Rio Santa Barbara. All surface streams in the planning region flow to the Rio Grande Basin. Major surface drainages (including both perennial and intermittent streams) in the planning region are shown on Figure 5-7.



Note: Only those USGS stream gages with daily data are shown.
Source: USGS, 2014c and 2014d

Explanation

- Selected USGS stream gage
- USGS stream gage
- Stream (dashed where intermittent)
- Lake
- River basin
- Watershed
- City
- County
- Water planning region

N

0 5 10 Miles

TAOS
REGIONAL WATER PLAN 2016

Major Surface Drainages, Stream Gages, Reservoirs, and Lakes

Figure 5-7

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Another important source of supply to the region is water from the San Juan-Chama Project. Taos Pueblo (2,215 acre-feet), the Town of Taos (766 acre-feet), the Town of Red River (60 acre-feet), El Prado Water and Sanitation District (40 acre-feet), and Village of Taos Ski Valley (15 acre-feet) contract with the U.S. Bureau of Reclamation for delivery of San Juan-Chama Project water. In general, this water will be used to offset groundwater pumping depletions to the Rio Grande.

When evaluating surface water information, it is important to note that streamflow does not represent available supply due to water rights limitations. The administrative water supply discussed in Section 5.5 represents the available supply considering both physical and legal limitations. The information provided in this section is intended to illustrate the variability and magnitude of streamflow and particularly the relative magnitude of streamflow in recent years.

Streamflow data are collected by the U.S. Geological Survey (USGS) and various cooperating agencies at several stream gage sites in the planning region. Table 5-4a lists the locations and periods of record for data collected at stream gages in the region, as well as the drainage area and estimated irrigated acreage for surface water diversions upstream of the station. Table 5-4b provides the minimum, median, and maximum annual yield for all gages that have 10 or more years of record.

In addition to the large variability in annual yield, streamflow also varies from month to month within a year, and monthly variability or short-term storms can have flooding impacts, even when annual yields are low. Table 5-5 provides monthly summary statistics for each of the stations with 10 or more years of record and indicates that most of the streamflow occurs in the March to June snowmelt runoff period. Relatively low flows are observed in August through February. Recent analysis of climate trends in the northern mountain climate division east of the Taos region (Salgado and Gutzler, 2013) indicated that prior to 2000 a greater percentage of flow occurred in May and June and less in March and April than in more recent years, a possible indication of a trend in earlier snowmelt since 2000.

For this water planning update, six stream gages were analyzed in more detail. These stations were chosen because of their locations in the hydrologic system, completeness of record, and representativeness as key sources of supply. Figure 5-8 shows the minimum and median annual water yield for these gages. Figures 5-9a through 5-9c show the annual water yield from the beginning of the period of record through 2013 for the six gages. As shown in these figures, streamflow varies greatly from year to year, with the highest-flow years supplying many times more water than the drier years. In recent years, flows have been exceptionally low (Figures 5-9a through 5-9c).

Table 5-4a. USGS Stream Gage Stations

USGS Station [a]							Period of Record	
Name [b]	Number	Latitude	Longitude	Elevation (ft amsl)	Drainage Area (sq mi)	Irrigated Upstream Land [c] (acres)	Start Date	End Date
Costilla Creek Above Costilla Dam, NM	08252500	36.8983611	–105.254667	9,454	25	1,300	5/1/1937	Present
Casias Creek Near Costilla, NM	08253000	36.8968556	–105.260458	9,437	17	1,300	5/1/1937	Present
Santistevan Creek Near Costilla, NM	08253500	36.8841667	–105.281111	9,520	2	NA	5/1/1937	Present
Costilla Creek Below Costilla Dam, NM	08254000	36.8728056	–105.283667	9,300	55	1,300	4/9/1937	Present
Costilla Creek Near Amalia, NM	08254500	36.8758593	–105.390006	8,521	152	—	5/13/1949	10/6/1981
Ute Creek Near Amalia, NM	08255000	36.9528015	–105.410285	8,900	12	—	5/1/1949	9/30/1959
Costilla Creek Near Costilla, NM	08255500	36.9668611	–105.507111	7,936	195	2,000	3/7/1936	Present
Acequia Madre at Costilla, NM	08256000	36.9675223	–105.516398	—	—	—	10/1/1965	6/30/1992
Costilla Cr Bel Div at Costilla, NM	08260500	36.9675223	–105.517231	7,861	197	—	10/1/1964	10/14/1986
Latir Creek Near Cerro, NM	08263000	36.8291917	–105.547785	8,280	11	—	10/1/1945	9/30/1970
Rio Grande Near Cerro, NM	08263500	36.7400167	–105.683442	7,110	8,440	620,000 [d] 7,000 [e]	10/1/1948	Present
Red River Near Red River, NM	08264000	36.622252	–105.389451	9,394	19	—	10/1/1943	9/30/1964
Red River Below Zwergle Damsite Nr Red River, NM	08264500	36.6736408	–105.381116	8,872	26	—	5/1/1963	12/31/1973
Red River Near Questa, NM	08265000	36.7033111	–105.568431	7,452	113	"A few hundred acres"	10/1/1924	Present
Cabresto Creek Near Questa, NM	08266000	36.7305822	–105.553894	7,845	37	—	10/1/1943	9/30/1996
Red River Below Fish Hatchery, Near Questa, NM	08266820	36.6828389	–105.654122	7,105	185	3,000	8/9/1978	Present
Red River at Mouth, Near Questa, NM	08267000	36.6480781	–105.693342	6,600	190	—	12/1/1950	9/30/1978

Source: USGS, 2014c (unless otherwise noted)

[a] Only those USGS stream gages with daily data are shown.

[b] **Bold** indicates gages in key locations selected for additional analysis.

[c] Source: DBS&A, 2008; USGS, 2014a

[d] Colorado

[e] New Mexico

USGS = U.S. Geological Survey

ft amsl = Feet above mean sea level

sq mi = Square miles

NA = Not available

— = Data not available from current source(s).

Table 5-4a. USGS Stream Gage Stations

USGS Station [a]							Period of Record	
Name [b]	Number	Latitude	Longitude	Elevation (ft amsl)	Drainage Area (sq mi)	Irrigated Upstream Land [c] (acres)	Start Date	End Date
Rio Hondo Near Valdez, NM	08267500	36.5417972	–105.556522	7,650	36	NA	10/1/1934	Present
Rio Hondo at Damsi at Valdez, NM	08268200	36.535303	–105.60251	7,254	40	—	4/1/1963	9/30/1966
Arroyo Hondo at Arroyo Hondo, NM	08268500	36.5322451	–105.685567	6,670	66	—	10/1/1912	9/30/1985
Rio Grande Near Arroyo Hondo, NM	08268700	36.5344666	–105.710012	6,470	8,760	—	3/1/1963	9/30/2004
Rio Pueblo De Taos Near Taos, NM	08269000	36.4394444	–105.503611	7,380	67	0	1/1/1913	Present
Rio Lucero Near Arroyo Seco, NM	08271000	36.5082889	–105.530964	8,051	17	0	1/1/1913	Present
Rio Fernando De Taos Near Taos, NM	08275000	36.3755825	–105.549178	7,140	72	—	1/1/1963	10/17/1980
Rio Pueblo De Taos Near Ranchito, NM	08275300	36.393914	–105.623623	6,747	199	—	3/1/1957	10/15/1980
Rio Grande Del Rancho Near Talpa, NM	08275500	36.3031028	–105.581003	7,240	83	0 [f]	10/1/1952	Present
Rio Chiquito Near Talpa, NM	08275600	36.3319708	–105.578901	7,223	37	—	3/1/1957	10/17/1980
Rio Pueblo De Taos at Los Cordovas, NM	08276000	36.3889138	–105.633901	6,710	359	12,000 [g]	4/1/1910	9/30/1965
Rio Pueblo De Taos Below Los Cordovas, NM	08276300	36.3793333	–105.667833	6,650	380	—	4/1/1957	Present
Rio Grande Blw Taos Junction Bridge Near Taos, NM	08276500	36.3200333	–105.754444	6,050	9,730	620,000 [d] 30,000 [e]	10/1/1925	Present
Rio Pueblo Nr Penasco, NM	08277470	36.1684667	–105.602789	7,760	101	NA	12/1/1991	Present
Pueblo C N Penasco, NM	08278000	36.1944697	–105.683904	7,500	—	—	4/1/1936	9/30/1941
Rio Santa Barbara Nr Penasco, NM	08278500	36.1111377	–105.632515	8,300	38	—	10/1/1952	9/30/2004

Source: USGS, 2014c (unless otherwise noted)

[a] Only those USGS stream gages with daily data are shown.

[b] **Bold** indicates gages in key locations selected for additional analysis.

[c] Source: DBS&A, 2008; USGS, 2014a

[d] Colorado

[e] New Mexico

[f] Minor diversions for irrigation

[g] About 1,700 acres from the Rio Hondo

USGS = U.S. Geological Survey

ft amsl = Feet above mean sea level

sq mi = Square miles

NA = Not available

— = Data not available from current source(s).

Table 5-4b. USGS Stream Gage Annual Statistics for Stations with 10 or More Years of Record

USGS Station Name [a]	Annual Yield [b] (acre-feet)			Number of Years [c]
	Minimum	Median	Maximum	
Costilla Creek Below Costilla Dam, NM	6,313	11,873	28,959	40
Costilla Creek Near Costilla, NM	11,221	28,959	62,913	70
Latir Creek Near Cerro, NM	1,919	3,660	6,718	24
Rio Grande Near Cerro, NM	87,672	271,777	896,271	62
Red River Near Red River, NM	5,343	10,860	19,258	12
Red River Below Zwergle Damsite Nr Red River, NM	6,342	12,742	20,850	10
Red River Near Questa, NM	6,856	28,380	65,157	47
Cabresto Creek Near Questa, NM	3,765	6,885	17,158	52
Red River Below Fish Hatchery, Near Questa, NM	23,312	56,180	96,143	34
Red River at Mouth, Near Questa, NM	34,895	52,343	88,252	27
Rio Hondo Near Valdez, NM	6,617	22,696	51,908	78
Arroyo Hondo at Arroyo Hondo, NM	6,704	14,624	49,302	67
Rio Grande Near Arroyo Hondo, NM	168,033	465,076	1,067,127	33
Rio Pueblo de Taos Near Taos, NM	3,526	16,941	52,850	61
Rio Lucero Near Arroyo Seco, NM	3,620	14,697	35,836	68
Rio Fernando de Taos Near Taos, NM	760	2,353	14,769	17
Rio Pueblo de Taos Near Ranchito, NM	5,567	16,362	79,709	22
Rio Grande del Rancho Near Talpa, NM	2,114	11,837	32,289	56
Rio Chiquito Near Talpa, NM	1,788	4,988	15,782	22
Rio Pueblo de Taos at Los Cordovas, NM	10,498	35,004	142,766	52
Rio Pueblo de Taos Below Los Cordovas, NM	6,646	32,072	140,739	55
Rio Grande Blw Taos Junction Bridge Near Taos, NM	194,385	473,836	1,366,126	87
Rio Pueblo Nr Penasco, NM	4,959	24,180	90,351	21
Rio Santa Barbara Nr Penasco, NM	7,384	21,828	35,112	16

Source: USGS, 2014c

[a] Stations with complete years of data only
Bold indicates gages in key locations selected for additional analysis.

[b] Based on calendar years;

[c] Number of years used in calculation of annual yield statistics

Table 5-5. USGS Stream Gage Average Monthly Streamflow for Stations with 10 or More Years of Record

USGS Station [a]	Complete Years [b]	Average Monthly Streamflow [c] (acre-feet)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Costilla Creek Near Costilla, NM	70	493	519	1,127	2,988	7,079	6,589	5,065	4,116	2,236	919	684	549
Latir Creek Near Cerro, NM	24	126	121	142	250	671	991	463	364	265	208	164	139
Rio Grande Near Cerro, NM	62	18,108	19,414	29,331	30,837	55,506	61,287	25,772	14,064	10,756	12,754	20,340	18,256
Red River Near Red River, NM	12	243	216	260	615	2,433	3,717	1,401	896	564	431	328	277
Red River Below Zwergle Damsite Nr Red River, NM	10	344	291	352	670	2,309	3,233	1,672	1,183	784	615	464	384
Red River Near Questa, NM	47	757	711	1,010	2,317	7,066	7,528	3,542	2,247	1,646	1,364	971	726
Cabresto Creek Near Questa, NM	52	280	258	342	796	2,078	1,404	707	595	457	408	324	287
Red River Below Fish Hatchery, Near Questa, NM	34	2,582	2,346	2,862	4,486	10,687	10,578	5,507	3,938	3,358	3,139	2,723	2,570
Red River at Mouth, Near Questa, NM	27	3,056	2,794	3,105	4,192	8,865	9,050	5,337	4,572	3,619	3,504	3,202	3,021
Rio Hondo Near Valdez, NM	78	655	589	878	1,970	5,746	6,417	2,820	1,712	1,299	1,121	866	732
Arroyo Hondo at Arroyo Hondo, NM	67	1,016	925	1,026	1,563	4,638	4,831	1,576	828	758	802	912	1,107
Rio Grande Near Arroyo Hondo, NM	33	26,244	27,228	40,656	45,383	79,302	89,990	43,699	22,919	18,783	21,548	29,926	26,347
Rio Pueblo de Taos Near Taos, NM	61	420	407	863	2,943	6,833	3,963	1,309	877	651	587	521	474
Rio Lucero Near Arroyo Seco, NM	68	366	328	558	1,276	3,478	3,920	1,725	1,059	787	680	520	434
Rio Fernando de Taos Near Taos, NM	17	78	99	242	780	1,693	523	164	129	76	73	83	81

Source: USGS, 2014c

[a] **Bold** indicates gages in key locations selected for additional analysis.

USGS = U.S. Geological Survey

[b] Monthly statistics are for complete months with locations where 10 or more years of complete data were available.

[c] Data from USGS monthly statistics averaged over the entire period of record, converted to acre-feet (from cubic feet per second) and rounded to the nearest acre-foot.

Table 5-5. USGS Stream Gage Average Monthly Streamflow for Stations with 10 or More Years of Record

USGS Station [a]	Complete Years [b]	Average Monthly Streamflow [c] (acre-feet)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rio Pueblo de Taos Near Ranchito, NM	22	1,063	1,106	1,420	3,051	6,469	4,136	1,035	849	697	892	1,120	1,126
Rio Grande del Rancho Near Talpa, NM	56	301	289	542	1,711	5,170	2,667	766	657	469	421	367	327
Rio Chiquito Near Talpa, NM	22	149	149	222	826	2,243	1,051	394	352	251	218	186	168
Rio Pueblo de Taos at Los Cordovas, NM	52	1,795	1,953	2,661	6,127	14,101	6,789	1,534	1,176	1,081	1,530	1,694	1,759
Rio Pueblo de Taos Below Los Cordovas, NM	55	1,885	1,988	2,803	6,093	13,839	7,103	1,594	1,300	1,201	1,488	1,796	1,938
Rio Grande Blw Taos Junction Bridge Near Taos, NM	87	29,445	30,192	41,361	49,988	103,324	99,295	42,775	24,880	22,139	25,146	30,953	30,090
Rio Pueblo Nr Penasco, NM	21	547	546	1,322	5,304	12,335	5,141	1,918	1,345	902	809	716	606
Rio Santa Barbara Nr Penasco, NM	16	436	378	664	2,018	6,364	5,910	1,968	2,015	1,304	829	641	508

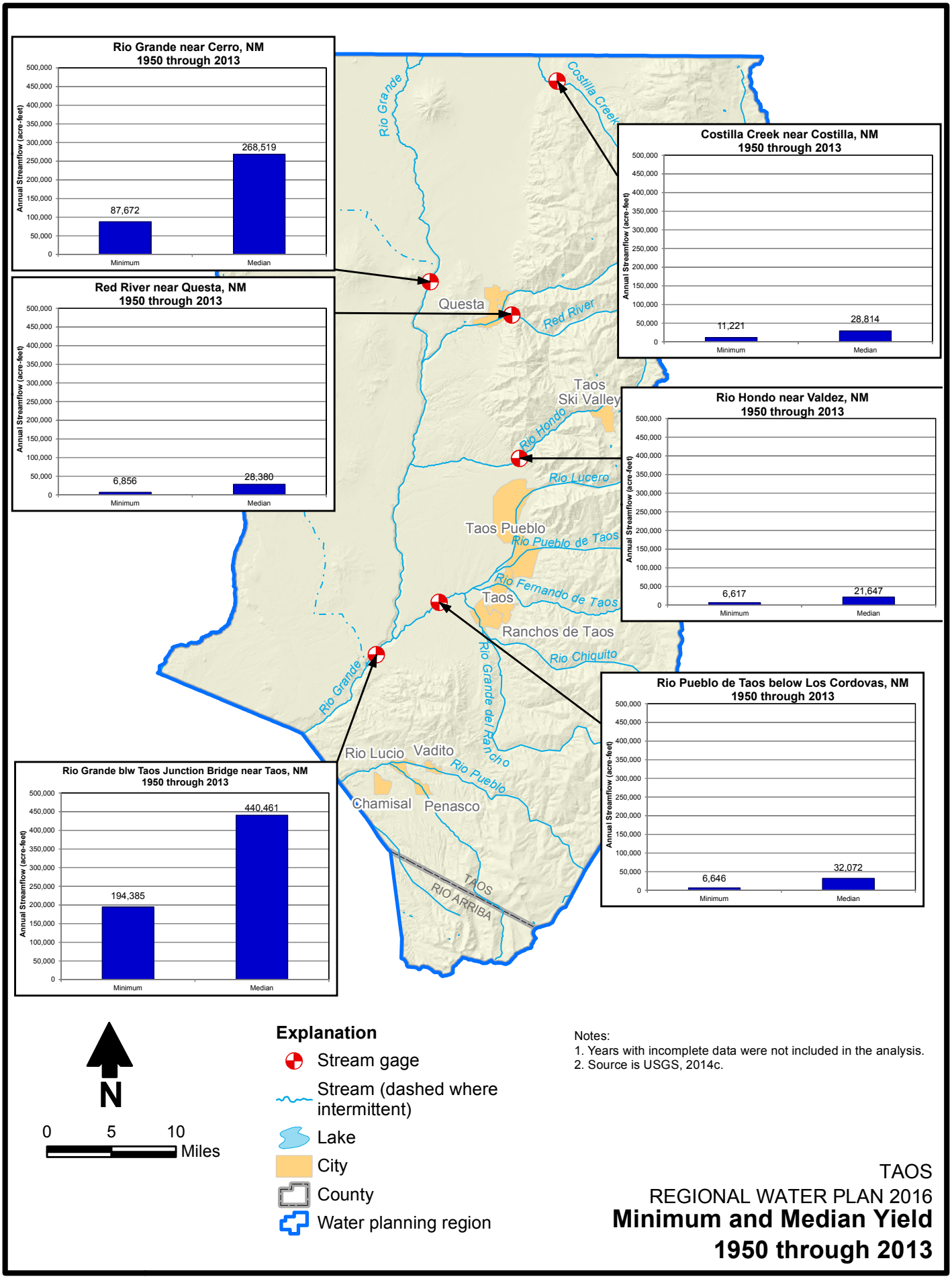
Source: USGS, 2014c

[a] **Bold** indicates gages in key locations selected for additional analysis.

[b] Monthly statistics are for complete months with locations where 10 or more years of complete data were available.

[c] Data from USGS monthly statistics averaged over the entire period of record, converted to acre-feet (from cubic feet per second) and rounded to the nearest acre-foot.

USGS = U.S. Geological Survey



TAOS
REGIONAL WATER PLAN 2016
Minimum and Median Yield
1950 through 2013

Figure 5-8

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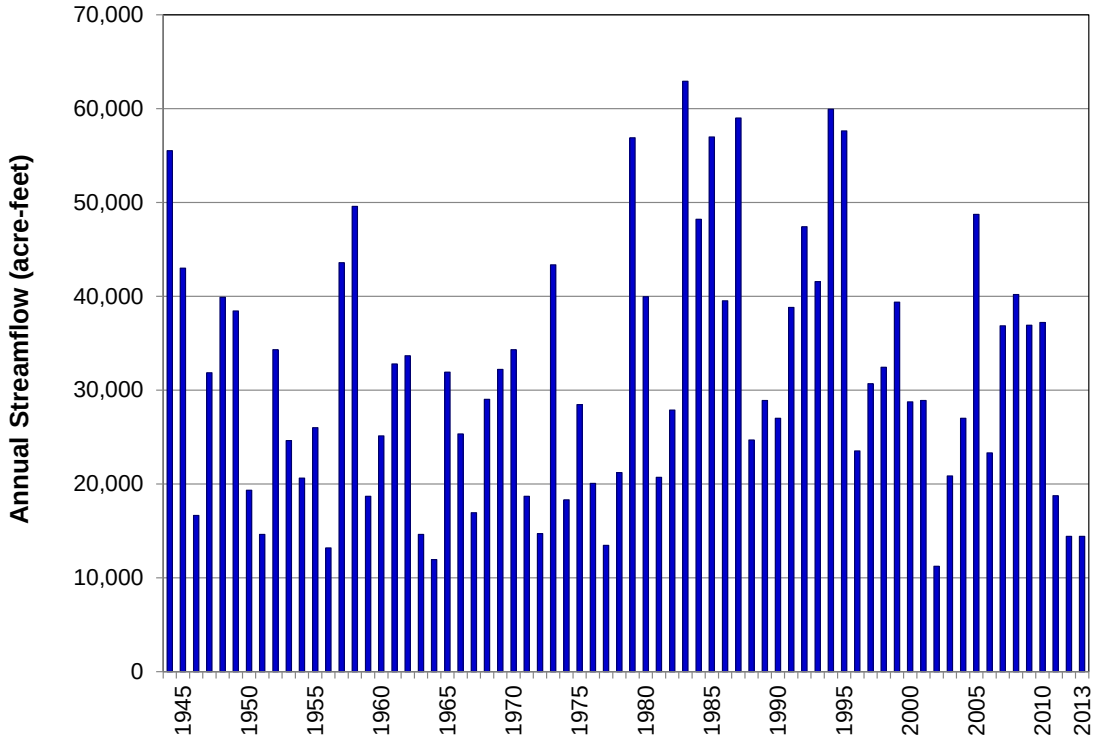
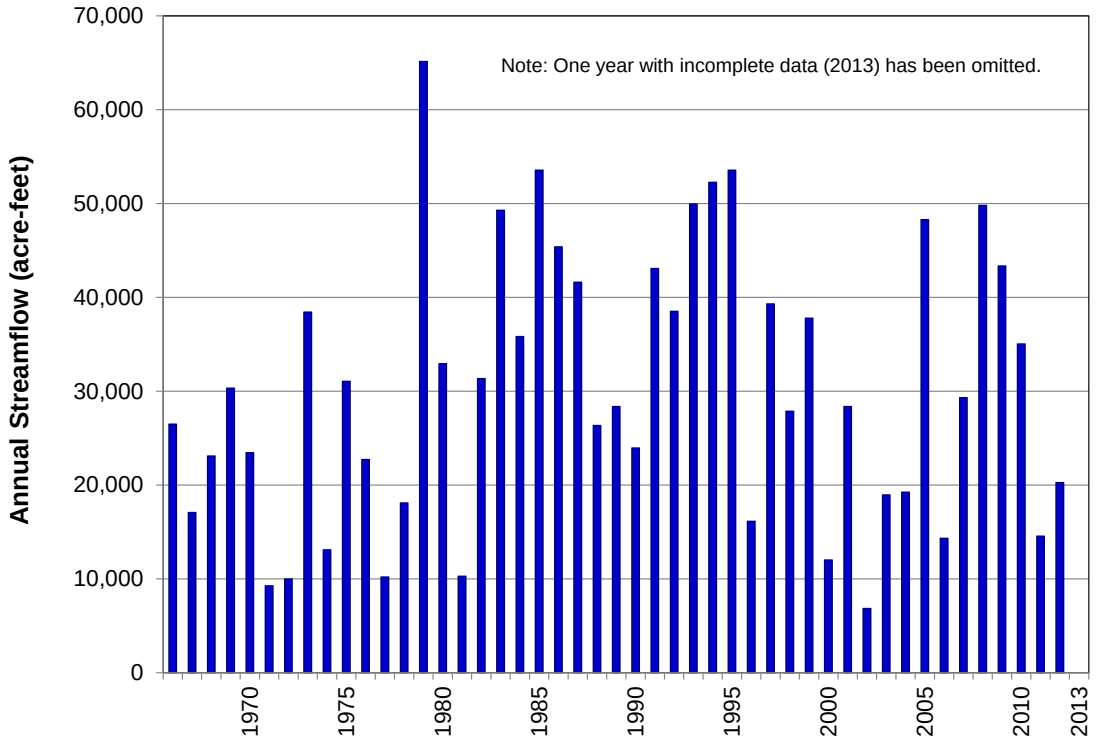
Costilla Creek near Costilla, NM



Red River near Questa, NM



TAOS
REGIONAL WATER PLAN 2016

Annual Streamflow for Selected Gaging Stations on Costilla Creek and the Red River

Figure 5-9a

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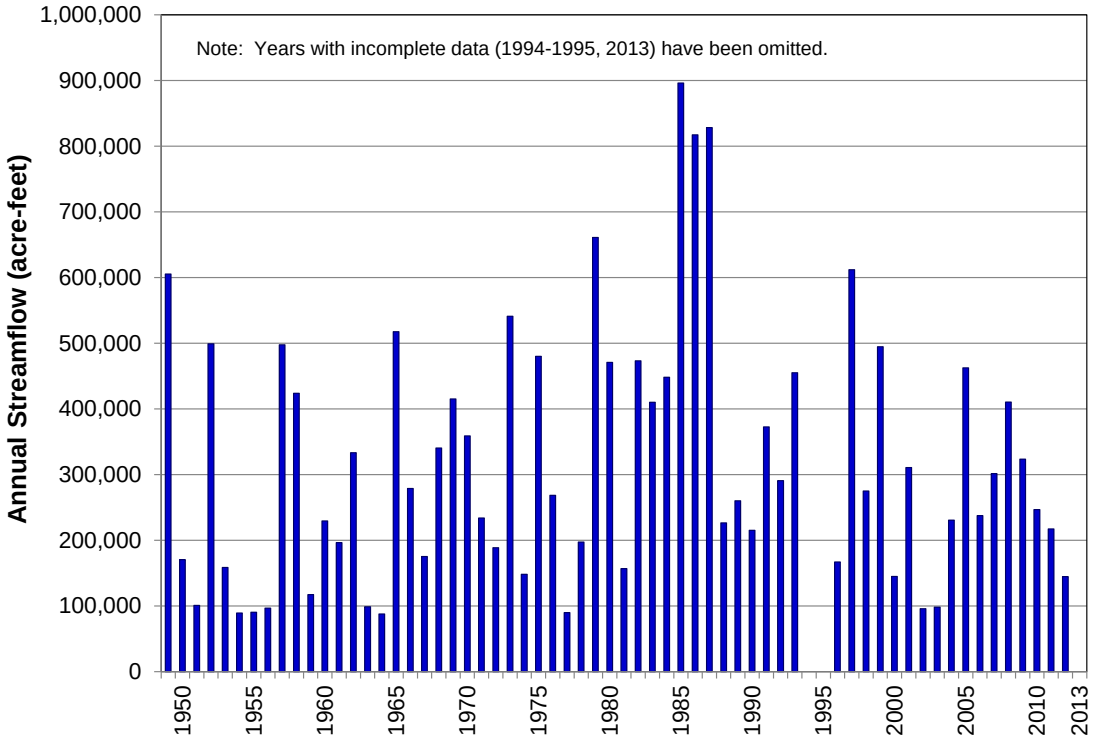
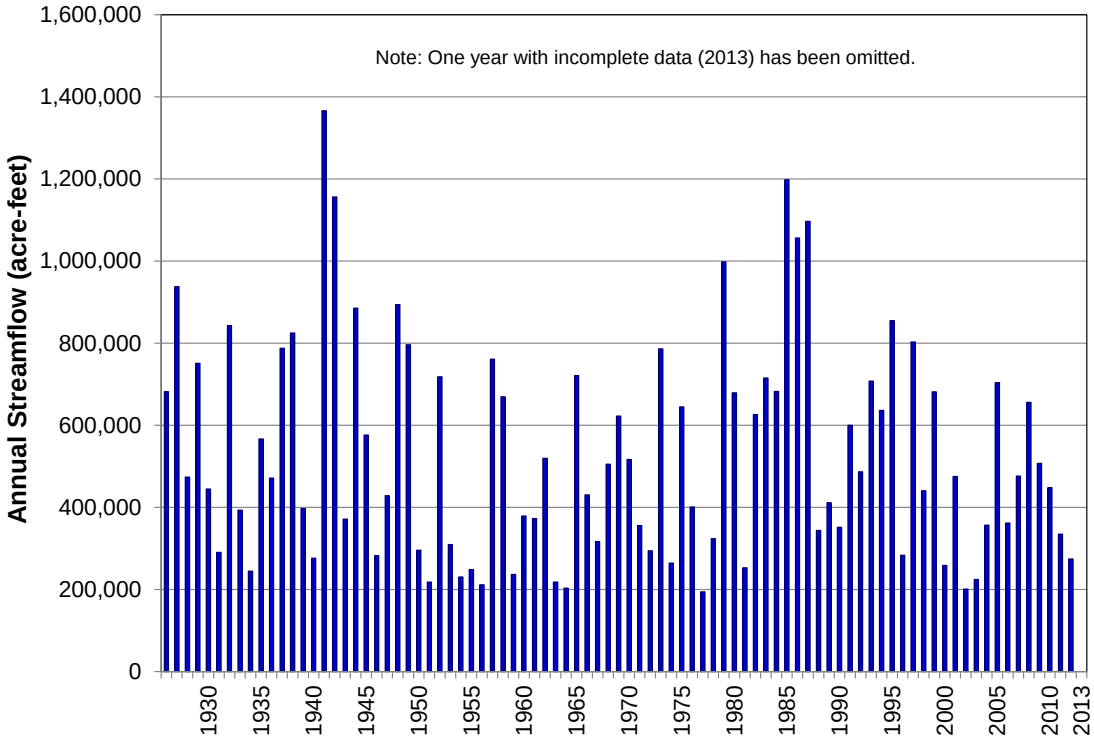
Rio Grande near Cerro, NM



Rio Grande blw Taos Junction Bridge near Taos, NM



TAOS
REGIONAL WATER PLAN 2016

Annual Streamflow for Selected Gaging Stations on the Rio Grande

Figure 5-9b

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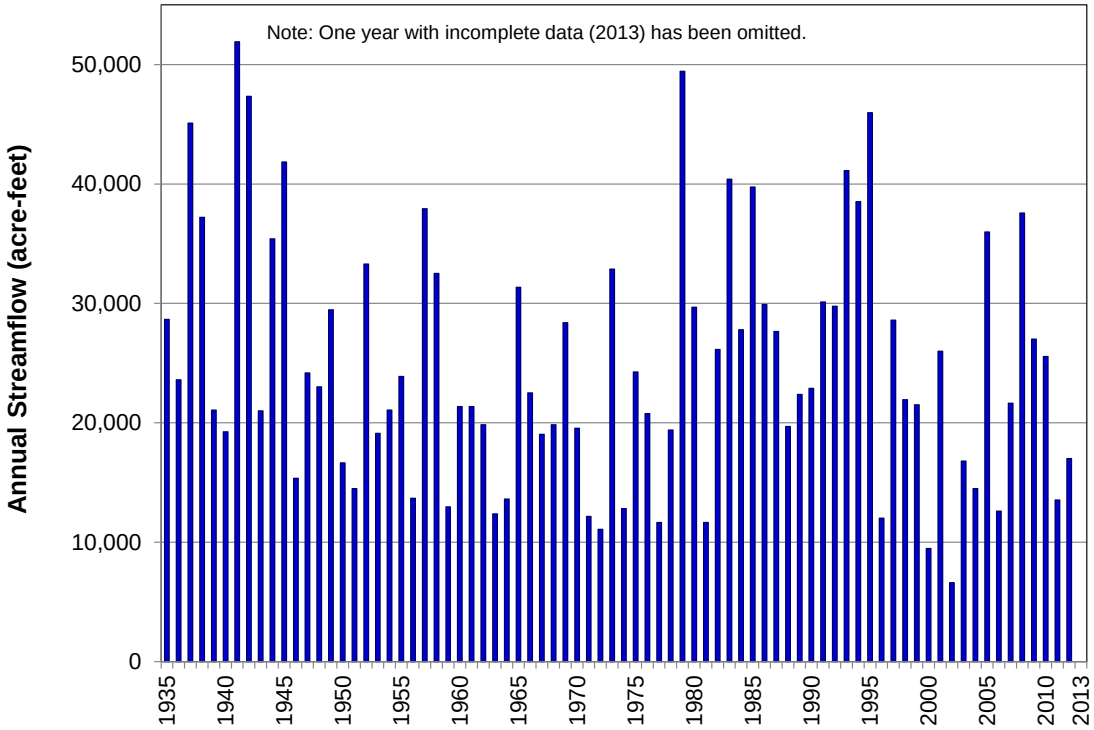
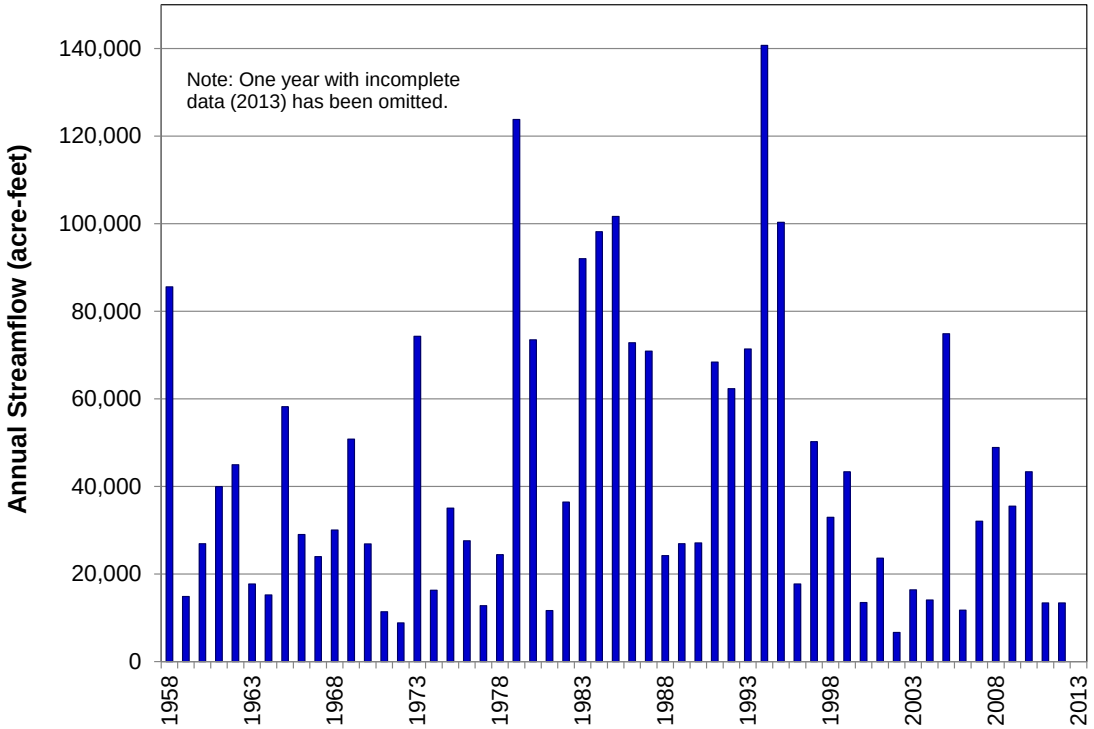
Rio Hondo near Valdez, NM



Rio Pueblo de Taos below Los Cordovas, NM



TAOS
REGIONAL WATER PLAN 2016

Annual Streamflow for Selected Gaging Stations on the Rio Hondo and Rio Pueblo de Taos

Figure 5-9c

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Table 5-6 summarizes the characteristics of the one large reservoir (i.e., storage capacity greater than 5,000 acre-feet, as reported in the *New Mexico Water Use by Categories 2010* report [Longworth et al., 2013]) in the region. In addition to this reservoir, several smaller lakes and reservoirs are present in the region (Figure 5-7); information on these smaller reservoirs was included in the accepted plan (DBS&A, 2008).

The NMOSE conducts periodic inspections of non-federal dams in New Mexico to assess dam safety issues. Dams that equal or exceed 25 feet in height that impound 15 acre-feet of storage or dams that equal or exceed 6 feet in height and impound at least 50 acre-feet of storage are under the jurisdiction of the State Engineer. These non-federal dams are ranked as being in good, fair, poor, or unsatisfactory condition. Dams with unsatisfactory conditions are those that require immediate or remedial action. Dams identified in recent inspections as being deficient, with high or significant hazard potential, are summarized in Table 5-7.

5.3 Groundwater Resources

Groundwater, which within the planning region is used primarily for commercial, mining, public water supply, and domestic household use, accounted for approximately 20 percent of all water diversions in the year 2010 (Longworth et al., 2013). Though this is a relatively low percentage of the total use in the planning region, groundwater provides drinking water for all the 101, mostly small water systems (the Red River system also uses surface water), and domestic wells in the region (NMED, 2014a).

As discussed in Section 4.5.5.2, groundwater resources in New Mexico are administered by the NMOSE through declared groundwater basins; the Taos Region resides in the Rio Grande Basin (Figure 4-1)

5.3.1 Regional Hydrogeology

The geology that controls groundwater occurrence and movement within the planning region was described in the accepted *Taos Regional Water Plan* (DBS&A, 2008), based on studies by Upson (1939), Winograd (1959), Coons and Kelly (1984), Garrabrant (1993), Bauer et al. (1999), Benson (2004), Drakos et al. (2004a, 2004b), and Rawling (2005). Since the original plan was published, additional work by the New Mexico Bureau of Geology & Mineral Resources include hydrogeologic investigations of the northern Taos Plateau (Johnson and Bauer, 2012), the Questa area (Bauer et al., 2015), and southern Taos Valley (Johnson and Bauer, in progress). A map illustrating the surface geology of the planning region, derived from a geologic map of the entire state of New Mexico by the New Mexico Bureau of Geology & Mineral Resources (2003), is included as Figure 5-10.

Table 5-6. Reservoirs and Lakes (greater than 5,000 acre-feet) in the Taos Water Planning Region

River	Reservoir	Primary Purpose	Operator	Date Completed	Total Storage Capacity (acre-feet)	Surface Area (acres)	Dam Height (feet)	Dam Length (feet)
Taos County								
Rio Costilla	Costilla Reservoir	Irrigation	Rio Costilla Cooperative Livestock Association	1920	30,400	416	138	780

Source: USACE, 1999

Table 5-7. Dams with Dam Safety Deficiency Rankings

Dam	Condition Assessment [a]	Deficiency	Hazard Potential [b]	Estimated Cost to Repair ($)
Taos County				
Carson Dam	Poor	Spillway capacity 9% of required flood Sinkholes in reservoir no maintenance	High	3,000,000
Costilla Dam	Fair	Spillway capacity 70% of required flood Monitoring needed	High	150,000
RC&D Project Measure 83 Dam	Poor	Woody vegetation In spillway Potential erosion of downstream toe Lack of design information	High	100,000

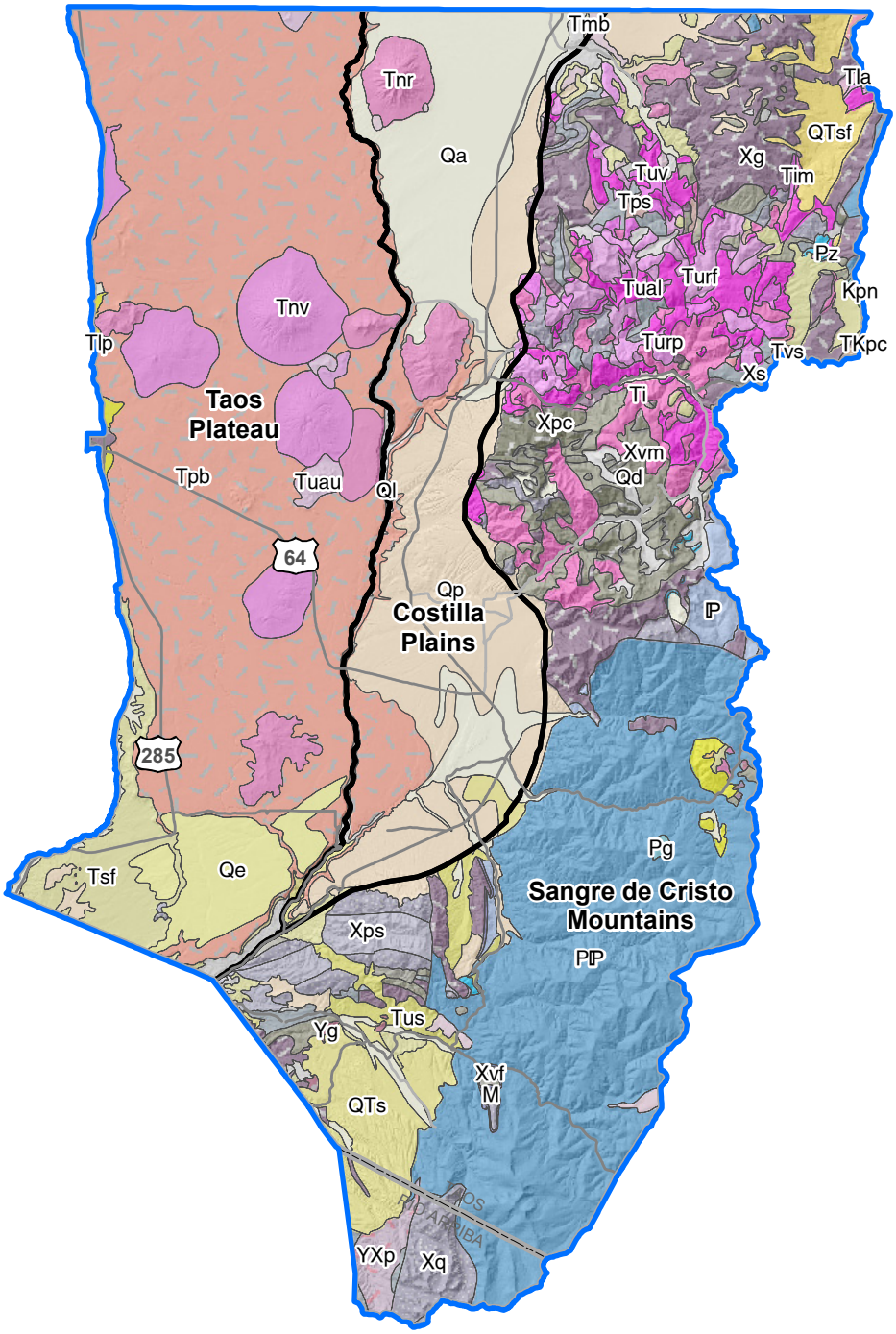
Source: NMOSE, 2014b PMP= Probable maximum precipitation

[a] Condition assessment:

	2008 US Army Corps of Engineers Criteria (adopted by NM OSE in FY09)	*NMOSE Spillway Risk Guidelines*
Fair:	No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range [for the owner] to take further action.	Spillway capacity < 70% but ≥ 25% of the SDF.
Poor:	A dam safety deficiency is recognized for loading conditions, which may realistically occur. Remedial action is necessary. A poor condition is also used when uncertainties exist as to critical analysis parameters, which identify a potential dam safety deficiency. Further investigations and studies are necessary.	Spillway capacity < 25% of the SDF.

[b] Hazard Potential Classifications:

High: Dams where failure or mis-operation would likely result in loss of human life.



N

0 5 10 Miles

Explanation

- Physiographic province
- County
- Water planning region

Sources: 1. NMBGMR, 2003
2. DBS&A, 2005
3. Hawley, 1986

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Geology and Physiographic Provinces

Figure 5-10a

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Geology Explanation

- IP - Pennsylvanian rocks undivided
- IPs - Sandia Formation
- J - Upper and Middle Jurassic rocks, undivided
- Kdg - Dakota Group
- Kgc - Greenhorn Formation and Carlile Shale, undivided
- Kpn - Pierre Shale and Niobrara Formation
- Kvt - Vermejo Formation and Trinidad Sandstone
- M - Mississippian rocks, undivided
- PIP - Permian and Pennsylvanian rocks, undivided
- Pct - Cutler Formation
- Pg - Glorieta Sandstone
- Pz - Paleozoic rocks, undivided
- QTb - Basaltic to andesitic lava flows
- QTs - Upper Santa Fe Group
- QTsf - Santa Fe Group, undivided
- Qa - Alluvium
- Qd - Glacial deposits; till and outwash
- Qe - Eolian deposits
- Ql - Landslide deposits and colluvium
- Qp - Piedmont alluvial deposits
- TKpc - Poison Canyon Formation
- Ti - Tertiary intrusive rocks of intermediate to silicic composition
- Tim - Tertiary mafic intrusive rocks
- Tla - Lower middle Tertiary andesitic to dacitic lavas and pyroclastic flow breccias
- Tlp - Los Pinos Formation of lower Santa Fe Group
- Tlrp - Lower middle Tertiary rhyolitic to dacitic pyroclastic rocks of the Datil Group, ash-flow tuffs
- Tmb - Basaltic to andesitic lava flows
- Tnr - Silicic to intermediate volcanic rocks
- Tnv - Intermediate to silicic volcanic rocks
- Tpb - Basaltic to andesitic lava flows
- Tps - Paleogene sedimentary units
- Tsf - Lower Santa Fe Group
- Tual - Lower-upper middle Tertiary basaltic andesites and andesites of the Mogollon Group
- Tuau - Upper middle Tertiary basaltic andesites and andesites of the Mogollon Group
- Turf - Upper middle Tertiary rhyolitic lavas and local tuffs
- Turp - Upper middle Tertiary rhyolitic pyroclastic rocks of the Mogollon Group, ash-flow tuffs
- Tus - Upper Tertiary sedimentary units
- Tuv - Upper middle Tertiary volcanic rocks
- Tvs - Middle Tertiary volcaniclastic sedimentary units
- Xg - Paleoproterozoic granitic plutonic rocks
- Xpc - Paleoproterozoic calc-alkaline plutonic rocks
- Xps - Paleoproterozoic pelitic schist
- Xq - Paleoproterozoic quartzite
- Xs - Paleoproterozoic metasedimentary rocks
- Xvf - Paleoproterozoic rhyolite and felsic volcanic schist
- Xvm - Paleoproterozoic mafic metavolcanic rocks with subordinate felsic metavolcanic rocks
- YXp - Mesoproterozoic and Paleoproterozoic plutonic rocks, undivided
- Yg - Mesoproterozoic granitic plutonic rocks
- Ꞧc - Chinle Group

Source: NMBGMR, 2003

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Geology Explanation

Figure 5-10b

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The Taos region lies within three physiographic regions: the Taos Plateau, the Costilla Plains, and the Sangre de Cristo Mountains (Figure 5-10) (Garrabrant, 1993; Upson, 1971). The following descriptions of the physiographic provinces are adapted primarily from Garrabrant (1993), except where noted.

- The Taos Plateau, consists of locally erupted Pliocene basaltic rocks (Bauer et al., 1999) intermixed with Santa Fe Group sediments. This region contains numerous extinct volcanoes, which were associated with the onset of rifting (Dungan et al., 1984, Johnson and Bauer, 2012).

- The Costilla Plains Province is present in the central part of the Taos Region (Figure 5-10). It consists of alluvial-fan and valley-fill sediments that slope gently down and were derived from the Sangre de Cristo Mountains located to the east. This region also contains interbedded volcanic rocks.

- The Sangre de Cristo Mountains Province spans the eastern side of the planning region (Figure 5-10). This province is an upthrown fault block composed of Precambrian granite, gneiss, schist, quartzite, and pegmatites, with Paleozoic-age sedimentary rocks in the south, including arkose, conglomerate, dolomite, limestone, sandstone, red and gray shale, and siltstone.

The Taos Plateau and the Costilla Plains provinces are within the southern part of the larger San Luis Basin. The San Luis Basin forms the northern segment of the Rio Grande Rift that trends from the middle of Colorado south to Mexico. The Rio Grande Rift contains a series of asymmetric grabens, formed by a roughly east-west extension of the earth's crust during the last approximately 30 million years (Kelley and Duncan, 1984; Dungan et al., 1984). The San Luis Basin dips eastward into a major boundary fault against the Sangre de Cristo Mountains, and it contains numerous intra-basin faults. The basin extends north into Colorado and south to where the Embudo constriction separates the San Luis Basin from the west-dipping Española Basin within the Rio Grande Rift (Coons and Kelly, 1984).

The primary water-bearing units present in the region are described below. Additional detail is provided in the accepted regional water plan (DBS&A, 2008).

- Recent Quaternary-age deposits are unconsolidated and include pediment gravels, fluvial terrace sands and gravels, and alluvial fan sands, silts, and gravels (Pazzaglia and Wells, 1990). These deposits host the shallow aquifers and provide areas for groundwater recharge (Bauer et al., 1999). The deposits may have a greater water-producing capacity than the underlying Santa Fe Group, but are generally less than 35 feet thick. Recent Quaternary deposits are present mostly in the Costilla Plains physiographic region.

- The Servilleta Formation is near the surface under most of the Taos Plateau and is overlain by Quaternary deposits that are thickest on the Costilla Plains. This east-dipping

formation is composed of basalt flows, some of which are fractured, with thin interbedded sediments. Generally, the Servilleta contains three basalt units, each consisting of one or more basalt flows with thicknesses as great as 40 feet.

- The Santa Fe Group underlies the recent Quaternary deposits in the Costilla Plains and basalt flows of the Servilleta Formation in the Taos Plateau. In the Taos region, it consists of three units: the Miocene-age Chamita Formation, the Ojo Caliente member of the Tesuque Formation, and the Chama-El Rito member of the Tesuque Formation.

The total thickness of basin-fill sediments may be as much as 10,000 feet, but variability in deposition and periodic erosion resulted in beds that are not traceable over long distances (Bauer et al., 1999).

5.3.2 Aquifer Conditions

Quantitative information regarding aquifer properties was provided in the accepted regional water plan (DBS&A, 2008), which included tabulated data of aquifer properties, and in general indicated the following:

- Groundwater is found in the valley alluvium and beneath perennial streams throughout the Taos Region (Garrabrant, 1993).
- Groundwater elevations in western Taos County indicate southeasterly flow with a gradient toward the Rio Grande, while groundwater elevations in the Town of Taos area indicate flow toward the Rio Grande with offsets occurring along faults (Benson, 2004).
- Depth to groundwater is shallowest along the Costilla Plains and near the Town of Taos and deepest in western Taos County. Wells in the deep Tertiary basin aquifer produce up to 500 gallons per minute (gpm), and the Taos Pueblo Indian Water Rights Settlement Agreement recommended additional development of this resource (USA et al., 2012).
- Most of the wells in the Taos Region are in the Costilla Plains, where groundwater can be found primarily in the Quaternary alluvial sediments above the Servilleta Formation, but also in deeper wells within the Servilleta Formation and the underlying Santa Fe Group. Depths to groundwater range from less than 1 foot to 275 feet below ground surface, and wells yield from 8 up to 3,000 gpm (Garrabrant, 1993). A significant study conducted by Peter Winograd in 1959 reported on the geology and hydrogeology of the Sunshine Valley area (northern Costilla Plains) and presented a conceptual model that is generally applicable to the region's aquifer systems today (Bauer et al., 1999). Conclusions of this study included (Winograd, 1959):
    - Groundwater in the Sunshine area originates primarily from mountain stream channel recharge from perennial streams in the region, including Costilla Creek.

- Pumping of groundwater in this area would cause a loss in gains to the Rio Grande. Wells could yield sufficient water from the alluvial sediments for irrigation.
- Unconfined and isolated semi-perched conditions exist for groundwater within the alluvial sediments.
- Groundwater quality in the alluvial sediments and the andesite basalt is very good.

- Scattered deeper wells completed in the Taos Plateau generally yield lower flow rates (Garrabrant, 1993). A limited volume of water is found in the fractured Servilleta basalt (Garrabrant, 1993), and low flow rates (1 to 5 gpm) are found in the underlying very fine-grained Ojo Caliente dune sand (Benson, 2004). The basalt and underlying Santa Fe Group sediments are probably recharged mainly from the Tusas Mountains and highlands, large volcanic domes, infiltration of direct surface precipitation, and large surface water features (Johnson and Bauer, 2012). Wells in the northern third of the Taos Plateau are about 200 to 300 feet deep and produce from the Miocene Los Pinos Formation (Benson, 2004).

- In the Sangre de Cristo Mountains groundwater is withdrawn from shallow wells in the alluvium of stream valley deposits. Runoff from precipitation recharges the alluvium. In general, the Precambrian and Tertiary formations do not store or yield much water (Garrabrant, 1993).

Much of the quantitative information regarding aquifer properties in the Taos Valley area was compiled and analyzed as part of the development of a settlement model for the Taos Pueblo Indian Water Rights Settlement. The model (Barroll and Burck, 2006; Barroll et al., 2012) was developed collaboratively between the NMOSE and other parties involved in the Settlement. The model documentation reported physical and calibrated data on recharge and hydraulic properties in the Taos Valley area. The modeled flow included the shallow aquifer, consisting of the Servilleta and shallower alluvial deposits, and a deeper aquifer that includes the Chamita Formation, the Ojo Caliente Sandstone Member or the Tesuque Formation, the Chama El Rito Member of the Tesuque Formation, and the Lower Picuris Formation. The deep aquifer is more than 2,000 feet thick, but the full depth has not been characterized. Hydraulic conductivities are lower underlying the Rio Hondo alluvial fan in the northern part of the Taos Valley modeled area, and more productive aquifer properties are found underlying the Rio Pueblo de Taos alluvial fan to the south. The deep aquifer is hydraulically connected to the Rio Grande (USA et al., 2012, Appendix C of Attachment 3). The Taos SWCD is concerned that wells used in the model may have incorrect location information and would like to see corrections made in future updates.

Another modeling effort included an integrated groundwater-surface water model for the Upper Rio Grande developed by Sandia National Laboratories (Roach and Tidwell, 2006). In the Upper Rio Grande in New Mexico, four MODFLOW-based distributed groundwater models of

the Taos, Española, Albuquerque, and Socorro groundwater basins were used to calibrate a spatially simplified groundwater model incorporating all four basins. The groundwater model is part of an integrated system dynamics based model that captures salient groundwater dynamics and surface water-groundwater interactions and runs quickly enough to support rapid basin-scale water policy scenario evaluation.

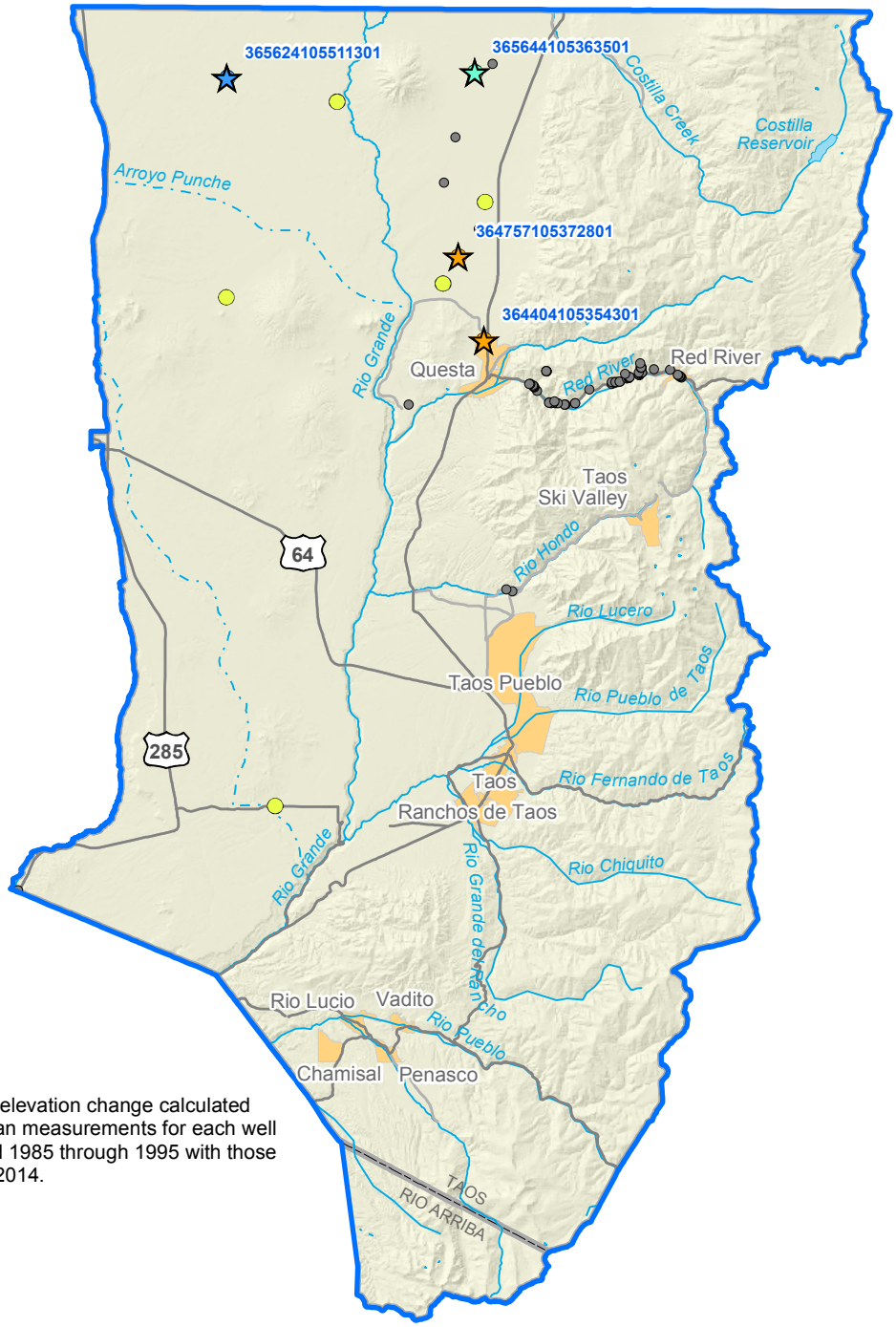
The major well fields in the area include:

- The largest well field in the area is the one operated by the Town of Taos, consisting of wells at various locations over an approximately 10-square mile area.
- The Town of Taos has developed a small well field for diversion of San Juan-Chama Project water (through exchange) on the Rio Pueblo de Taos, below Cordovas.

In addition to the Town's well fields, numerous individual wells, including domestic, stock, and public supply wells, are located throughout the region:

- Approximately 150 wells are located on the Taos Plateau, and an estimated 50 to 100 shallow wells are in the Rio Ojo Caliente valley (Benson, 2007). Most wells are for domestic use and range in depth from shallow, hand-dug wells to public supply wells that are 200 to 300 feet deep (Garrabrant, 1993).
- Numerous wells are present in the Sunshine Valley in the Costilla Plains.
- The Town of Questa pumps from the Costilla Plains.
- The Town of Red River pumps from the valley near the Red River in the Sangre de Cristo Mountains Province.
- Near Tres Piedras wells average about 780 to 960 feet in depth and yield about 1 gpm (Johnson and Bauer, 2012).
- Mutual domestic systems also operate wells throughout the region.

In order to evaluate changes in water levels over time, the USGS monitors groundwater wells throughout New Mexico (Figure 5-11). The periods of record for many of the wells are short (less than 10 years), and the hydrographs often exhibit periodic fluctuations or inconsistent patterns that do not indicate clear trends. Hydrographs illustrating groundwater levels versus time, as compiled by the USGS (2014b), were selected for four monitor wells with longer periods of record and are shown on Figure 5-12. Two wells north of Questa show declining water levels in recent years.



Note: Groundwater elevation change calculated by comparing median measurements for each well from the time period 1985 through 1995 with those from 2005 through 2014.

Source: USGS, 2014b

Explanation

- Selected USGS-monitored well
- Other USGS-monitored well
- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

Groundwater elevation change (ft)

- Decreased more than 20 ft
- Decreased 10 to 20 ft
- Decreased 1 to 10 ft
- Changed less than 1 ft
- Increased 1 to 10 ft
- Increased more than 10 ft

N

0 5 10 Miles

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U.S. Geological Survey Wells and Recent Groundwater Elevation Change

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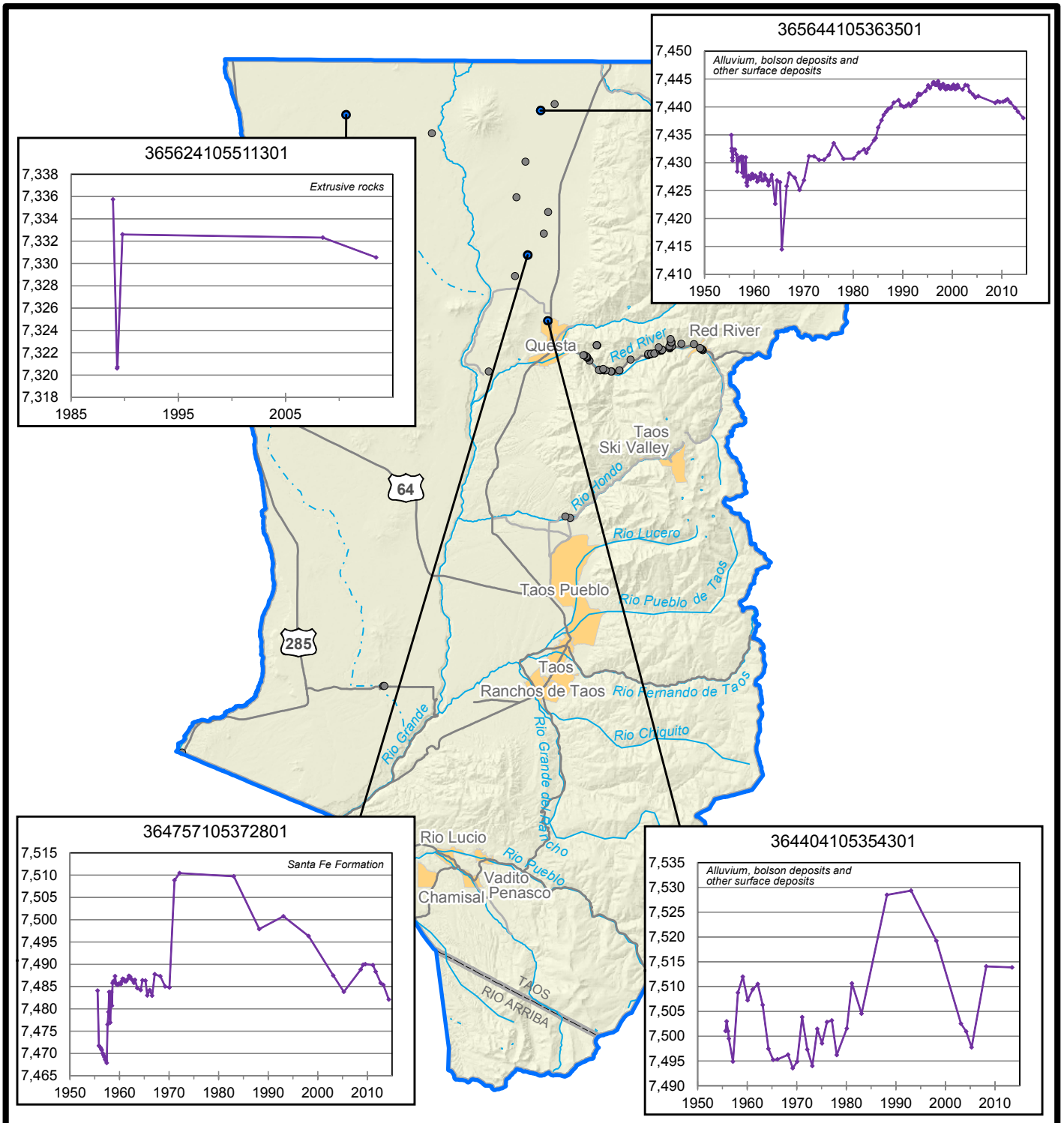
Figure 5-11



Source: USGS, 2014b
Note: Completion aquifer of well noted on each hydrograph.

TAOS
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Hydrographs of Selected Wells

Figure 5-12

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5.4 Water Quality

Assurance of ability to meet future water demands requires not only water in sufficient quantity, but also water that is of sufficient quality for the intended use. This section summarizes the water quality assessment that was provided in the accepted regional water plan and updates it to reflect new studies of surface and groundwater quality and current databases of contaminant sources. The identified water quality concerns should be a consideration in the selection of potential projects, programs, and policies to address the region's water resource issues.

Surface water quality in the Taos Water Planning Region is evaluated through periodic monitoring and comparison of sample results to pertinent water quality standards. Several reaches of rivers within the Upper Rio Grande watershed in the Taos Planning Region have been listed on the 2014-2016 New Mexico 303(d) list (NMED, 2014a). This list is prepared by every two years NMED and approved by the NMWQCC to comply with Section 303(d) of the federal Clean Water Act, which requires each state to identify surface waters within its boundaries that do not meet water quality standards (see Section 4.2.2.1.1).

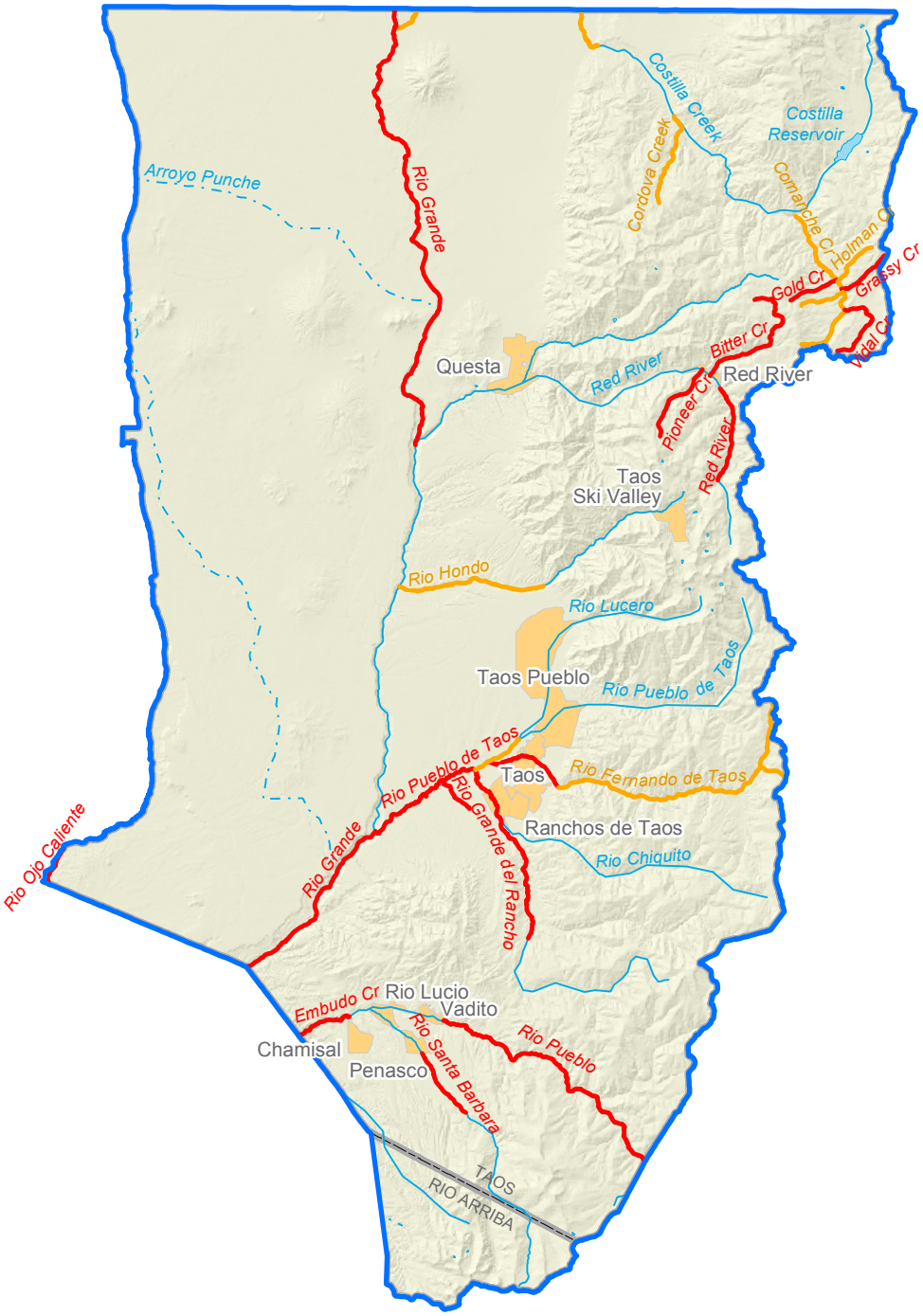
Section 303(d) further requires the states to prioritize their listed waters for development of total maximum daily load (TMDL) management plans, which document the amount of a pollutant a waterbody can assimilate without violating a state water quality standard and allocates that load capacity to known point sources and nonpoint sources at a given flow. Figure 5-13 shows the locations of lakes and stream reaches with impaired water quality. Table 5-8 provides details of impairment for those reaches. Common causes of impairment in the Taos region included temperature, sediment/turbidity, bacteria (*E. coli*), nutrients, and aluminum.

In evaluating the impacts of the 303(d) list on the regional water planning process, it is important to consider that impairments are tied to designated uses. Some problems can be very disruptive to a healthy aquatic community, while others reduce the safety of water recreation or increase the risk of fish consumption. Impairments will not necessarily make the water unusable for irrigation or even for domestic water supply, but the water may need treatment prior to use and the costs of this should be recognized.

Several types and sources of contaminants that have the potential to impact either surface or groundwater quality in the future are discussed below. Sources of contamination are considered as one of two types: (1) point sources, if they originate from a single location, or (2) nonpoint sources, if they originate over a more widespread or unspecified location. Information on both types of sources is provided below.

5.4.1 Potential Sources of Contamination to Surface and Groundwater

Specific sources that have the potential to impact either surface or groundwater quality in the future are discussed below. These include municipal and industrial sources, leaking underground storage tanks, landfills, and nonpoint sources.



Explanation

- Impaired stream (IR category 4)
- Impaired stream (IR category 5)
- Impaired lake (there are none in this region)
- Other stream (dashed where intermittent)
- Other lake
- City
- County
- Water planning region

Source: NMED, 2014a and 2014c
Note: See Table 5-8 for IR Category definitions.

N

0 5 10 Miles

TAOS
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Water Quality-Impaired Reaches

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Figure 5-13

Table 5-8. Total Maximum Daily Load Status of Streams in the Taos Water Planning Region

Waterbody Name [a] (basin, segment)	Assessment Unit ID	Affected Reach (miles [b])	Probable Sources of Pollutant	Uses Not Fully Supported [c]	Specific Pollutant	IR Category [d]
Taos County						
Apache Canyon (Rio Fernando de Taos to headwaters)	NM-98.A_002	1.5	Forest roads (road construction and use) On-site treatment systems (septic) Wildlife other than waterfowl Habitat modification Drought-related Impacts Road/Bridge runoff Rangeland grazing	PC	Escherichia coli	4A
Bernardin Lake	NM-9000.B_013	2 [e]	Not assessed	—	—	3/3A
Bitter Creek (Red River to headwaters)	NM-2120.A_705	8.33	Source unknown Surface mining Road/bridge runoff Natural sources Acid mine drainage	HQColdWAL	Aluminum Turbidity	5/5A
Bull Creek Lake	NM-9000.B_023	0.8 [e]	Not assessed	—	—	3/3A
Cabresto Lake	NM-2120.B_20	15.7 [e]	Not assessed	—	—	3/3A
Chuckwagon Creek (Comanche Creek to headwaters)	NM-2120.A_833	2.3	Not assessed	—	—	3/3A
Comanche Creek (Costilla Creek to headwaters)	NM-2120.A_827	10.29	Rangeland grazing	HQColdWAL	Temperature, water	4A
Cordova Creek (Costilla Creek to headwaters)	NM-2120.A_823	5.58	Recreational pollution sources Habitat modification Loss of riparian habitat Road/bridge runoff Streambank modifications/destabilization	HQColdWAL	Sedimentation/siltation	4A

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] HQColdWAL = High quality coldwater aquatic life
PC = Primary contact

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

Table 5-8. Total Maximum Daily Load Status of Streams in the Taos Water Planning Region

Waterbody Name [a] (basin, segment)	Assessment Unit ID	Affected Reach (miles [b])	Probable Sources of Pollutant	Uses Not Fully Supported [c]	Specific Pollutant	IR Category [d]
Taos County (cont.)						
Costilla Creek (CO border to Diversion abv Costilla)	NM-2120.A_810	3.16	Source unknown	HQColdWAL	Low flow alterations	4C
Costilla Creek (Rio Grande to CO border)	NM-2120.A_800	2.47	Source unknown	HQColdWAL	Low flow alterations	4C
Cow Lake	NM-2120.B_40	0.6 [e]	Not Assessed	—	—	3/3A
Eagle Rock Lake	NM-2120.B_10	3 [e]	Not Assessed	—	—	3/3A
Elk Lake	NM-9000.B_039	0.7 [e]	Not assessed	—	—	3/3A
Embudo Creek (Canada de Ojo Sarco to Picuris Pueblo bnd)	NM-2111_40	5.07	Source unknown	MCWAL, WWAL	Nutrient/eutrophication Biological indicators	5/5C
Gold Creek (Comanche Creek to headwaters)	NM-2120.A_835	2.87	Low water crossing Channelization Forest roads (road construction and use) Source unknown Wildlife other than waterfowl Drought-related Impacts Rangeland grazing	HQColdWAL	Aluminum Temperature, water	5/5C
Goose Creek (Red River to headwaters)	NM-2120.A_711	5.12	Not assessed	—	—	3/3A
Grassy Creek (Comanche Creek to headwaters)	NM-2120.A_836	3.11	Source unknown	HQColdWAL	Turbidity	5/5C

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
HQColdWAL = High quality coldwater aquatic life
MCWAL = Marginal coldwater aquatic life
PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

Table 5-8. Total Maximum Daily Load Status of Streams in the Taos Water Planning Region

Waterbody Name [a] (basin, segment)	Assessment Unit ID	Affected Reach (miles [b])	Probable Sources of Pollutant	Uses Not Fully Supported [c]	Specific Pollutant	IR Category [d]
Taos County (cont.)						
Heart Lake	NM-2120.B_70	4.3 [e]	Not assessed	—	—	3/3A
Holman Creek (Comanche Creek to headwaters)	NM-2120.A_837	2.85	Low water crossing Channelization Forest roads (road construction and use) Wildlife other than waterfowl Drought-related Impacts Rangeland grazing	HQColdWAL	Temperature, water	4A
Horseshoe Lake	NM-2120.B_90	6.9 [e]	Not assessed	—	—	3/3A
Horseshoe Lake (Alamitos)	NM-2120.B_25	7.9 [e]	Not assessed	—	—	3/3A
Indian Lake	NM-2120.B_35	3 [e]	Not assessed	—	—	3/3A
La Cueva Lake	NM-2120.B_45	2 [e]	Not assessed	—	—	3/3A
LaBelle Creek (Comanche Creek to headwaters)	NM-2120.A_839	2.57	Low water crossing Channelization Forest roads (road construction and use) Wildlife other than waterfowl Drought-related Impacts Rangeland grazing	HQColdWAL	Temperature, water	4A
Lost Lake	NM-2120.B_13	8.4 [e]	Not assessed	—	—	3/3A
Middle Fork Lake	NM-2120.B_55	8.3 [e]	Not assessed	—	—	3/3A
Nat Lake II	NM-9000.B_087	0.7 [e]	Not assessed	—	—	3/3A

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
HQColdWAL = High quality coldwater aquatic life
MCWAL = Marginal coldwater aquatic life
PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

Table 5-8. Total Maximum Daily Load Status of Streams in the Taos Water Planning Region

Waterbody Name [a] (basin, segment)	Assessment Unit ID	Affected Reach (miles [b])	Probable Sources of Pollutant	Uses Not Fully Supported [c]	Specific Pollutant	IR Category [d]
Taos County (cont.)						
Nat Lake IV	NM-9000.B_088	0.6 [e]	Not assessed	—	—	3/3A
Pioneer Creek (Red River to headwaters)	NM-2120.A_703	4.88	Source unknown Off-road vehicles	HQColdWAL	Sedimentation/siltation Turbidity	5/5A
Pioneer Lake	NM-2120.B_97	1.1 [e]	Not assessed	—	—	3/3A
Red River (Placer Creek to headwaters)	NM-2120.A_710	5.6	Source unknown	HQColdWAL	Nutrient/eutrophication Biological indicators	5/5A
Rio Fernando de Taos (R Pueblo d Taos to USFS bnd at canyon)	NM-2120.A_512	4.96	Low water crossing Livestock (grazing or feeding operations) On-site treatment systems (septic) Recreational pollution sources Construction Source unknown Wastes from pets Irrigated crop production Road/bridge runoff Inappropriate waste disposal Natural sources Rangeland grazing Streambank modifications/destabilization	PC, HQColdWAL	Escherichia coli Nutrient/eutrophication Biological indicators Sedimentation/siltation Specific conductance Temperature, water	5/5A

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
HQColdWAL = High quality coldwater aquatic life
MCWAL = Marginal coldwater aquatic life
PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

Table 5-8. Total Maximum Daily Load Status of Streams in the Taos Water Planning Region

Waterbody Name [a] (basin, segment)	Assessment Unit ID	Affected Reach (miles [b])	Probable Sources of Pollutant	Uses Not Fully Supported [c]	Specific Pollutant	IR Category [d]
Taos County (cont.)						
Rio Fernando de Taos (Tienditas Creek to headwaters)	NM-98.A_001	5.84	Low water crossing Waterfowl Livestock (grazing or feeding operations) On-site treatment systems (septic) Recreational pollution sources Wildlife other than waterfowl Wastes from pets Impervious surface/parking lot runoff Road/bridge runoff Rangeland grazing	PC	Escherichia coli	4A
Rio Fernando de Taos (UFSF bnd at canyon to Tienditas Creek)	NM-2120.A_513	10.85	Livestock (grazing or feeding operations) Forest roads (road construction and use) On-site treatment systems (septic) Recreational pollution sources Mining Wildlife other than waterfowl Habitat modification Impervious surface/parking lot runoff Off-road vehicles Road/bridge runoff	PC	Escherichia coli	4A
Rio Grande (Embudo Creek to Rio Pueblo de Taos)	NM-2111_12	15.19	Source unknown	MCWAL	Turbidity	5/5C

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
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MCWAL = Marginal coldwater aquatic life
PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

Table 5-8. Total Maximum Daily Load Status of Streams in the Taos Water Planning Region

Waterbody Name [a] (basin, segment)	Assessment Unit ID	Affected Reach (miles [b])	Probable Sources of Pollutant	Uses Not Fully Supported [c]	Specific Pollutant	IR Category [d]
Taos County (cont.)						
Rio Grande (Red River to CO border)	NM-2119_05	28.98	Source unknown Recreational pollution sources Habitat modification Loss of riparian habitat Watershed runoff following forest fire Flow alterations from water diversions	ColdWAL	Temperature, water pH	5/5A
Rio Grande del Rancho (Rio Pueblo de Taos to HWY 518)	NM-2120.A_501	11.36	Source unknown Road/bridge/infrastructure construction Habitat modification Natural sources Streambank modifications/destabilization Flow alterations from water diversions	HQColdWAL, PC	Escherichia coli Nutrient/eutrophication Biological indicators Specific conductance Temperature, water	5/5A
Rio Hondo (Rio Grande to USFS bnd)	NM-2120.A_600	8.56	Road/bridge runoff Rangeland grazing Streambank modifications/destabilization	HQColdWAL	Temperature, water	4A
Rio Ojo Caliente (Rio Chama to Rio Vallecitos)	NM-2113_10	34.91	Source unknown	WWAL ColdWAL	Nutrient/Eutrophication Biological indicators	5/5C
Rio Pueblo (Picuris Pueblo bnd to headwaters)	NM-2120.A_410	18.19	Source unknown	HQColdWAL	Nutrient/Eutrophication Biological indicators	5/5A
Rio Pueblo de Taos (Arroyo del Alamo to R Grande del Rancho)	NM-2119_30	5.37	Source unknown	ColdWAL	Nutrient/Eutrophication Biological indicators Temperature, water	5/5A

Source: NMED, 2014a

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[e] Acres

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Table 5-8. Total Maximum Daily Load Status of Streams in the Taos Water Planning Region

Waterbody Name [a] (basin, segment)	Assessment Unit ID	Affected Reach (miles [b])	Probable Sources of Pollutant	Uses Not Fully Supported [c]	Specific Pollutant	IR Category [d]
Taos County (cont.)						
Rio Pueblo de Taos (R Grande del Rancho to Taos Pueblo bnd)	NM-2120.A_511	3.05	Waterfowl Livestock (grazing or feeding operations) Recreational pollution sources Source unknown Wildlife other than waterfowl Habitat modification Wastes from pets Loss of riparian habitat Impervious surface/parking lot runoff Road/bridge runoff Inappropriate waste disposal Rangeland grazing Rural (residential areas)	HQColdWAL PC	Escherichia coli Temperature, water	4A
Rio Pueblo de Taos (Rio Grande to Arroyo del Alamo)	NM-2119_20	2.56	Source unknown Recreational pollution sources Habitat modification Rangeland grazing Flow alterations from water diversions	ColdWAL	Nutrient/Eutrophication Biological indicators Temperature, water	5/5C

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
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MCWAL = Marginal coldwater aquatic life
PC = Primary contact
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[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

Table 5-8. Total Maximum Daily Load Status of Streams in the Taos Water Planning Region

Waterbody Name [a] (basin, segment)	Assessment Unit ID	Affected Reach (miles [b])	Probable Sources of Pollutant	Uses Not Fully Supported [c]	Specific Pollutant	IR Category [d]
Taos County (cont.)						
Rio Santa Barbara (non-pueblo Embudo Ck to USFS bnd)	NM-2120.A_419	4.2	Livestock (grazing or feeding operations) On-site treatment systems (septic) Source unknown Wastes from pets Impervious surface/parking lot runoff Road/bridge runoff Inappropriate waste disposal Rangeland grazing Rural (residential areas)	HQColdWAL PC	Escherichia coli Temperature, water	5/5A
Romero Lake	NM-2120.B_05	2 [e]	Not assessed	—	—	3/3A
Serpent Lake	NM-2120.B_95	0.5 [e]	Not assessed	—	—	3/3A
South Fork Lake	NM-2120.B_58	0.6 [e]	Not assessed	—	—	3/3A
South Fork Rio Hondo (Rio Hondo to headwaters)	NM-2120.A_608	4.15	Not assessed	—	—	3/3A
Tienditas Creek (R Fernando de Taos to headwaters)	NM-2120.A_515	4.78	Not assessed	—	—	3/3A
Unnamed Arroyo (Rio Pueblo de Taos to Taos WWTP)	NM-99.A_005	2.32	Source unknown	WWAL	Ammonia (total) Nutrient/Eutrophication Biological indicators	5/5A
Vidal Creek (Comanche Creek to headwaters)	NM-2120.A_841	4.87	Source unknown	HQColdWAL	Temperature, water	5/5A

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
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[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

Table 5-8. Total Maximum Daily Load Status of Streams in the Taos Water Planning Region

Waterbody Name [a] (basin, segment)	Assessment Unit ID	Affected Reach (miles [b])	Probable Sources of Pollutant	Uses Not Fully Supported [c]	Specific Pollutant	IR Category [d]
Taos County (cont.)						
West Fork Red River (Red River to headwaters)	NM-2120.A_713	1.4	Not assessed	—	—	3/3A
Williams Lake	NM-2120.B_75	7.9 [e]	Not assessed	—	—	3/3A
Rio Arriba County						
Hidden Lake (Lake Hazel)	NM-2120.B_80	3.58 [e]	Not assessed	—	—	3/3A
Middle Fk Rio Santa Barbara (R Santa Barbara to headwaters)	NM-2120.A_423	4.05	Not assessed	—	—	3/3A
No Fish Lake	NM-2120.B_65	1 [e]	Not assessed	—	—	3/3A
Rio Quemado (Rio Arriba Cnty bnd to headwaters)	NM-2120.A_120	11.09	Not assessed	—	—	3/3A
San Leonardo Lake	NM-2120.B_14	3.5 [e]	Not assessed	—	—	3/3A
Trampas Lake (East)	NM-2120.B_86	2.6	Not assessed	—	—	3/3A
Trampas Lake (West)	NM-2120.B_85	2.6	Not assessed	—	—	3/3A

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
HQColdWAL = High quality coldwater aquatic life
MCWAL = Marginal coldwater aquatic life
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[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

Table 5-8. Total Maximum Daily Load Status of Streams in the Taos Water Planning Region

[d] Impairment (IR) categories are determined for each assessment unit (AU) by combining individual designated use support decisions.

The applicable unique assessment categories for New Mexico (NMED, 2013b) are described as follows:

Category 3: No reliable monitored data and/or information to determine if any designated or existing use is attained. AUs are listed in this category where data to support an attainment determination for any use are not available, consistent with requirements of the assessment and listing methodology.

Category 3A: Limited data (n = 0 to 1) available, no exceedences. AUs are listed in this subcategory when there are no exceedences in the limited data set. These are considered low priority for follow up monitoring (NMED, 2013).

Category 4A: Impaired for one or more designated uses, but does not require development of a TMDL because TMDL has been completed. AUs are listed in this subcategory once all TMDL(s) have been developed and approved by USEPA that, when implemented, are expected to result in full attainment of the standard. Where more than one pollutant is associated with the impairment of an AU, the AU remains in IR Category 5A (see below) until all TMDLs for each pollutant have been completed and approved by USEPA.

Category 4C: Impaired for one or more designated uses but does not require development of a TMDL because impairment is not caused by a pollutant. AUs are listed in this subcategory if a pollutant does not cause the impairment. For example the U.S. Environmental Protection Agency (EPA) considers flow alteration to be “pollution” vs. a “pollutant.”

Category 5A: Impaired for one or more designated or existing uses and a TMDL is underway or scheduled. AUs are listed in this category if the AU is impaired for one or more designated uses by a pollutant. Where more than one pollutant is associated with the impairment of a single AU, the AU remains in Category 5A until TMDLs for all pollutants have been completed and approved by U.S. EPA.

Category 5C: Impaired for one or more designated or existing uses and additional data will be collected before a TMDL is scheduled. AUs are listed in this category if there are not enough data to determine the pollutant of concern or there are not adequate data to develop a TMDL. For example, AUs with biological impairment will be listed in this category until further research can determine the particular pollutant(s) of concern. When the pollutant(s) are determined, the AU will be moved to Category 5A and a TMDL will be scheduled. If it is determined that the current designated uses are inappropriate, it will be moved to Category 5B and a UAA will be developed. If it is determined that “pollution” is causing the impairment (vs. a “pollutant”), the AU will be moved to Category 4C.

5.4.1.1 Municipal and Industrial Sources

As discussed in Section 4.2.2, a person or facility that discharges a pollutant from a point source to a surface water that is a water of the United States must obtain an NPDES permit. An NPDES permit must assure compliance with the New Mexico Water Quality Standards. A person or facility that discharges contaminants that may move into groundwater must obtain a groundwater discharge permit from the New Mexico Environment Department. A groundwater discharge permit ensures compliance with New Mexico groundwater quality standards. The NMWQCC regulations also require abatement of groundwater contamination that exceeds standards.

NPDES-permitted discharges in the planning region are summarized in Table 5-9 and shown on Figure 5-14; details regarding NPDES permits in New Mexico are available on the NMED's website (http://www.nmenv.state.nm.us/swqb/Permits/). The permitted discharges in the Taos Region include three public wastewater treatment plants, one fish hatchery, and the Chevron mine along the Red River.

A summary list of current groundwater discharge permits in the planning region is provided in Table 5-10; their locations are shown in Figure 5-14. Details indicating the status, waste type, and treatment for discharge permits for industrial and domestic waste can be obtained from the NMED Ground Water Quality Bureau website (https://www.env.nm.gov/gwb/NMED-GWQB-PollutionPrevention.htm#PPSlist).

5.4.1.2 Remediation Sites

One site in the region is listed by the U.S. Environmental Protection Agency (EPA) (2014a) as a Superfund site (Table 5-11). The Chevron Questa Mine, formally known as the Molycorp Mine, is located along the Red River, between the Village of Questa and the Town of Red River. Both open pit and underground mining have occurred at the mine since the 1920s. The site includes the former mine and milling operations and multiple tailing ponds. The mine was placed on the National Priorities (Superfund) list in 2000. In 2012, the EPA and Chevron Mining Inc. (CMI) signed two administrative orders of consent (AOCs) The first one was for the cleanup of soil contaminated by polychlorinated biphenyls (PCBs), removal of historical tailing spill deposits along the Red River, and the diversion of irrigation return flows around the tailing waste (U.S. EPA, 2014b). The second AOC was for procedures and technical analyses to produce a detailed set of plans and specifications for implementation of portions of the remedial action selected in U.S. EPA's Record of Decision for the Chevron Questa Mine site (U.S. EPA, 2014b). The mine closed in 2014, but cleanup activities will continue.

Sites undergoing investigation or cleanup pursuant to other federal authorities or state authority can be found on the EPA website (https://www.epa.gov/superfund/national-priorities-list-npl-sites-state#NM).

Table 5-9. Municipal and Industrial NPDES Permittees in the Taos Water Planning Region

Permit No	Municipality/Industry [a]	Permit Type [b]
Taos County		
NM0022306	Chevron Mining, Inc./Questa Mine [c]	Mine (non-coal)
NM0030147	NMG&FD/Red River Fish Hatchery	Fish hatchery
NM0024899	Red River, Town of/WWTP	Municipal (POTW)
NM0022101	Taos Ski Valley, Village of [c]	Municipal (POTW)
NM0024066	Taos, Town of WWTP [c]	Municipal (POTW)

Source: NMED, 2016c

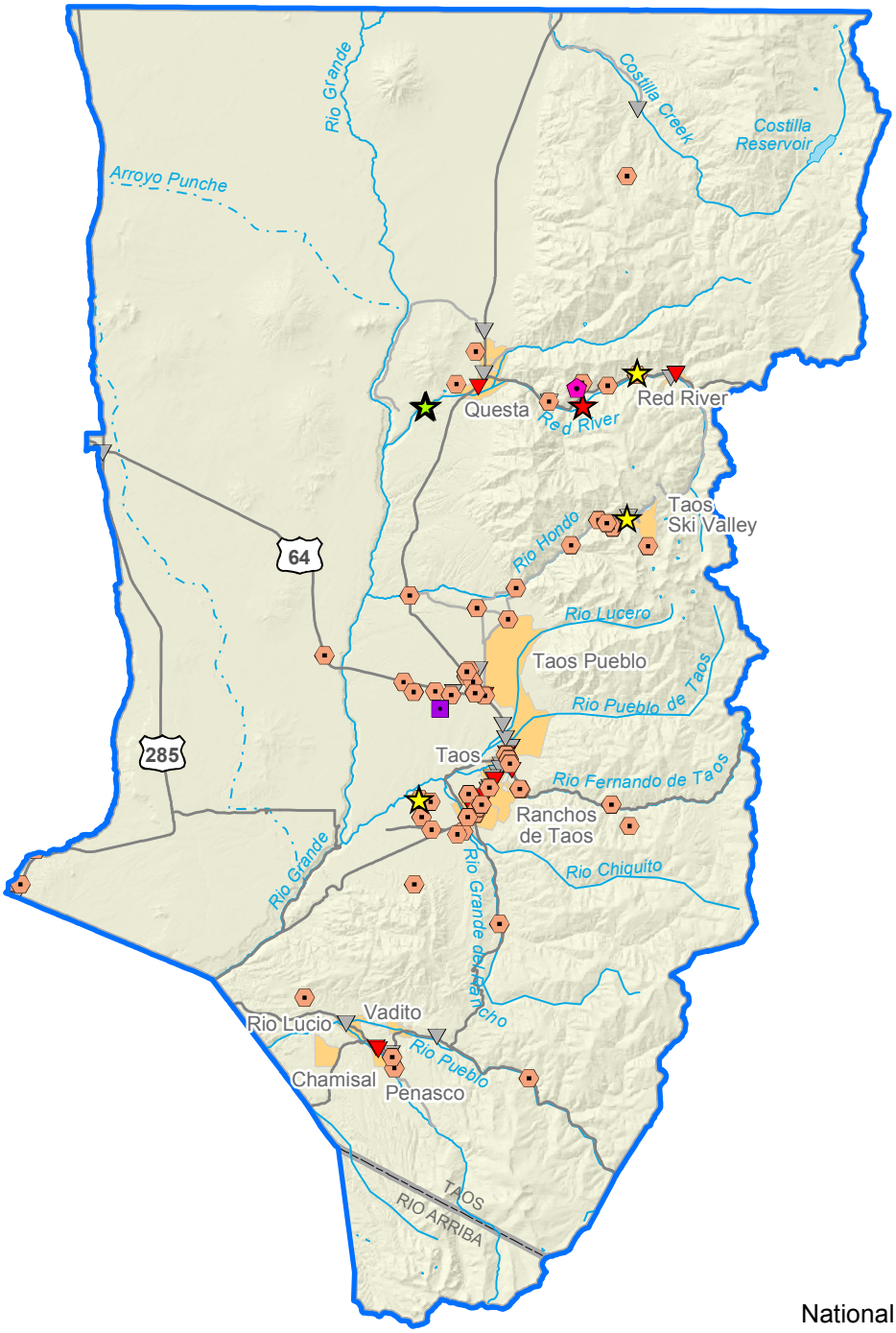
[a] Names appear as listed in the NMED database.

[b] Facilities and activities covered under the 2015 U.S. EPA NPDES Multi-Sector General Permit (MSGP) for Stormwater Discharges Associated with Industrial Activity (e.g., mining, timber products, scrap recycling facilities, as listed in Appendix D of the MSGP [U.S. EPA, 2015]) are not included due to the large number of facilities.

[c] Major discharger, classified as such by the Regional Administrator, or in the case of approved state programs, the Regional Administrator in conjunction with the State Director. Major municipal dischargers include all facilities with design flows of greater than 1 million gallons per day and facilities with U.S. EPA/State approved industrial pretreatment programs. Major industrial facilities are determined based on specific ratings criteria developed by U.S. EPA/State.

NPDES = National Pollutant Discharge and Elimination System
NMG&FD = New Mexico Game and Fish
WWTP = Wastewater treatment plant
POTW = Publicly owned treatment works
U.S. EPA = U.S. Environmental Protection Agency

Sources:
NMED, 2014b
NMED, 2015a
NMED, 2015b
NMED et al., 2016
NMED, 2016a
NMED, 2016b
NMED, 2016c
U.S. EPA, 2013
U.S. EPA, 2016a
U.S. EPA, 2016b



Explanation

- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

Leaking underground storage tank site
- Active
- No further action

- Superfund site
- Groundwater discharge permit
- Permitted active landfill
- Closed landfill

National Pollutant Discharge Elimination System (NPDES) permit
- Mine
- Fish hatchery
- Municipal (publicly owned treatment work)

N

0 5 10 Miles

TAOS
REGIONAL WATER PLAN 2016
Potential Sources of Contamination

Figure 5-14

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Table 5-10. Groundwater Discharge Permits in the Taos Water Planning Region

County	Facility Name [a]	Permit No.	Status [b]	Permitted Discharge Amount (gpd)
Taos	Abominable Snowmansion	DP-1406	Active	3,650
	Arroyos Del Norte Elementary School	DP-1180	Active	5,000
	Austing Haus Bed & Breakfast	DP-110	Active	6,000
	Cohnsville Trailer Court	DP-1434	Active	4,375
	Faustin Gonzales Mobile Home	DP-1145	Active	6,000
	Hacienda De Valdez Condominiums	DP-1363	Active	5,550
	Las Colonias Mobile Home Park	DP-429	Active	7,200
	Midtown Market and Spirits	DP-1719	Active	3,000
	Mountain View Groceries & Gas	DP-1488	Active	3,000
	Ojo Caliente Mineral Springs	DP-1378	Active	30,000
	Old Martina's Hall	DP-1764	Active	3,000
	Pagosa Mobile Home Park	DP-1782	Active	4,000
	Penasco Schools	DP-731	Active	9,999
	Questa Mine	DP-1539	Active	24
	Questa Mine	DP-132	Active	7,045
	Questa Mine	DP-1055	Active	0
	Questa Mine	DP-933	Active	12,960,000
	Red River (Town of) - Wastewater Treatment Plant	DP-268	Active	9,000

Source: NMED, 2014b, 2016b, NMED et al., 2016

gpd = Gallons per day

[a] Names appear as listed in the NMED database.

— = Not listed on GWQB web site

[b] Facilities with an NMED-designated status of active or pending are shown. Inactive facilities are not included; they can be identified on the NMED website.

Table 5-10. Groundwater Discharge Permits in the Taos Water Planning Region

County	Facility Name [a]	Permit No.	Status [b]	Permitted Discharge Amount (gpd)
Taos (cont.)	Rio Lucio Septic Service	DP-748	Active	2,001
	S and R Septic Service	DP-465	Active	9,857
	Sanchez Mobile Home Park	DP-1063	Active	5,000
	Shady Brook Village	DP-1613	Active	8,000
	Singing River Ranch	DP-1590	Pending	—
	Sipapu Ski Area	DP-883	Active	40,000
	Ski Rio	DP-367	Active	5,000
	SMU in Taos - Fort Burgwin	DP-1473	Active	17,325
	Taos (County of) - Housing Authority	DP-1033	Active	6,000
	Taos (Town of) - Wastewater Treatment Plant	DP-232	Active	2,000,000
	Taos Country Club	DP-805	Active	750,000
	Taos East Condominium Association	DP-1760	Active	3,150
	Taos Junction Mobile Home Park	DP-1607	Active	4,050
	Taos Ridge Condominiums Association Inc.	DP-1143	Active	4,500
	Taos Trial Inn	DP-1756	Active	2,650
	The Inn at Taos Valley	DP-1435	Active	2,600

Source: NMED, 2014b, 2016b, NMED et al., 2016

gpd = Gallons per day

[a] Names appear as listed in the NMED database.

— = Not listed on GWQB web site

[b] Facilities with an NMED-designated status of active or pending are shown. Inactive facilities are not included; they can be identified on the NMED website.

Table 5-11. Superfund Sites in the Taos Water Planning Region

Site Location	Site Name [a]	Site ID	EPA ID	Status [b]
Taos County				
Questa, NM	Chevron Questa Mine (Molycorp Inc. Mine)	NMD002899094	600806	NPL

Source: U.S. EPA, 2016a, 2016b

[a] Names appear as listed in the NMED database.

[b] NPL = National Priorities List

5.4.1.3 Leaking Underground Storage Tanks

Leaking underground storage tank (UST) sites present a potential threat to groundwater, and the NMED maintains a database of registered USTs. Many of the facilities included in the UST database are not leaking, and even leaking USTs may not necessarily have resulted in groundwater contamination or water supply well impacts. These USTs could, however, potentially impact groundwater quality in and near the population centers in the future. UST sites in the Taos region are identified on Figure 5-14. Active UST sites are located near Red River, Questa, Taos, and Peñasco. Many of the UST sites listed in the NMED database require no further action and are not likely to pose a water quality threat. Sites that are being investigated or cleaned up by the state or a responsible party, as identified on Table 5-12, should be monitored for their potential impact on water resources. Additional details regarding any groundwater impacts and the status of site investigation and cleanup efforts for individual sites can be obtained from the NMED database, which is accessible on the NMED website (https://www.env.nm.gov/ust/lists.html).

5.4.1.4 Landfills

Landfills used for disposal of municipal and industrial solid waste contain a variety of potential contaminants that may impact groundwater quality. Landfills operated since 1989 are regulated under the New Mexico Solid Waste Management Regulations. Many small landfills throughout New Mexico closed before the1989 regulatory enactment to avoid more stringent final closure requirements. One operating landfill is present in the planning region (Table 5-13, Figure 5-14).

5.4.1.5 Nonpoint Sources

As noted above, a primary water quality concern in the planning region is groundwater contamination due to septic tanks. In areas with shallow water tables, septic system discharges can percolate rapidly to the underlying aquifer and increase concentrations of (NMWQCC, 2002):

- Total dissolved solids (TDS)
- Iron, manganese, and sulfides (anoxic contamination)

Table 5-12. Leaking Underground Storage Tank Sites in the Taos Water Planning Region

City [a]	Release/Facility Name [b,c]	Release ID	Facility ID	Physical Address [c]	Status [d]
Taos County					
Questa	Molycorp AST Tank Farm	4054	29444	3.5 Miles E of Questa on Sr 38	Referred to Ground Water Quality Bureau
	Western Bank	506	1701	Po Box 304	Investigation, Responsible Party
Red River	Chevron Red Rvr	388	30177	Main St	Cleanup, State Lead with CAF
El Prado	Montoya Well	355	29490	1629 Hwy 522	Aggr Cleanup Completed, St Lead, CAF
Taos	Southside Texaco	2276	30690	823 Paseo Del Pueblo Sur	Cleanup, Responsible Party
	Canon 66 Service Station	3676	27209	526 Kit Carson Rd	Pre-Investigation, Confirmed Release
	Previously Richwall Conoco Car Washes	4660	27305	1351 Paseo Del Pueblo Sur	Investigation, Responsible Party
	R And R Shamrock - No62, Taos	4421	30115	1332 Paseo Del Pueblo Sur	Aggr Cleanup Completed, Resp Party
	Exxon Taos	56	30153	Armory And Pueblo	Referred to Ground Water Quality Bureau
	Robinson Texaco	421	30278	217 Paseo Del Pueblo Sur	Aggr Cleanup Completed, St Lead, CAF
	Southside Texaco	4445	30690	823 Paseo del Pueblo Sur	Cleanup, Responsible Party
Ranchos de Taos	Giant Dba Mustang 7297	4703	31842	5180 Hwy 68	Investigation, Responsible Party
Carson	Shuree Ponds	3041	30594	Valle Vidal Unit	Referred to Ground Water Quality Bureau
Peñasco	A1 Auto Repair	764	26305	14122 NM 75	Aggr Cleanup Completed, Resp Party
	Travelers Service Station	3067	31185	14111 Hwy 75	Aggr Cleanup Completed, Resp Party

Source: NMED, 2014b, 2016a, NMED et al., 2016

[a] Determined according to latitude/longitude information in NMED database. In some cases this information was inconsistent with the facility address, and where such an inconsistency was identified, county and city were instead determined based on the facility address.

[b] Sites with No Further Action status (release considered mitigated) are not included. Information regarding such sites can be found on the NMED website (http://www.nmenv.state.nm.us/ust/lists.html

[c] Information appears as listed in the NMED database.

[d] Pre-Investigation, Suspected Release: Release not confirmed by definition
Pre-Investigation, Confirmed Release: Confirmed release as by definition
Investigation: Ongoing assessment of environmental impact
Cleanup: Physical removal of contamination ongoing
Aggressive Cleanup Completed (Aggr Cleanup Completed): Effective removal of contamination complete
Responsible Party (Resp Party): Owner/Operator responsible for mitigation of release
State Lead: State has assumed responsibility for mitigation of release
Federal Facility: Responsibility under the Federal Govt
CAF: Corrective action fund

- Nitrate
- Potentially toxic organic chemicals
- Bacteria, viruses, and parasites (microbiological contamination)

Because septic systems are generally spread out over rural areas, they are considered a nonpoint source. Collectively, septic tanks and other on-site domestic wastewater disposal systems constitute the single largest known source of groundwater contamination in New Mexico (NMWQCC, 2002), with many of these occurrences in areas with shallow water tables.

Table 5-13. Landfills in the Taos Water Planning Region

County	Landfill Name [a]	Landfill Operating Status	Landfill Closure Date
Taos	Taos Regional	Open	NA

Source: NMED, 2014b, 2015a, 2015b; DBS&A, 2008 NA = Not applicable
[a] Names appear as listed in the NMED database.

Elevated uranium in wells in the Rio Ojo Caliente area and south of the Rio Hondo emanating from natural sources (Benson and Gervason, 2013; Benson et al., 2014) represents a nonpoint source. To address this issue, continued monitoring to understand where elevated levels are occurring is warranted, and simple filters for domestic wells or treatment systems for community wells may be used to mitigate health effects.

Other nonpoint sources of pollutants that are concerns for surface water quality in the planning region include wildfires, grazing, agriculture, recreation, hydromodification, streambank destabilization/modification, removal of riparian vegetation, road and highway maintenance, silvicultural activities, land disposal, resource extraction, road runoff, and natural and unknown sources.

One approach to addressing nonpoint source pollution is through Watershed Based Planning or other watershed restoration initiatives that seek to restore riparian health and to address sources of contamination. NMED encourages cooperative planning efforts in watersheds where TMDLS are established (https://www.env.nm.gov/swqb/wps/WBP/index.html). In the Taos region, the original water plan identified several watershed restoration planning efforts, including Comanche Creek, Red River, San Cristobal, Rio Hondo, Rio Don Fernando, Rio Pueblo de Taos, and the Rancho de Taos section of the Upper Rio Grande. Since the accepted plan was published, additional watershed planning and restoration efforts have been undertaken for Embudo Creek (Environmental Health Consultants and NMED, 2007/2010).

The River Ecosystem Restoration Initiative (RERI) Program provides funding to restore instream ecosystem and watershed health in New Mexico. Two projects have recently been completed in the Taos Region: one restoring the Rio Pueblo de Taos and the other restoring the Rio Ojo Caliente (NMED, 2013b).

Nonpoint source management in New Mexico is conducted under NMED guidance. The goal of the NMED program is to meet and maintain designated uses of surface and groundwater resources in New Mexico using a watershed based approach and with substantial stakeholder involvement (NMED, 2014d).

5.5 Administrative Water Supply

The *Handbook* describes a common technical approach (referred to there as a *platform)* for analyzing the water supply in all 16 water planning regions in a consistent manner. As discussed in the Handbook (NMISC, 2013), many methods can be used to account for supply and demand, but some of the tools for implementing these analyses are available for only parts of New Mexico, and resources for developing them for all regions are not currently available. Therefore, the State has developed a simple method that can be used consistently across all regions to assess supply and demand for planning purposes. The use of this consistent method will facilitate efficient development of a statewide overview of the balance between supply and demand in both normal and drought conditions, so that the State can move forward with planning and funding water projects and programs that will address the regions' and State's pressing water issues.

The method to estimate the available supply, referred to as the *administrative water supply in the Handbook*, is based on withdrawals of water as reported in the *New Mexico Water Use by Categories 2010* report, which provide a measure of supply that considers both physical supply and legal restrictions (i.e., the water is physically available, and its use is in compliance with water rights policies) and thus reflects the amount of water available for use by a region. An estimate of supply during future droughts is also developed by adjusting the 2010 withdrawal data based on physical supplies available during historical droughts, as discussed in Section 5.5.2.

5.5.1 2010 Administrative Water Supply

The administrative water supply (i.e., total withdrawals) in 2010 for the Taos region, as reported in the *New Mexico Water Use by Categories 2010* report (Longworth et al., 2013), was 120,511 acre-feet. Of this total, 96,710 acre-feet were surface water withdrawals and 23,801 acre-feet were groundwater. The breakdown of these withdrawals among the various categories of use detailed in the *New Mexico Water Use by Categories 2010 report* is discussed in Section 6.1. The largest sector of use of the administrative water supply is irrigated agriculture, followed by commercial, mining, and then public water supply.

5.5.2 Drought Supply

The variability in surface water supply from year to year is a better indicator of how vulnerable a planning region is to drought in any given year or multi-year period than is the use of long-term averages. As discussed in Section 5.1.1, the PDSI is an indicator of whether drought conditions exist and if so, what the relative severity of those conditions is. For Climate Division 2, which covers the entire Taos region, the PDSI classification for 2010 was near normal. Given that the water use data for 2010 represent a normal year, it cannot be assumed that this supply will be available in all years; it is important that the region also consider potential water supplies during drought periods.

There is no established method or single correct way of quantifying a drought supply given the complexity associated with varying levels of drought and constantly fluctuating water supplies. For purposes of having an estimate of drought supplies for regional and statewide water planning, the State has developed and applied a method for regions with both stream-connected and non-stream-connected aquifers. The method adopted for stream-connected aquifers is described below:

- The drought adjustment is applied only to the portion of the administrative water supply that derives from surface water, as it is assumed that groundwater supplies will be available during drought due to the relatively stable thicknesses of groundwater aquifers that are continuously recharged through their connection to streams. While individual wells may be depleted due to long-term drought, this drought adjustment does not include an evaluation of diminished groundwater supplies. Surface water provides about 80 percent of the water supply in the Taos region, and thus the region is particularly vulnerable to drought.

- The minimum annual yield for key stream gages on mainstem drainages (Table 5-4b) was compared to the 2010 yield, and the gage with the lowest ratio of minimum annual yield to 2010 yield was selected.

- The 2010 administrative surface water supply for the region was then multiplied by that lowest ratio to provide an estimate of the surface water supply adjusted for the maximum drought year of record.

For the Taos region, the gage with the minimum ratio of annual yield to 2010 yield is the Rio Pueblo de Taos near Taos, with a ratio of 0.14 for minimum annual yield (3,526 acre-feet in 2002) to 2010 yield (25,411 acre-feet) (USGS, 2014c). Based on the region's total administrative surface water supply of 96,710 acre-feet (Section 5.5.1), the drought-adjusted surface water supply is 13,539 acre-feet. With the 23,802 acre-feet of groundwater supply, the total drought supply is 37,341 acre-feet, or about 31 percent of a normal year administrative water supply.

Though the adjustment is based on the minimum year of streamflow recorded to date, it is possible that drought supplies could be even lower in the future. Additionally, water supplies downstream of reservoirs may be mitigated by reservoir releases in early drought phases, while longer-term droughts can potentially have greater consequences. This approach does not evaluate mitigating influences of reservoir storage in early phases of a drought when storage is available (although in the Taos region most of the surface water supply from the tributaries of the Rio Grande does not benefit from reservoir storage), or potential development of new groundwater supplies. Despite these uncertainties, the adjusted drought supply provides a rough estimate of supply during a severe to extreme drought year.

6. Water Demand

To effectively plan for meeting future water resource needs, it is important to understand current use trends as well as future changes that may be anticipated. This section includes a summary of current water use by category (Section 6.1), an evaluation of population and economic trends and projections of future population (Sections 6.2 and 6.3), a discussion of the approach used to incorporate water conservation in projecting future demand (Section 6.4), and projections of future water demand (Section 6.5).

Four terms frequently used when discussing water throughout this plan have specific definitions related to this RWP:

- *Water use* is water withdrawn from a surface or groundwater source for a specific use. In New Mexico water is accounted for as one of the nine categories of use in the *New Mexico Water Use by Categories 2010* report prepared by the NMOSE.
- *Water withdrawal* is water diverted or removed from a surface or groundwater source for use.
- *Administrative water supply* is the amount of water withdrawals in 2010 as outlined in the *New Mexico Water Use by Categories 2010* report.
- *Water demand* is the amount of water needed at a specified time.

6.1 Present Uses

The most recent assessment of water use in the region was compiled by NMOSE for 2010, as discussed in Section 5.5. The *New Mexico Water Use by Categories 2010* (Longworth et al., 2013) provides information on total withdrawals for nine categories of water use:

- Public water supply
- Domestic (self-supplied)
- Irrigated agriculture
- Livestock (self-supplied)

- Commercial (self-supplied)
- Industrial (self-supplied)
- Mining (self-supplied)
- Power (self-supplied)
- Reservoir evaporation.

The total surface water and groundwater withdrawals for each category of use, for each county, and for the entire region, are shown on Table 6-1 and Figure6-1a through 6-1d.

The predominant surface water use in 2010 in the Taos region was for irrigated agriculture. The Town of Red River and Taos Ski Valley also divert surface water for snow making at the ski areas.

Groundwater accounts for 20 percent of the total withdrawals in the region. Most of the groundwater use in the Taos region is for commercial and mining use, although the Chevron mine in Questa closed in 2014, which will impact future demands (Section 6.5.2). The primary commercial use is for the Red River Fish Hatchery. Groundwater also supplies public water systems and domestic wells in the region. Groundwater points of diversion are shown in Figure 6-2.

The categories included in the *New Mexico Water Use by Categories 2010* report and shown on Figure 6-1 and Table 6-1 represent the total withdrawals in the planning region. Tribes and Pueblos in New Mexico are not required to provide water use data to the State; therefore, tribal water use data are not necessarily reflected in this plan. There are also some unquantified additional categories of water use, including riparian evapotranspiration and instream flow.

- *Riparian evapotranspiration:* Some research and estimates have been made for riparian evapotranspiration in selected areas, such as along the middle and lower Rio Grande (Thibault and Dahm, 2011; Coonrod and McDonnell, Undated; Bawazir et al., 2009), but riparian evapotranspiration has not been quantified statewide. The New Mexico Water Resources Research Institute is currently developing those estimates, but the results are not yet available. Though riparian evapotranspiration is anticipated to consume a relatively large quantity of water statewide, it will not affect the calculation of the gap between supply and demand using the method in this report, because the gap reflects the difference between future anticipated demands and present uses, and if both present and future uses do not include the riparian evapotranspiration category, then the difference will not be affected. The only impact to the gap calculation would be if evapotranspiration significantly changes in the future. There is potential for such a change due to warming temperatures, but anticipated changes have not been quantified and would be subject to considerable uncertainty. Anticipated changes in riparian and stream evapotranspiration are areas that should be considered in future regional and state water plan updates.

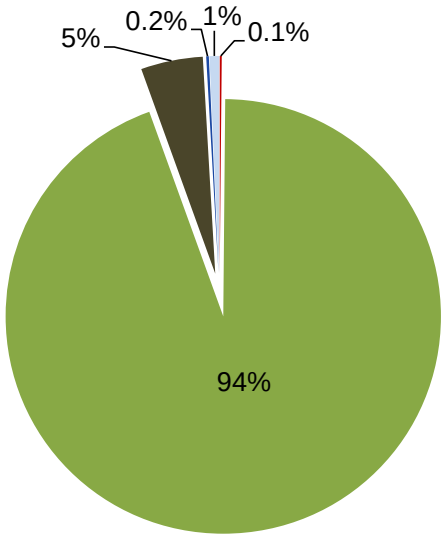
Table 6-1. Total Withdrawals in the Taos Water Planning Region in 2010

Water Use Category	Withdrawals (acre-feet) [a]								
	Taos County			Rio Arriba County			Planning Region		
	Surface Water	Ground-water	Total	Surface Water	Ground-water	Total	Surface Water	Ground-water	Total
Commercial (self-supplied)	144	12,470	12,614	0	0	0	144	12,470	12,614
Domestic (self-supplied)	0	1,143	1,143	0	1	1	0	1,144	1,144
Industrial (self-supplied)	0	0	0	0	0	0	0	0	0
Irrigated agriculture	91,065	1,218	92,283	122	1	123	91,187	1,219	92,406
Livestock (self-supplied)	46	66	112	1	1	3	47	68	115
Mining (self-supplied)	4,458	6,804	11,262	0	0	0	4,458	6,804	11,262
Power (self-supplied)	0	0	0	0	0	0	0	0	0
Public water supply	187	2,097	2,284	0	0	0	187	2,097	2,284
Reservoir evaporation	686	0	686	0	0	0	686	0	686
Total	96,586	23,799	120,385	123	3	126	96,710	23,802	120,511

Source: Longworth et al., 2013

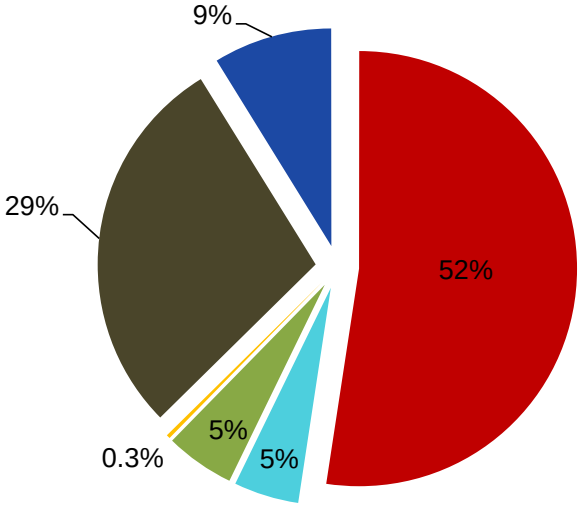
[a] Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this table.

Surface Water



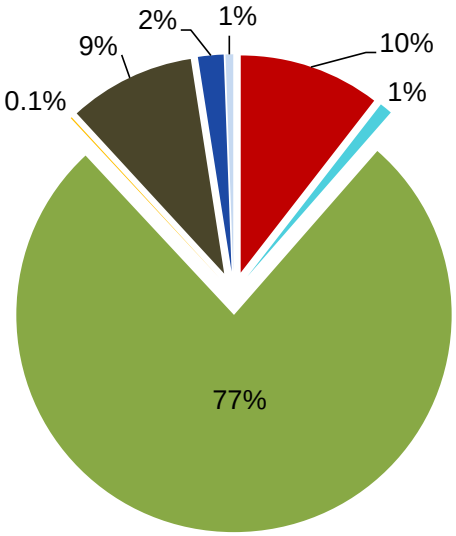
Total usage: 96,586 acre-feet

Groundwater



Total usage: 23,799 acre-feet

Total



Total usage: 120,385 acre-feet

Explanation

- Commercial (self-supplied)
- Domestic (self-supplied)
- Industrial (self-supplied)
- Irrigated agriculture
- Livestock (self-supplied)
- Mining (self-supplied)
- Power (self-supplied)
- Public water supply
- Reservoir evaporation

Source: Longworth et al., 2013

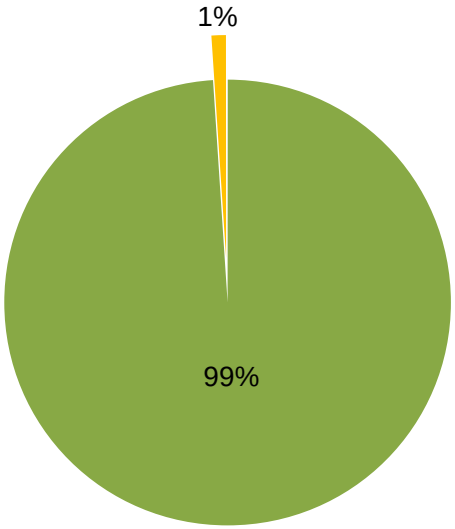
Notes:
1. Only categories with usage above 0.1% are shown.
2. Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

Figure 6-1a

TAOS
REGIONAL WATER PLAN 2016

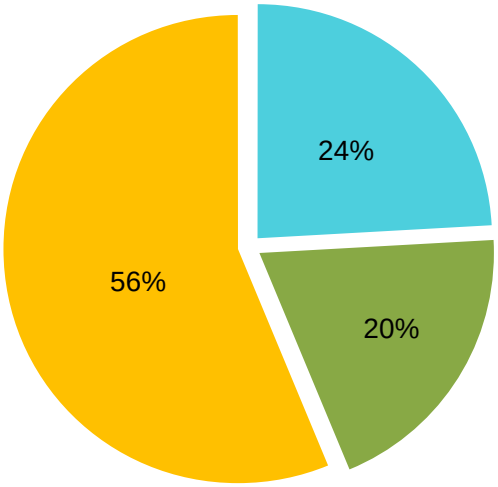
Taos County Water Demand, 2010

Surface Water



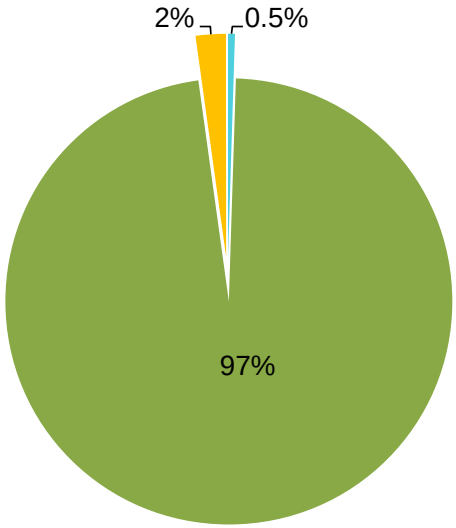
Total usage: 123 acre-feet

Groundwater



Total usage: 3 acre-feet

Total



Total usage: 126 acre-feet

Explanation

- Commercial (self-supplied)
- Domestic (self-supplied)
- Industrial (self-supplied)
- Irrigated agriculture
- Livestock (self-supplied)
- Mining (self-supplied)
- Power (self-supplied)
- Public water supply
- Reservoir evaporation

Source: Longworth et al., 2013

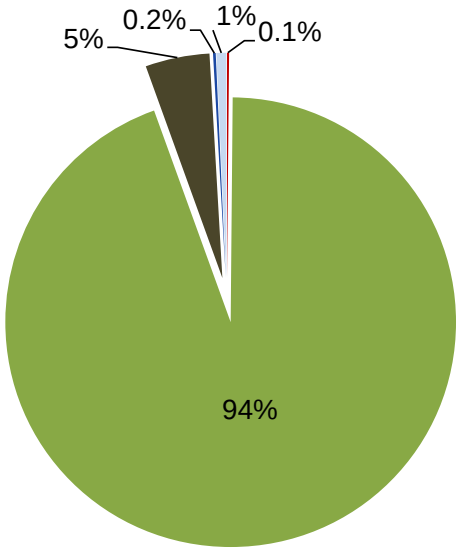
Notes:
1. Only categories with usage above 0.1% are shown.
2. Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

Figure 6-1b

TAOS
REGIONAL WATER PLAN 2016

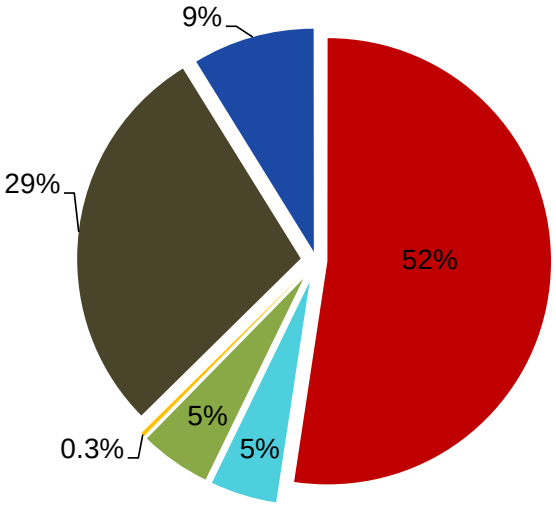
Rio Arriba County Water Demand, 2010

Surface Water



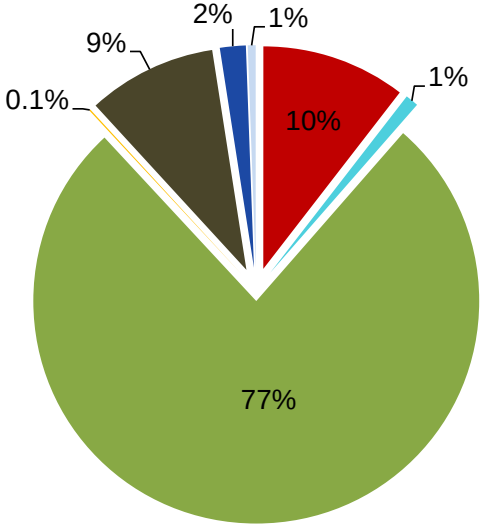
Total usage: 96,710 acre-feet

Groundwater



Total usage: 23,802 acre-feet

Total



Total usage: 120,511 acre-feet

Explanation

- Commercial (self-supplied)
- Domestic (self-supplied)
- Industrial (self-supplied)
- Irrigated agriculture
- Livestock (self-supplied)
- Mining (self-supplied)
- Power (self-supplied)
- Public water supply
- Reservoir evaporation

Source: Longworth et al., 2013

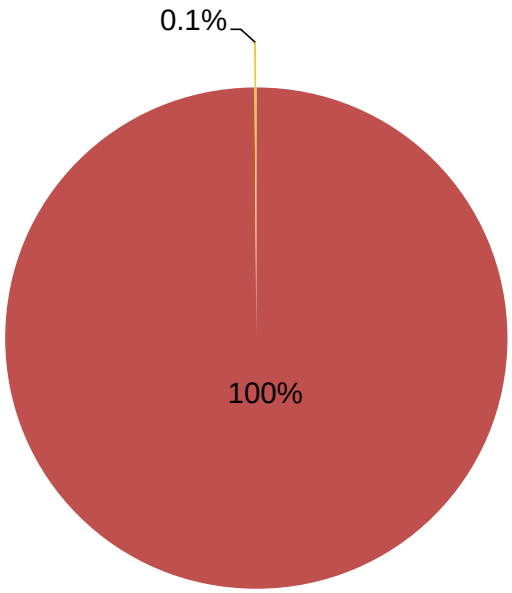
Notes:
1. Only categories with usage above 0.1% are shown.
2. Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

TAOS
REGIONAL WATER PLAN 2016

Total Regional Water Demand by Sector, 2010

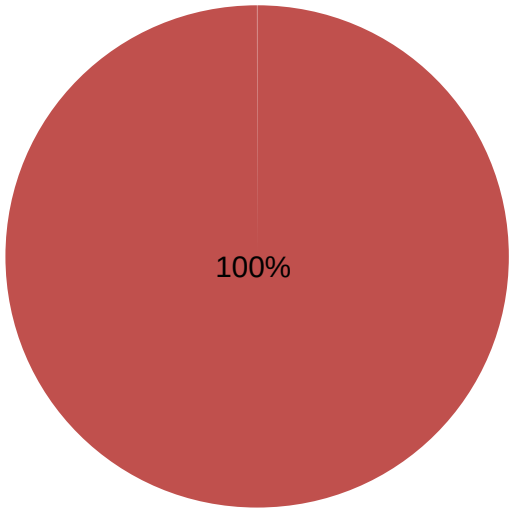
Figure 6-1c

Surface Water



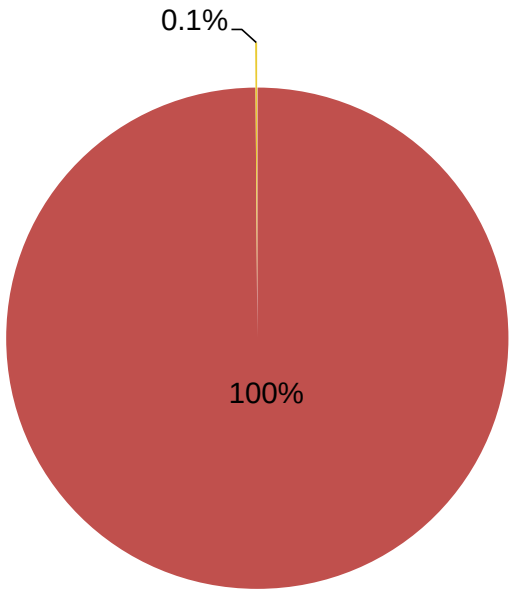
Total usage: 96,710 acre-feet

Groundwater



Total usage: 23,802 acre-feet

Total



Total usage: 120,511 acre-feet

Explanation

- Taos
- Rio Arriba

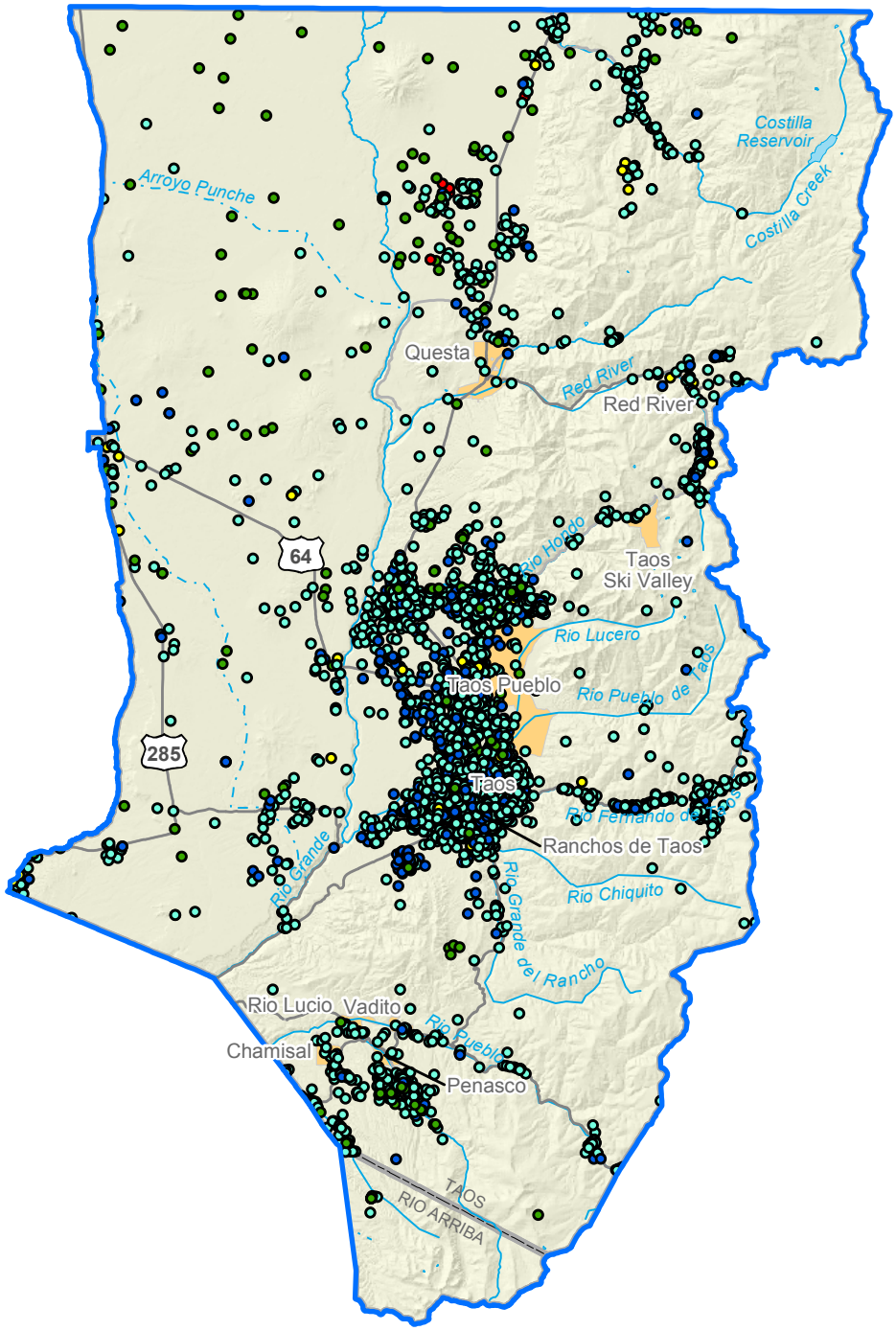
Source: Longworth et al., 2013

Notes:
1. Only categories with usage above 0.1% are shown.
2. Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

Figure 6-1d

TAOS
REGIONAL WATER PLAN 2016

Total Regional Water Demand by County, 2010



Explanation

- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

Well (use)

- Agriculture/irrigation
- Commercial/industrial/recreation
- Domestic
- Mining/oil/gas
- Public water supply

N

0 5 10 Miles

Source: NMOSE, 2014d

TAOS
REGIONAL WATER PLAN 2016
Groundwater Points of Diversion

Figure 6-2

S:\PROJECTS\WR12.0165_STATE_WATER_PLAN_2012\GIS\MXDS\FIGURES_2016\TAOS\FIG6-2_POINTS_OF_DIVERSION.MXD 4/28/2016

- *Instream flow:* The analysis of the gap between supply and demand relies on the largest use categories that reflect withdrawals for human use or reservoir storage that allows for withdrawals downstream upon release of the stored water. It is recognized that there is also value in preserving instream water for ecosystem and habitat and tourism purposes. Though this value has not been quantified in the supply/demand gap calculation, it may still be an important use in the region, and if the region chooses, it may recommend instream flow protections in its policy, program, and project recommendations.

In addition to the special conditions listed above, the data provided in the *New Mexico Water Use by Categories 2010* report are available for withdrawals only; depletions have not been quantified. In many cases, some portion of diverted water returns to surface or groundwater, for example from agricultural runoff or seepage or discharge from a wastewater treatment plant. In those locations where there is such return flow, the use of withdrawal data for planning purposes will add a margin of safety; thus the use of withdrawal data is a conservative approach for planning purposes.

6.2 Demographic and Economic Trends

To project future water demands in the region, it is important to first understand demographics, including population growth and economic and land use trends as detailed below. This information was used to project population, economic growth, and future water demand, as presented in Sections 6.3 and 6.5. The economic information provided in this section was obtained primarily from telephone interviews with government officials and other parties with knowledge of demographic and economic trends; the list of interviewees is provided in Appendix 6-A. The information provided in this section was used to project population, economic growth, and future water demand, as presented in Sections 6.3 and 6.5.

Taos County experienced relatively steady growth from 1960 to 2010, with the population doubling over that period, from 15,934 to 32,937. Since 2010, there has been virtually no growth; the population in 2013 was estimated to be 33,035 (U.S. Census Bureau, 2014a), although with part-time residents, the population may be closer to 50,000. A small portion of Rio Arriba County is also included in the Taos Water Planning Region. In 2010, seven people were living in the Rio Arriba portion of the region.

The economy of Taos County has traditionally been driven by tourism and mining (at the Chevron mine near Questa). The largest employment categories are tourism-related services (arts, entertainment, recreation, hospitality, food services), education/healthcare (government, schools, non-profit organizations), professional services, retail trade, and construction. Agriculture is the largest water user in the region, followed by mining, though ski areas, rafting companies, and other businesses supporting tourism are also dependent on adequate precipitation and water resources.

The Arrowhead Center at New Mexico State University (NMSU) analyzed the economy of Taos County and identified the basic industries that support the economy (Arrowhead Center, 2013). Basic industries bring outside dollars into the economy. A basic industry frequently has a location quotient (LQ) greater than 1.0, which means that its relative share of the local economy is greater than that industry's relative share of the state economy. In Taos County, the primary basic industries in 2011 were arts, entertainment, and recreation (LQ of 3.53), utilities (LQ of 1.81), accommodations and food services (LQ of 1.62), agriculture (LQ of 1.56), and real estate (LQ of 1.50). Mining, which had had an LQ of 1.54 in 2008, had declined to an LQ of 0.88 in 2011. The construction industry has been in decline since 2006, with a loss of more than half of the level of gross receipts from 2006 to 2011. As a consequence, the LQ for construction stood at 1.03 in 2011, down from 1.29 in 2007 (Arrowhead Center, 2013).

Representatives of the Town and the County concur that the recovery from the recession has been slow and that no major increases in economic activity are anticipated in the foreseeable future. The local real estate market remains slow for vacant and commercial property, and while the construction industry has stopped declining, it hasn't yet recovered. The county issued 60 residential building permits in 2012, compared with 269 in 2006. The valuation of those permits declined from $37.2 million in 2006 to $7.1 million in 2012. Also, the median home price declined for four straight years, with a slight recovery in 2012.

Many Taos residents are priced out of the housing market, which has a median home price of $238,000 compared to a median family income of about $35,000. Some cite this gap as likely one of the main reasons for the difficulty that Taos employers have in holding a quality work force. Wage and salary employment has decreased every year since 2006 and stood at $15,307 in 2013.

A positive economic note is the recent sale of Taos Ski Valley Inc. to a corporation with sufficient capital to make improvements to the ski complex. It is anticipated that 40 new lodging units will be added by 2016, 100 more by 2018, and an additional 60 to 110 by 2024. It is hoped that the additional units, along with adequate snow, will enable the ski area to increase the number of annual skier days from 215,000 in the 2013-14 season to something like the 365,000 skier days commonly reported during the early 1990s. Another new draw is the recent addition of the Kachina Peak lift, which has a capacity of 1,500 skiers per hour and has increased the lift-served acreage by 50 percent. There could also be an increase in visitor activity during the summer season, which accounts for less than 20 percent of the level of visitors seen in the winter.

Another positive development is the planned expansion of the airport, which will support growth in the tourism industry. Also, the introduction of broadband internet service by Kit Carson Co-op will be another factor supporting growth.

In 2013, an economic development action plan was created for the Town of Taos by LeapPartners. Some of the plan's recommendations include enhancing the business climate through better coordination of economic development efforts and developing an internship program for teens. The plan cites opportunities in the areas of personal care product manufacturing and gourmet food production. It recommended that there be less reliance on the tourism sector and more efforts to diversify the economy. Without such efforts, it is projected that the economy (as measured by taxable revenues) will grow by 3.44 percent over the period from 2011 to 2016. With a more focused approach to economic development, growth could reach 4.94 percent to 7.06 percent (LeapPartners, 2013).

As noted in Table 3-1d, the most valuable agricultural commodities in Taos County are cattle and calves, hay and other related crops, and aquaculture. (USDA NASS, 2014). While the number of farms and ranches increased by 54 percent, from 637 in 2007 to 983 in 2012, the amount of land in farms and ranches declined by 31 percent, from 456,932 acres to 313,414 acres. Also, during that same five-year period, the amount of irrigated land declined from 19,411 acres to 14,458 acres, a decrease of 26 percent. In 2012, the average payment to a farmer participating in agricultural support programs was $4,997, up 330 percent from 2007, with a total of $440,000 in government payments going to farmers in Taos County. The average farm had a net cash operating loss of $1,204. The average age of a farmer in 2012 was 61.9.

The drought has had a significant impact on cattle herds in Taos County. Because so little hay is available, the supply is limited and very expensive, and the rangeland is not producing much grass. Therefore ranchers have sold off a large portion of their herds. The difficult ranching conditions have discouraged people in their twenties and thirties from pursuing this livelihood, and some are leaving rural Taos County to pursue employment elsewhere. The school-age population has been declining for the past few years as persons of childbearing age leave the county.

Some farmers are turning to hoop house or greenhouse small-scale farming. These farms are being irrigated with well water and drip irrigation. The objective is to have intensive small-scale farming on ¼-acre plots to grow high value "gourmet" crops such as specialty lettuce and heirloom tomatoes that are sold to local food chains and to restaurants.

6.3 Projected Population Growth

The population projections for the 2008 Regional Water Plan (DBS&A, 2008) encompassed two forecasts, a high and a low, each covering the period from 2010 through 2050. The Bureau of Business and Economic Research (BBER) at the University of New Mexico (UNM) prepared county-level population forecasts using data and historical trends from 1960 up to the 2000 Census. BBER projections formed a basis for the forecasts in the water plan, as adjusted by information from community representatives who were interviewed.

Since 2008, the drought, the national recession that started in 2007, and dampened demand for molybdenum have resulted in population growth that was slower than anticipated. Given these changes, the 2008 water plan growth scenarios were too optimistic (Table 6-2). The BBER has continued to revise its population projections downward during the past 14 years to reflect slower growth than originally anticipated (BBER, 2008, 2012).

There was a virtual consensus among those interviewed that growth will be slow over the next decade. While the closing of the molybdenum mine is a negative factor, there is some optimism that efforts to diversify the economy in Questa will be successful.

Table 6-2. Comparison of Projected and Actual 2010 Population

County	2008 Regional Water Plan Projected Population [a]		Actual Population/ 2010 U.S. Census [b]
	High	Low	
Taos	41,208	36,647	32,937
Total Region	41,208	36,647	32,937

[a] DBS&A, 2008

[b] U.S. Census Bureau, 2014a

The Town of Red River finalized a Wastewater Treatment System Improvements Preliminary Engineering Report (developed by Dennis Engineering) in July 2014. The plan contains two scenarios for growth through 2035, one at a 0.15 percent annual growth rate and one at a 1.3 percent annual rate. The high scenario projects that the growth rate of the Town from 1980 to 2010 will continue into the future.

For the population projections through 2060 (Table 6-3), two population forecasts were developed: one based on a moderately optimistic view of the economy for this region over the long term and one that portrays a more pessimistic picture. The current (2012) BBER population projections through 2040 (Appendix 6-B) were used as a starting point for the low population projection, extrapolated through 2060. In the low forecast, the BBER growth rates were used through 2040, except that they were dampened for the 2010 to 2020 period to take into account the actual slower rate of growth that has occurred since 2010. Under the low forecast, county population will reach 38,441 in 2060. The high population projections are more optimistic and assume a full recovery from the recession and drought and an eventual return of molybdenum mining after the planned closure of the mine. Under the high forecast, the population of the county will reach 47,769 in 2060. The population projections are detailed in Table 6-3.

Table 6-3. Taos Water Planning Region Population Projections July 1, 2010 to July 1, 2060

a. Annual Growth Rate

County	Projection	Growth Rate (%)				
		2010-2020	2020-2030	2030-2040	2040-2050	2050-2060
Taos	High	1.21	0.77	0.58	0.58	0.58
	Low	0.69	0.64	0.21	0.00	0.00

b. Projected Population

County	Projection	Population					
		2010	2020	2030	2040	2050	2060
Taos	High	32,937	37,136	40,107	42,514	45,065	47,769
	Low	32,937	35,282	37,635	38,441	38,441	38,441

Source: Poster Enterprises, 2014

6.4 Water Conservation

Water conservation is often a cost-effective and easily implementable measure that a region may use to help balance supplies with demands. The State of New Mexico is committed to water conservation programs that encourage wise use of limited water resources. The Water Use and Conservation Bureau of the NMOSE developed the *New Mexico Water Conservation Planning Guide for Public Water Suppliers*. When evaluating water rights transfers or 40-year water development plans that hold water rights for future use, the NMOSE considers whether adequate conservation measures are in place. However, the 40 year water development plans are not incorporated into the RWP updates, as the resources needed to complete this work are not currently available. It is therefore important when planning for meeting future water demand to consider the potential for conservation.

To develop demand projections for the region, some simplifying assumptions regarding conservation have been made. These assumptions were made only for the purpose of developing an overview of the future supply-demand balance in the region and are not intended to guide policy regarding conservation for individual water users. The approach to considering conservation in each category of water use for developing water demand projections is discussed below. Specific recommendations for conservation programs and policies for the Taos region, as identified by the regional steering committee, are provided in Section 8.

Public water supply. Public water suppliers that have large per capita usage have a greater potential for conservation than those that are already using water more efficiently. Through a cooperative effort with seven public water suppliers, the NMOSE developed a GPCD (gallons

per capita per day) calculation to be used statewide, thereby standardizing the methods for calculating populations, defining categories of use, and analyzing use within these categories. The GPCD calculator was used to arrive at the per capita uses for public water systems in the region, shown in Table 6-4. These rates are provided to assist the regional steering committee in considering specific conservation measures.

The system-wide per capita usage for each water supplier includes uses such as golf courses, parks, and commercial enterprises that are supplied by the system. Hence there can be large variability among the systems. For purposes of developing projections, a county-wide per capita rate was calculated as the total public supply use in the county divided by the total county population (or portion of the county within the region), excluding those served by domestic wells. For future projections (Section 6.5), a consistent method is being used statewide that assumes that conservation would reduce future per capita use in each county by the following amounts:

- For current average per capita use greater than 300 gpcd, assume a reduction in future per capita use to 180 gpcd.
- For current average per capita use between 200 and 300 gpcd, assume a reduction in future per capita use to 150 gpcd.
- For current average per capita use between 130 and 200 gpcd, assume a reduction in future per capita use to 130 gpcd.
- For current average per capita use less than 130 gpcd, no reduction in future per capita use is assumed.

For the Taos region, current per capita use in Taos County is under 130 gpcd (Table 6-4), so no additional conservation is assumed. Since there are no public water systems in the Rio Arriba portion of the region, that area was not evaluated for this calculation.

Self-supplied domestic. Homeowners with private wells can achieve water savings through household conservation measures. These wells are not metered, and current water use estimates were developed based on a relatively low per capita use assumption (Table 6-4; Longworth et al., 2013). Therefore, no additional conservation savings were assumed in developing the water demand projections. For purposes of developing projections, a county-wide per capita rate was calculated as the total self-supplied domestic use in the county divided by the total county population (or portion of the county within the region), excluding those served by a public water system.

Irrigated agriculture. As the largest water use in the region, conservation in this sector may be beneficial. However, when considering the potential for improved efficiency in agricultural irrigation systems, it is important to consider how potential conservation measures may affect the region's water supply.

Table 6-4. 2010 Water Withdrawals for Drinking Water Supply Systems and Rural Self-Supplied Homes

OSE Declared Groundwater Basin(s) [a]	Water Supplier [b]	Population	Per Capita Use (gpcd)	Withdrawals (acre-feet)	
				Surface Water	Groundwater
Rio Arriba County					
Rio Grande (Northern)	Rural self-supplied homes (Rio Grande) [c]	7	80	0	1
	Rio Arriba County domestic self-supplied totals	*7*		*0*	*1*
	County-wide domestic self-supplied per capita use [d]		80		
Taos County					
Rio Grande (Northern)	Arroyo Seco MDWCA	546	38	0	23
	Canon MDWCA	591	131	0	87
	Cerro East MDWCA	250	20	0	5
	Chamisal MDWCA	550	29	0	18
	Costilla MDWCA	300	90	0	30
	Cuchilla Del Llano MDWCA	400	14	0	6
	Eagle Rock Village	81	80	0	7
	El Prado Water & Sanitation Dist.	1,008	87	0	98
	El Rancho Mobile Home Park	72	80	0	6
	El Salto MDWCA	232	62	0	16
	Enchanted Mobile Home Park	150	17	0	3
	La Lama MDWCA	80	64	0	6
	La Lomita Mobile Home Park	100	64	0	7
	Las Colonias Moblie Home Park	120	37	0	5
	Las Haciendas Homeowners WUA	72	80	0	6
	Llano Quemado MDWCA	850	38	0	36

Source: Longworth et al., 2013, unless otherwise noted.

[a] Determined based on NMED Drinking Water Bureau water supply source locations (NMOSE water use database doesn't distinguish groundwater basin).

[b] For systems supplied by surface water withdrawals, the river basin is provided in parentheses. Rural self-supplied homes are located in the river basin specified in parentheses.

[c] Portion that is in Taos Planning Region

[d] County-wide per capita use, calculated as the total population divided by total withdrawals.

gpcd = Gallons per capita per day

Table 6-4 2010 Water Withdrawals for Drinking Water Supply Systems and Rural Self-Supplied Homes

OSE Declared Groundwater Basin(s) [a]	Water Supplier [b]	Population	Per Capita Use (gpcd)	Withdrawals (acre-feet)	
				Surface Water	Groundwater
Taos County (cont.)					
Rio Grande (Northern) (cont.)	Llano San Juan MDWCA	84	52	0	5
	Lower Arroyo Hondo MDWCA	250	60	0	17
	Lower Des Montes MDWCA	350	54	0	21
	Ojo Caliente MDWCA	350	55	0	22
	Penasco MDWCA	700	39	0	31
	Plaza De Retiro	80	80	0	7
	Questa Water System	1,820	130	0	265
	Ranchos de Taos MDWCA	900	62	0	62
	Red River Water System (Rio Grande)	500	933	187	335
	Rio Lucio MDWCA	500	36	0	20
	Rodarte MDWCA	75	86	0	7
	San Cristobal MDWCA	139	36	0	6
	Sanchez Mobile Home Park	80	80	0	7
	Talpa MDWCA	1,100	31	0	38
	Taos Municipal Water System	5,301	111	0	657
	Trampas MDWCA	200	24	0	5
	Tres Piedras MDWCA	315	36	0	13
	Twining Water Sys--Taos Ski Valley	500	111	0	62
	Upper Arroyo Hondo MDWCA	198	57	0	13
	Upper Des Montes MDWCA	280	180	0	56
	Upper Ojito MDWCA	45	80	0	4

Source: Longworth et al., 2013, unless otherwise noted.

[a] Determined based on NMED Drinking Water Bureau water supply source locations (NMOSE water use database doesn't distinguish groundwater basin).

[b] For systems supplied by surface water withdrawals, the river basin is provided in parentheses. Rural self-supplied homes are located in the river basin specified in parentheses.

[c] Portion that is in Taos Planning Region

gpcd = Gallons per capita per day

Table 6-4 2010 Water Withdrawals for Drinking Water Supply Systems and Rural Self-Supplied Homes

OSE Declared Groundwater Basin(s) [a]	Water Supplier [b]	Population	Per Capita Use (gpcd)	Withdrawals (acre-feet)	
				Surface Water	Groundwater
Taos County (cont.)					
Rio Grande (Northern) (cont.)	Upper Ranchitos MDWCA	270	87	0	26
	Vadito MDWCA	76	80	0	7
	Valdez MDWCA	100	54	0	6
	Valle Escondido Water System	300	53	0	18
	Vigils Trailer Park	150	89	0	15
	West Rim MDWUA	113	80	0	10
	Taos County public water supply totals	20,178		187	2,097
	County-wide public water supply per capita use [d]		101		
Rio Grande(Northern)	Rural self-supplied homes (Rio Grande)	12,759	80	0	1,143
	Taos County domestic self-supplied totals	*12,759*		*0*	*1,143*
	County-wide domestic self-supplied per capita use [d]		80		

Source: Longworth et al., 2013, unless otherwise noted.

[a] Determined based on NMED Drinking Water Bureau water supply source locations (NMOSE water use database doesn't distinguish groundwater basin).

[b] For systems supplied by surface water withdrawals, the river basin is provided in parentheses. Rural self-supplied homes are located in the river basin specified in parentheses.

[d] County-wide per capita use, calculated as the total population divided by total withdrawals.

gpcd = Gallons per capita per day

Withdrawals in both surface and groundwater irrigation systems include both consumptive and non-consumptive uses and incidental losses:

- Consumptive use occurs when water is permanently removed from the system due to crop evapotranspiration (i.e., evaporation and transpiration). Evapotranspiration is determined by factors that include crop and soil type, climate and growing season, on-farm management, and irrigation practices.

- Non-consumptive use occurs when water is temporarily removed from the stream system for conveyance requirements and is returned to the surface or groundwater system from which it was withdrawn.

- Incidental losses from irrigation are irrecoverable losses due to seepage and evapotranspiration during conveyance that are not directly attributable to crop consumptive use.

    - Seepage losses occur when water leaks through the conveyance channel or below the root zone after application to the field and is either lost to the atmosphere or remains bound in the soil column.

    - Evapotranspiration occurs as a result of (1) evaporation during water conveyance in canals or with some irrigation methods (e.g., flood, spray irrigation) and (2) transpiration by ditch-side vegetation.

Some agricultural water use efficiency improvements (commonly referred to as agricultural water conservation) reduce the amount of water diverted, but may not reduce depletions or may even have the effect of increasing consumptive use per acre on farms(Brinegar and Ward, 2009; Ward and Pulido-Velazquez, 2008). These efforts can result in economic benefits, such as increased crop yield, but may have the adverse effect of reducing return flows and therefore downstream water supply. For example, methods such as canal lining or piping may result in reduction of seepage losses associated with conveyance, but that seepage will no longer provide return flow to other users. Other techniques such as drip irrigation and center pivots may reduce the amount of water diverted, but if the water saved from such reductions is applied to on-farm crop demands, water supplies for downstream uses will be reduced.

Due to the complexities in agricultural irrigation efficiency, no quantitative estimates of savings are included in the projections. However, the regions are encouraged to explore strategies for agricultural conservation, especially those that result in consumptive use savings through changes in crop type or fallowing of land while concentrating limited supplies for greater economic value on smaller parcels. Section 8 outlines strategies developed by the Taos Regional Water Planning Steering Committee to achieve savings in agricultural water use within the region.

Self-supplied industrial, livestock, mining, and power. Conservation programs can be applicable to these sectors, but since future uses are very low in these categories within the region, no additional conservation savings are assumed in the water demand projections.

The *self-supplied commercial* use in the region is primarily for the Red River Fish Hatchery; no conservation was assumed in projections for that category.

Reservoir evaporation. In many parts of New Mexico, reservoir evaporation is one of the highest consumptive water uses, but in the Taos region the use in this category is relatively low. To reduce usage in this category, some areas outside of the region have considered aquifer storage and recovery to replace some reservoir storage, and it may also be possible in some circumstances to gain some reduction in evaporation by storing more water at higher elevations or constructing deeper reservoirs with less surface area for evaporation. However, due to the legal, financial, and other complexities of implementing these techniques, no conservation savings are assumed in developing the reservoir evaporation demand projections for this region.

6.5 Projections of Future Water Demand for the Planning Horizon

To develop projections of future water demand, a consistent method was used statewide. Section 6.5.1 provides a comprehensive discussion of a comprehensive one that includes the methods applied consistently throughout the state to project water demand in all the categories reported in the *New Mexico Water Use by Categories* reports, and some of the categories may not be applicable to the Taos region. The projections of future water demand determined using this consistent method, as applicable, for the Taos region are discussed in Section 6.5.2.

6.5.1 Water Demand Projection Methods

The *Handbook* provides the time frame for the projections; that is, they should begin with 2010 data and be developed in 10-year increments (2020, 2030, 2040, 2050, and 2060). Projections will be for withdrawals in each of the nine categories included in the *New Mexico Water Use by Categories 2010* report (Longworth et al., 2013) and listed in Section 6.1.

To assist in bracketing the uncertainty of the projections, low- and high-water demand estimates were developed for each category in which growth is anticipated, based on demographic and economic trends (Section 6.2) and population projections (Section 6.3), unless otherwise noted. The projected growth in population and economic trends will affect water demand in eight of the nine water use categories; the reservoir evaporation water use category is not driven by these factors.

The 2010 administrative water supply (Section 5.5.1) was used as a base supply from which water demand was projected forward. As discussed in Section 5.5, the administrative water supply is based on withdrawals of water as reported in the *New Mexico Water Use by Categories*

2010 report, which provide a measure of supply that considers both physical supply and legal restrictions (i.e., the water is physically available for withdrawal, and its use is in compliance with water rights policies) and thus reflects the amount of water available for by a region.

The assumptions and methods used statewide to develop the demand projections for each water use category follow. Not all of these categories are applicable to every planning region. The specific methods applied in the Taos region are discussed in Section 6.5.2.

Public water supply includes community water systems that rely on surface water and groundwater diversions other than from domestic wells permitted under 72-12-1.1 NMSA 1978 and that consist of common collection, treatment, storage, and distribution facilities operated for the delivery of water to multiple service connections. This definition includes municipalities (which may serve residential, commercial, and industrial water users), mutual domestic water user associations, prisons, residential and mixed-use subdivisions, and mobile home parks.

For regions with anticipated population increases, the increase in projected population (high and low) was multiplied by the per capita use from the *New Mexico Water Use by Categories 2010* report (Longworth et al., 2013) (reduced for conservation as specified above), times the portion of the population that was publicly supplied in 2010 (calculated from Longworth et al., 2013); the resulting value was then added to the 2010 public water supply withdrawal amount. Current surface water withdrawals were not allowed to increase above the 2010 withdrawal amount unless there is a new source of available supply (i.e., water project or settlement). Both the high and low projections incorporated conservation for counties with per capita use above 130 gpcd, as discussed in Section 6.4, on the assumption that some of the new demand would be met through reduction of per capita use.

For planning purposes, in counties where a decline in population is anticipated (in either the high or low scenario or both), as a conservative approach it was assumed that public water supply would remain constant at 2010 withdrawal levels based on the 2010 administrative water supply (the water is physically available for withdrawal, and its use is in compliance with water rights policies). Likewise, in regions where the population growth is initially positive but later shows a decline, the water demand projection was kept at the higher rate for the remainder of the planning period.

The *domestic (self-supplied)* category includes self-supplied residences with well permits issued by the NMOSE under 72-12-1.1 NMSA 1978 (Longworth et al., 2013). Such residences may be single-family or multi-family dwellings. High and low projections were calculated as the 2010 domestic withdrawal amount plus a value determined by multiplying the projected change in population (high and low) times the domestic self-supplied per capita use from the *New Mexico Water Use by Categories 2010* report (Longworth et al., 2013) times the calculated proportion of the population that was self-supplied in 2010 (calculated from Longworth et al., 2013). In counties where the high and/or low projected growth rate is negative, the projection was set

equal to the 2010 domestic withdrawal amount. This allows for continuing use of existing domestic wells, which is anticipated, even when there are population declines in a county. In regions where the population growth is initially positive but later shows a decline, the water demand projection was kept at the higher level for the remainder of the planning period, based on the assumption that domestic wells will continue to be used even if there are later population declines.

The *irrigated agriculture* category includes all withdrawals of water for the irrigation of crops grown on farms, ranches, and wildlife refuges (Longworth et al., 2013). To understand trends in the agricultural sector, interviews were held with farmers, farm agency employees, and others with extensive knowledge of agriculture practices and trends in each county. Additionally, the New Mexico agriculture census data for 2007 and 2012 were reviewed and provided helpful agricultural data such as principal crops, irrigated acreage, farm size, farm subsidies, and age of farmers (USDA NASS, 2014). Comparison of the two data sets shows a downward trend in the agricultural sector across New Mexico. This decline was in all likelihood related at least in part to the lack of precipitation in 2012: in most of New Mexico 2007 was a near normal precipitation year (ranging from mild drought to incipient wet spell across the state), while in 2012 the PDSI for all New Mexico climate divisions indicated extreme to severe drought conditions. Based on the interviews, economic factors are also thought to be a cause of the decline.

In much of the state, recent drought and recession are thought to be driving a decline in agricultural production. However, that does not necessarily indicate that there is less demand for water. In areas where irrigation is supplied by surface water, there are frequent supply limitations, with many ditches having no or limited supply later in the season. This results in large fluctuations in agricultural water use and productivity from year to year. While it is possible that drought will continue over a longer term, it is also likely that drought years will be interspersed with wetter years, and there is some potential for renewed agricultural activity as a result. With infrastructure and water rights in place, there is a demand for water if it becomes available.

In regions that use surface water for agriculture withdrawals, the 2010 administrative water supply used as the starting point for the projections reflects a near normal water year for the region. For the 2020 through 2060 projections, therefore, it was generally assumed that the surface water demand is equal to the 2010 administrative water supply for both the high and low scenarios. Even if some farmers cease operations or plant less acreage, the water is expected to be used elsewhere due to surface water shortages. Conversely, if increased agricultural activity is anticipated, water demand in this sector was still projected to stay at 2010 administrative water supply levels unless there is a new source of available supply (i.e., water project or settlement).

In areas where 10 percent or more of groundwater withdrawals are for agriculture and there are projected declines in agricultural acreage, the low projection assumes that there will be a reduced demand in this sector. The amount of decline projected is based on interviews with individuals knowledgeable about the agricultural economy in each county (Section 6.2). Even in areas where the data indicate a decline in the agricultural economy, the high projection assumes that overall water demand will remain at the 2010 administrative water supply levels since water rights have economic value and will continue to be used.

The *livestock* category includes water used to raise livestock, maintain self-supplied livestock facilities, and support on-farm processing of poultry and dairy products (Longworth et al., 2013). High and low projections for percentage growth or declines in the livestock sector were developed based on interviews with ranchers, farm agency employees, and others with extensive knowledge of livestock trends in each county (Section 6.2). The growth or decline rates were then multiplied by the 2010 water use to calculate future water demand.

The *commercial (self-supplied)* category includes self-supplied businesses (e.g., motels, restaurants, recreational resorts, and campgrounds) and public and private institutions (e.g., public and private schools and hospitals) involved in the trade of goods or provision of services (Longworth et al., 2013). This category pertains only to commercial enterprises that supply their own water; commercial businesses that receive water through a public water system are not included. To develop the commercial self-supplied projections, it was assumed that commercial development is proportional to other growth, and the high and low projections were calculated as the 2010 commercial water use multiplied by the projected high and low population growth rates. In regions where the growth rate is negative, both the high and low projections were assumed to stay at the 2010 administrative supply water level , based on water rights having economic value. In regions where the population growth is initially positive but later shows a decline, the water demand projection will remain at the higher level for the remainder of the planning period, again based on the administrative water supply and the value of water rights. This method may be modified in some regions to consider specific information regarding plans for large commercial development or increased use by existing commercial water users.

The *industrial (self-supplied)* category includes self-supplied water used by enterprises that process raw materials or manufacture durable or nondurable goods and water used for the construction of highways, subdivisions, and other construction projects (Longworth et al., 2013). To collect information on factors affecting potential future water demand, economists conducted interviews with industrial users and used information from the New Mexico Department of Workforce Solutions (2014) to determine if growth is expected in this sector. Based on these interviews and information, high and low scenarios were developed to reflect ranges of possible growth. If water use in this category is low and limited additional use is expected, both the high and low projections are the same.

The *mining* category includes self-supplied enterprises that extract minerals occurring naturally in the earth's crust, including solids (e.g., potash, coal, and smelting ores), liquids (e.g., crude petroleum), and gases (e.g., natural gas). Anticipated changes in water use in this category were based on information gathered during interviews with individuals involved in or knowledgeable about the mining sector. If water use in this category is low and limited additional use is expected, both the high and low projections are the same.

The *power* category includes all self-supplied power generating facilities and water used in conjunction with coal-mining operations that are directly associated with a power generating facility that owns and/or operates the coal mines. Anticipated changes in water use in this category were based on interviews with individuals involved in or knowledgeable about the power sector. If water use in this category is low and limited additional use is expected, both the high and low projections are the same.

Reservoir evaporation includes estimates of open water evaporation from man-made reservoirs with a storage capacity of approximately 5,000 acre-feet or more. The amount of reservoir evaporation is dependent on the surface area of the reservoir as well as the rate of evaporation. Evaporation rates are partially dependent on temperature and humidity; that is, when it is hotter and drier, evaporation rates increase. Surface areas of reservoirs are variable, and during extreme drought years, the low surface areas contribute to lower total evaporation, even though the rate of evaporation may be high.

The projections of reservoir evaporation for each region were based on evaporation rates reported in the *Upper Rio Grande Impact Assessment* (USBR, 2013), which evaluated potential climate change impacts in New Mexico. This report predicted considerable uncertainty, but some increase in evaporation rates and lower evaporation totals overall due to predicted greater drought frequency and resultant lower reservoir surface areas. Although it is possible that total evaporation will be lower in drought years, since the projections are to be compared to 2010 use, assuming lower reservoir evaporation would give a false impression of excess water. Thus, the low projection assumes 2010 evaporation amounts. For the high projection, the same surface areas as 2010 were assumed, but higher evaporation rates, derived from the *Upper Rio Grande Impact Assessment* (USBR, 2013), were used to reflect potentially warmer temperatures. The high scenario projected using this approach represents a year in which there is a normal amount of water in storage but the evaporation rates have increased due to increasing temperatures.

In reality the fluctuations in reservoir evaporation are expected to be much greater than the high/low range projected using this method. To evaluate the balance between supply and demand, the projections are being compared to the administrative water supply, including reservoir evaporation. It is important to not show an unrealistic scenario of excess available water. Therefore the full range starting with potentially very low reservoir surface areas was not included in the projections.

6.5.2 Taos Projected Water Demand

Table 6-5 summarizes the projected water demands for each water use category for the Taos region, which were developed by applying the methods discussed in Section 6.5.1. As discussed in Section 6.3, population is projected to increase slightly under the low projection and increase at a greater rate for the high growth scenario. The total projected water demand in the county in 2060 ranges slightly, from 123,144 to 127,691 acre-feet per year. Surface water supplies may be considerably lower in drought years, as discussed in Section 5.5.2, but the demand for water does not necessarily decrease when the supply is diminished.

Demand in the *public water supply* category is projected to increase very slightly under the low projection and to increase slightly more under the high projection, in proportion to the projected population growth rates.

Projected water demand in the *commercial* and *domestic* categories is also assumed to be proportional to the population growth rates. Much of the commercial self-supplied use is for the Red River Fish Hatchery, and though that use does not correlate with population growth directly, slightly to moderately increased growth is assumed for the commercial category.

The *agricultural* projections are based on the assumption that the current observed declining trend for agriculture will continue for the short trend, through 2020. However, irrigated agriculture in the region is heavily dependent on surface water, which is highly susceptible to drought; therefore, the recent drought, along with the recession, is thought to be driving the decline, rather than a decrease in desire on the part of agricultural water rights holders to put those rights to beneficial use. Thus it would not be prudent to assume declining demand for agricultural water in the long-term future. While it is possible that drought will continue over a longer term, it is also likely that drought years will be interspersed with wetter years, and there is some potential for renewed agricultural activity as a result. With the many adjudicated water rights in the region (Section 4), there is clearly a demand for agricultural water if it is available. Hence the amount of water devoted to irrigated agriculture is expected remain at 2010 levels over the entire planning horizon, under the assumption that available surface water will always be put to some use. The agricultural sector in Taos County is heavily reliant on federal government payments. If these were to be reduced or eliminated, it could have a detrimental effect on the agricultural sector and decrease water usage.

The *livestock* segment in Taos County is expected see a steep decline by 2020, but to recover to 85 percent and 95 percent of 2010 water usage, respectively, in the low and high projections. In the low scenario, it is expected that some ranches will go out of business because younger people, who do not view ranching as a desirable or economically viable career choice, will not replace the older generation of ranchers.

Table 6-5. Projected Water Demand, 2020 through 2060
Taos Water Planning Region

Use Sector	Projection	Water Demand (acre-feet) [a]					
		2010 [b]	2020	2030	2040	2050	2060
Taos County							
Public water supply	High	2,284	2,551	2,740	2,893	3,056	3,228
	Low	2,284	2,433	2,583	2,634	2,634	2,634
Domestic (self-supplied)	High	1,143	1,289	1,392	1,476	1,564	1,658
	Low	1,143	1,225	1,306	1,334	1,334	1,334
Irrigated agriculture	Low/High	92,283	92,283	92,283	92,283	92,283	92,283
Livestock	High	112	73	84	95	101	106
	Low	112	56	67	78	90	95
Commercial (self-supplied)	High	12,614	14,222	15,360	16,282	17,259	18,295
	Low	12,614	13,512	14,414	14,722	14,722	14,722
Industrial (self-supplied)	Low/High	0	0	0	0	0	0
Mining (self-supplied)	High	11,262	315	11,262	11,262	11,262	11,262
	Low	11,262	315	315	315	315	315
Power (self-supplied)	Low/High	0	0	0	0	0	0
Reservoir evaporation	High	686	698	706	715	719	733
	Low	686	686	686	686	686	686
Rio Arriba County (portion in Taos regional water planning area)							
Public water supply	Low/High	0	0	0	0	0	0
Domestic (self-supplied)	Low/High [c]	1	1	1	1	1	1
Irrigated agriculture	Low/High	123	123	123	123	123	123
Livestock	Low/High	3	3	3	3	3	3
Commercial (self-supplied)	Low/High	0	0	0	0	0	0
Industrial (self-supplied)	Low/High	0	0	0	0	0	0
Mining (self-supplied)	Low/High	0	0	0	0	0	0
Power (self-supplied)	Low/High	0	0	0	0	0	0
Reservoir evaporation	Low/High	0	0	0	0	0	0

[a] Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this table.

[b] Actual withdrawals (Longworth et al., 2013)

[c] Projected future water demand in this sector is based on projected population. Where projected population is lower than the 2010 level, projected demand is set at 2010 withdrawals. The withdrawals in 2010 represent water that has been put to beneficial use and thus represent a valid water right. For planning purposes it is assumed that valid water rights are maintained and will be used in the future.

Table 6-5. Projected Water Demand, 2020 through 2060
Taos Water Planning Region
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Use Sector	Projection	Water Demand (acre-feet) [a]					
		2010 [b]	2020	2030	2040	2050	2060
Total region							
Public water supply	High	2,284	2,551	2,740	2,893	3,056	3,228
	Low	2,284	2,433	2,583	2,634	2,634	2,634
Domestic (self-supplied)	High	1,144	1,290	1,393	1,476	1,565	1,659
	Low	1,144	1,225	1,307	1,335	1,335	1,335
Irrigated agriculture	Low/High	92,406	92,406	92,406	92,406	92,406	92,406
Livestock	High	115	76	87	98	104	109
	Low	115	59	70	81	93	98
Commercial (self-supplied)	High	12,614	14,222	15,360	16,282	17,259	18,295
	Low	12,614	13,512	14,414	14,722	14,722	14,722
Industrial (self-supplied)	Low/High	0	0	0	0	0	0
Mining (self-supplied)	High	11,262	315	11,262	11,262	11,262	11,262
	Low	11,262	315	315	315	315	315
Power (self-supplied)	Low/High	0	0	0	0	0	0
Reservoir evaporation	High	686	698	706	715	719	733
	Low	686	686	686	686	686	686
Total regional demand	High	120,511	111,559	123,955	125,133	126,370	127,691
	Low	120,511	110,637	122,728	123,127	123,139	123,144

[a] Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this table.

[b] Actual withdrawals (Longworth et al., 2013)

[c] Projected future water demand in this sector is based on projected population. Where projected population is lower than the 2010 level, projected demand is set at 2010 withdrawals. The withdrawals in 2010 represent water that has been put to beneficial use and thus represent a valid water right. For planning purposes it is assumed that valid water rights are maintained and will be used in the future.

Both projections in the *mining* category reflect the closure of the Chevron mine in the summer of 2014, resulting in a 97 percent reduction in projected water use from 2010 to 2020. Under the low projection, no recovery from that reduced level is anticipated. Under the high projection, it is assumed that the mine reopens (as it has several times in the past) at historical production levels prior to 2030.

Taos County does not have any significant *industrial* or *power generation* activity. Also, no water use for oil and gas extraction using hydraulic fracturing is occurring or projected.

The Taos region projections include a small water demand in the *reservoir evaporation* category due to the Costilla Reservoir. As discussed in Section 6.5.1, the projected demand is based on 2010 reservoir surface areas so that it can accurately be compared to the 2010 administrative water supply.

7. Identified Gaps between Supply and Demand

Estimating the balance between supply and demand requires consideration of several complex issues, including:

- Both supplies and demands vary considerably over time, and although long-term balanced supplies may be in place, the potential for drought or, conversely, high flows and flooding must be considered. In general, storage, including the capture of extreme flows for future use, is an important aspect of allowing surface water supplies to be used when needed to meet demand during drought periods (i.e., reservoir releases may sustain supplies during times when surface water supplies are inadequate). However, there is little reservoir storage available in the region.

- In wet years where more water is available than in 2010, irrigators can increase surface water diversions up to their water right and reservoirs will fill when inflow exceeds downstream demand, provided that compact requirements are satisfied, to increase storage for subsequent years. Thus, though not quantified, the withdrawals in wet years may be greater than the high projection.

- Supplies in one part of the region may not necessarily be available to meet demands in other areas, particularly in the absence of expensive infrastructure projects. Therefore comparing the supplies to the demands for the entire region without considering local issues provides only a general picture of the balance.

- In the Taos Region reservoir evaporation is relatively low, with only 686 acre feet per year use from Costilla Reservoir. As discussed in Section 6.5.1, the fluctuations in reservoir evaporation are expected to be much greater than the high/low projected range developed for this balance. When comparing the projected demands to the administrative

water supply, which is based on 2010 water withdrawals, 2010 surface areas of reservoirs were used to avoid an unrealistic scenario of excess available water. The actual amount of water that will be used for reservoir evaporation is dependent on the surface area of the reservoir and temperatures. During the first year of a drought when there is surface water in storage, the reservoir evaporation could be similar to 2010 use, but after subsequent years of drought, when storage and surface areas are lower, reservoir evaporation would be lower. As noted in Section 6.5.2, however, the reservoir evaporation category, while included for statewide accounting, is small in the Taos region.

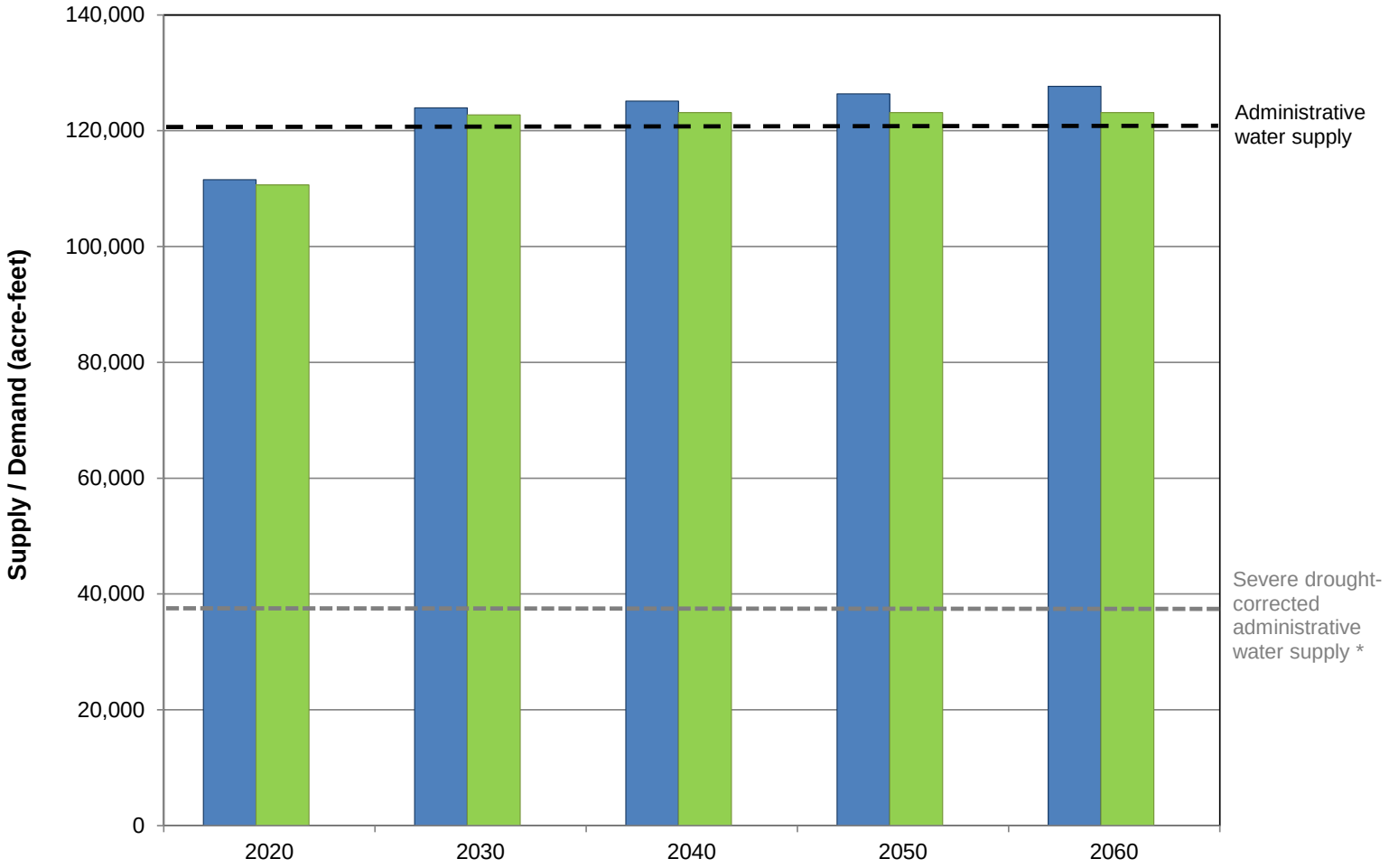
- As discussed in Section 4, there are considerable legal limitations on the development of new surface and groundwater resources, given that surface and surface-connected groundwater supplies are fully appropriated, which affects the ability of the region to prepare for shortages by developing new supplies. The Taos Pueblo Indian Water Rights Settlement (USA et al., 2012) provides guidance and limits on water rights in the central part of the Taos region.

- Besides quantitative estimates of supply and demand, numerous other challenges affect the ability of a region to have adequate water supplies in place. Water supply challenges include the need for adequate funding and resources for infrastructure projects, water quality issues, location and access to water resources, acquisition of water rights to offset stream impacts, limited productivity of certain aquifers, and protection of source water.

Despite these limitations, it is useful to have a general understanding of the overall balance of the supply and demand. Figure 7-1 illustrates the total projected regional water demand in the Taos region under the high and low demand scenarios, and also shows the administrative water supply and the drought -adjusted water supply. As presented in Section 5.5, the region's administrative water supply is 120,511 acre-feet and the drought supply is 37,341 acre-feet, or about 31 percent of a normal year administrative water supply. Under normal conditions there is some moderate growth in water demand anticipated. However, under drought conditions the region shows large shortages between supplies and demands ranging from 86,000 to 90,000 acre-feet, indicating the importance of drought contingency planning.

8. Implementation of Strategies to Meet Future Water Demand

An objective of the regional water planning update process is to identify strategies that will help the region prepare to balance the gap between supply and demand and to address other future water management challenges, including infrastructure needs, protection of existing resources and water quality, and the need to maximize limited resources through water conservation and reuse. The Taos region considered a variety of strategies for addressing these water management challenges. As discussed in Sections 5 and 7, about 80 percent of the water used in 2010 was supplied by surface water; hence, the region is vulnerable to drought, and there is a large gap



* Based on the ratio of the minimum drought of record to the 2010 administrative water supply.

Note: Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

Figure 7-1

TAOS
REGIONAL WATER PLAN 2016
Available Supply and Projected Demand

between projected demands and drought supplies. In addition to the quantitative gap between supply and demand, the region identified concerns with water quality, protecting water rights for use within the region, and acequia and drinking water system infrastructure. The region also considered strategies to address the comprehensive water management issues.

This RWP builds on the 2008 water plan, and considers strategies that will enhance and update, rather than replace, the strategies identified in the accepted water plan. Section 8.1 assesses the status of strategies from the previous regional water plan. Additional strategies recommended in this RWP update—including a comprehensive list of projects, programs, and policies, key collaborative projects, and recommendations for the state water plan—are discussed in Section 8.3

8.1 Implementation of Strategies Identified in Previously Accepted Regional Water Plan

An important focus of the RWP update process is to both identify strategies and processes and consider their implementation. To help address the implementation of new strategies, a review of the implementation of previous strategies was first completed.

The 2008 *Taos Regional Water Plan* recommended the following strategies for meeting future water demand:

- Infrastructure Development
- Water Quality Protection
- Public Education
- Agriculture/Water Rights Protection
- Planning for Growth
- Watershed Restoration
- Data Collection

The steering committee reviewed each of the strategies and indicated that they are all still relevant, though some are being refocused as new recommended strategies (Appendix 8-A). Actions that have been completed to implement the strategies are summarized in Table 8-1.

Table 8-1. Implementation Status of Strategies Identified in Accepted Plan

Strategy	Status
Infrastructure Development	A 2008 Acequia Headgate Improvement Plan was completed– needs a long-term plan to prioritize the needed work.
	Questa received Community Development Block Grant (CDBG) for improvements to their water system.
	El Salto receive Water Trust Board funding for line improvement.
	Hondo received Water Trust Board funding for acequia improvement.
	El Valle de los Ranchos collaborated with others to extend sewer lines.
	Taos Pueblo Indian Water RightsSettlement –$12.7 million was allocated from the State for non-Indian projects.
	El Prado is moving ahead with initial infrastructure projects.
	Red River replaced two wells.
	Cabresto Lake repair was funded by the State.
	El Cerrito ditch replaced pipe.
Water Quality Protection	Taos Soil and Water Conservation District (SWCD) completed investigations of uranium in soil and water.
	Superfund funding was received for Eagle Rock Lake.
	Water quality projects have been initiated at Eagle Rock Lake in Questa.
	Red River applied for New Mexico Environment Department (NMED) Stream Restoration funding.
	Town of Taos passed a stormwater ordinance.
Public Education	Firewise meetings were held to educate/mitigate fire danger.
	Community forums on illegal trash dumping were held.
	Watershed meetings were held in Bitter Creek and the Upper Red River.
	Rocky Mountain Youth Corp distributed low-flow toilets.
Protect Agriculture/Water Rights Protection	Taos County developed a water advisory committee that evaluates water rights transfers, threats, and usage.
	Water rights are being protected by helping the acequias change bylaws.
	San Cristobol and Questa are doing water banking.
	New Mexico Acequia Association is continuing to do workshops and training for acequias in the region.
	New Mexico State University (NMSU) conducted a study in the Valdez area.
	Taos County protested the water right transfer for Top of the World water rights.

Table 8-1. Implementation Status of Strategies Identified in Accepted Plan

Strategy	Status
Planning for Growth	Taos County adopted land use regulations in 2014; A Subdivision Plan and Comprehensive Plan were also developed.
Watershed Restoration	Amigos Bravos developed a watershed plan for the Rio Pueblo watershed and is conducting Rio Fernando water quality sampling every year.
	Stream and watershed restoration has been completed by the Quivira Coalition and partners in the Comanche Creek watershed.
	Village of Questa submitted a 319 grant; did not get funded, but will continue to try.
	Red River fisheries habitat restoration work has been completed in the Questa area.
	Questa Ranger District worked with New Mexico Game & Fish Hatchery.
	Three watershed protection/thinning projects were completed, including fuel breaks with Taos Pueblo.
	Peñasco completed a Community Wildfire Protection Plan.
	Ten Firewise communities were established.
	Taos County is updating its Wildfire Protection Plan (led by Ron Gardiner).
	U.S. Forest Service/Carson National Forest started their Forest Plan revision.
	La Lama receive Collaborative Forest Restoration Program (CFRP) funding for restoration and thinning.
	A County Wildfire Protection Plan (CWPP) was completed for Questa, Red River, Enchanted Circle.
	Rocky Mountain Youth Corp worked with the Town of Taos on a restoration project in Kit Carson Park.
	Red River requested CFRP funding for restoration.
Data Collection	An aquifer mapping study for springs was completed (in coordination with the SWCD and New Mexico Bureau of Geology).
	Amigos Bravos continues to collect water quality data.
	Comanche Creek restoration projects involving data collection were completed and additional projects are planned.

8.2 Water Conservation

Municipal and small water system average per capita use in the Taos Water Planning Region is relatively low (Section 6, Table 6-4); many systems have very low per capita use. Where per capita use is higher, as for the Red River water system, it is reflective of a large amount of water use for tourism and a relatively small number of permanent residents. Red River is pursuing several projects that will help to reduce unaccounted for water and town per capita use (Appendix 8-A). Water conservation programs are already in place in many communities; therefore, few new water conservation projects are included in this RWP update. However, water providers in the region will continue to implement their existing water conservation programs and drought contingency ordinances. Additionally, some smaller systems could benefit from the County or agencies (such as the New Mexico Rural Water Association) developing, updating, and implementing water conservation and drought contingency programs.

8.3 Proposed Strategies (Water Programs, Projects, or Policies)

In addition to continuing with strategies from the previous plan, the Taos region discussed and compiled new project, program, and policy (PPP) information, identified key collaborative strategies, and provided recommendations for the State Water Plan. The recommendations included in this section were prepared by the Taos Regional Water Planning Steering Committee and other stakeholders, and reflect their interest and intent. They have not been evaluated and approved by NMISC.

8.3.1 Comprehensive List of Projects, Programs and Policies

Over the two-year update process, eight meetings were held with stakeholders in the Taos region. These meetings identified the program objectives, presented draft supply and demand calculations for discussion and to guide strategy development, and provided an opportunity for stakeholders to provide input on the PPPs that they would like to see implemented (Section 2). A summary of the PPP information, obtained primarily from input supplied directly by stakeholders, is provided in Appendix 8-A. Information was requested during several open meetings. Requests for input were also e-mailed to all stakeholders who had expressed interest in the regional water planning process.

Some water projects were already identified through the State of New Mexico Infrastructure Capital Improvement Plan (ICIP) process; these projects are also included in the Taos PPP table. The projects included are from the 2017-2021 ICIP list (http://nmdfa.state.nm.us/ICIP.aspx, accessed March 2016), which is updated on an annual basis. Other infrastructure projects that are important to the region may therefore be identified before this RWP is updated again. In general, the region is supportive of water and wastewater, dam safety, and other water-related infrastructure projects.

The PPP list also contains several watershed restoration projects, including some identified in the New Mexico Forest Action Plan. New Mexico State Forestry Division provides annual updates to the recommended watershed restoration projects in the New Mexico Forest Action Plan, and the region is supportive of those ongoing watershed restoration projects, even those that are not specifically identified in the PPP list.

The information in Appendix 8-A has not been ranked or prioritized; it is an inclusive table of all of the PPPs that regional stakeholders are interested in pursuing. It includes both projects that are regional in nature (designated R in Appendix 8-A) and those that are specific to one system (designated SS in Appendix 8-A). The table identifies each PPP by category, including water and wastewater system infrastructure, water conservation, watershed restoration, flood prevention, water reuse, water rights, water quality, and data collection.

In the Taos Region, projects identified in the PPP table are primarily water system infrastructure, irrigation system upgrades, and watershed restoration projects.

8.3.2 Key Strategies for Regional Collaboration

Prioritizing projects for funding is done by each funding agency/program based on their current criteria, and projects are reviewed in comparison to projects from other parts of the state. Consequently, the regional water planning update program did not attempt to rank or prioritize the PPPs identified in Appendix 8-A. However, identifying larger regional collaborative strategies is helpful to successful implementation of the regional plan. At steering committee meetings held in 2015 and 2016, the group discussed PPPs that would have a larger regional or sub-regional impact and for which there is interest in collaboration with entities in other water planning regions to seek funding and for implementation.

The group used an informal process of discussing and refining the definition of potential collaborative strategies and voting to determine the projects of greatest interest and to identify opposition to proposed projects. Key collaborative strategies identified by the steering committee and Taos region stakeholders are shown on Table 8-2.

In order to move forward with implementing the key collaborative projects, additional technical, legal, financial, and political feasibility assessment may be required. A detailed feasibility assessment was beyond the scope and resources of this RWP update.

The Taos Steering Committee decided to form four subcommittees to provide input on specific water management issues and strategies in the Taos Region, as discussed in Section 2. Strategy recommendations for these subcommittees include:

- The acequia subcommittee developed a policy statement regarding the preservation of acequias in the Taos Region (Section 8.3.2.1).

Table 8-2. Key Collaborative Strategies
2016 Taos Regional Water Plan
Page 1 of 7

Project Description	Project Lead	Project Partners	Probable Funding Source(s)	Cost Range	Major Implementation Issues
Enhanced Recharge Investigations					
The projects would involve hydrologic studies to characterize the aquifer and to quantify the water balance for the purpose of enhancing recharge through infiltration galleries, rainwater collection, stormwater management, acequia recharge, small ponds, or other means. The studies would also consider land regulations needed for this effort. The studies would be completed by a hydrologist at the Palemon Martinez Ranch.	• New Mexico Environment Department (NMED) • Taos Soil and Water Conservation District (SWCD)	• County (for regulations) • Town • New Mexico State University (NMSU) • Water Resources Research Institute (WRRI) • Taos SWCD • NMED • Taos Valley Acequia Association/acequias • Bureau of Land Management (BLM)	• Taos SWCD	$30,000	• How to get into County regulations • Effect on streamflow • Access to data

Table 8-2. Key Collaborative Strategies
2016 Taos Regional Water Plan
Page 2 of 7

Project Description	Project Lead	Project Partners	Probable Funding Source(s)	Cost Range	Major Implementation Issues
Data Collection/Repository/Monitoring					
This project involves developing a repository of digital (PDF) format data and information as a resource and educational resource for Taos County. Additional monitoring data will be collected and added to the repository over time. Repository data will include: • Deep wells for the Taos Pueblo Indian Water Rights Settlement • Water quality data, including spring sampling, groundwater age data, and geochemistry • Groundwater level data • NMOSE/NMISC well data • New Mexico Bureau of Geology reports The project will also include mentoring with Taos High School students. The Taos SWCD is preparing to initiate and manage this project, with the repository held in their facilities.	• Taos SWCD (David Jacobs)	• Town of Taos • Taos County • New Mexico Interstate Stream Commission (NMISC)	• Taos SWCD • Town of Taos • Taos County • Taos Pueblo	$100,000	• Cooperation of various entities • Access to data • Keeping updated

Table 8-2. Key Collaborative Strategies
2016 Taos Regional Water Plan
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Project Description	Project Lead	Project Partners	Probable Funding Source(s)	Cost Range	Major Implementation Issues
Implement County Wildfire Protection Plan (CWPP)					
• Implement and continue CWPP based on current county and local CWPPs. • Periodically update county and local plans as needed. • Support local Firewise programs. • Pursue and increase available funding for thinning and maintenance programs.	• Town of Taos (Rick Bellis) • Taos County (Nathan Sanchez) • El Salto CWPP (Martha Brown)	• Firewise communities (8) • Taos County Planning Department • Local fire departments • U.S. Forest Service (USFS) • BLM • Taos SWCD	• LOR Foundation • Rio Grande Water Fund • USFS • Nonfederal land grant (NFL) • Soil and water conservation district • New Mexico State Forestry grants • Association of Counties	$80,000 (small projects) to $500,000 (large NFL projects)	• No major obstacles; only limitations based on availability of funding.

Table 8-2. Key Collaborative Strategies
2016 Taos Regional Water Plan
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Project Description	Project Lead	Project Partners	Probable Funding Source(s)	Cost Range	Major Implementation Issues
Forest Health and Watershed Restoration (e.g., Rio Grande Water Fund[a])					
This project focuses on: • Stewardship thinning for forest and watershed health. • Landscape-scale restoration across jurisdictional boundaries.	• Taos Valley Watershed Coalition (TVWC)	• Local, state, and federal governments • Tribal governments • Non-governmental organizations (NGOs) • Members of TVWC • Carson National Forest • BLM • New Mexico State Forestry • Taos SWCD • Taos County • The Rio Grande Water Fund (which has more than 30 signatory organizations)	• State and federal governments • Private downstream water users	$21 million per year for entire Rio Grande watershed north of Albuquerque (estimated $10 million for Taos County)	• Funding on a reliable recurring basis. • NEPA – needs to be streamlined and applied in common-sense way. • Cross-jurisdictional planning and coordination – need state-level planning and prioritization and incentives. • Public education regarding need for forest health.

Table 8-2. Key Collaborative Strategies
2016 Taos Regional Water Plan
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Project Description	Project Lead	Project Partners	Probable Funding Source(s)	Cost Range	Major Implementation Issues
Capacity Building for Mutual Domestics and Water and Sanitation Districts					
To strengthen the capacity of many small systems, the project includes: • Collaborative regional support for management. • Capacity for metering, maintenance of infrastructure, and extension of lines and tank. • Capacity to acquire water rights	• El Valle de Los Ranchos WSD (Bob Romero)	• Cañon MDWCA (Vicente Fernandez) • Taos County Commission (Tom Blankenhorn) • Andrew Chavez-llano • Arroyo Hondo (Pam and Tom Harris)	• Water Trust Board • Taos Pueblo Indian Water Rights Settlement Fund • State Capital Outlay • U.S. Department of Agriculture (USDA)	Unknown	• Bringing people together to work collaboratively. • Funding.
Climate Change Resilience					
• Projects under the Rio Grande Water Fund support climate resilience by restoring forests to a healthy state and protecting water quality. The Wetland Action Plan also supports this goal by preserving and restoring headwater wetlands, the sponges of our watershed. • Carson National Forest has policies to protect wetlands, and the Natural Resources Conservation Service (NRCS) and the Taos SWCD support projects on private land. Amigos Bravos has a wetlands gem program to support climate resilience.	• TVWC • Amigos Bravos • Taos Land Trust (?)	• NMED • Carson National Forest	• Rio Grande Water Fund • NMED	Unknown	• Community support. • Align this project with the Carson National Forest and vice versa; work will be outside of the Carson National Forest boundary, so important to ensure that we have the same goals so we can collaborate to make climate change resilience happen.

Table 8-2. Key Collaborative Strategies
2016 Taos Regional Water Plan
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Project Description	Project Lead	Project Partners	Probable Funding Source(s)	Cost Range	Major Implementation Issues
Taos County Wetland Action Plan					
Wetlands are the sponges of our watershed. They provide resilience both in times of drought and floods. Wetlands store water and release it slowly over the year instead of all at once during the spring runoff; healthy wetlands are critical for maintaining streamflow. NMED is working with organizations and local governments to develop regional wetland action plans. There is potential federal funding available to draft these plans. Rehabilitation cost share programs are supported by NRCS and Taos SWCD. This project would include: • Develop a Wetland Action Plan to identify wetlands on public and private lands in the planning region, identify priorities for protection and restoration, and establish a robust public outreach, education, and private landowner engagement strategy. • Identify and encourage incentives for private landowners in the planning area to protect and restore wetlands on their property; some specific avenues to consider would be conservation easements, mitigation banking, and a preferential property tax mechanism.	• Amigos Bravos	• Taos SWCD • Taos Land Trust • Carson Forest Service • Town of Taos (Bacapark) • Taos County • NMED	• Town of Taos • Taos County • Federal funds • Rio Grande Water Fund	Unknown	• Community and private landowner support

Table 8-2. Key Collaborative Strategies
2016 Taos Regional Water Plan
Page 7 of 7

Project Description	Project Lead	Project Partners	Probable Funding Source(s)	Cost Range	Major Implementation Issues
Preservation and Capacity Building for Acequias, Including Education and Outreach					
This project intends to protect acequia water rights for use within the region and includes education and outreach on: • Taos Pueblo Indian Water Rights settlement • Impact of adjudication • Updating acequia bylaws to allow for protection from out of region transfers • Addressing abandonment/forfeiture • Water rights protection/transfer notice procedures; elements of water right subfiles for protection of acequias	• Carlos Miera	• New Mexico Acequia Association • Taos Valley Acequia Association • NMOSE/NMISC (for presentation) • Taos Chamber of Commerce • Relators Association • Taos County • Taos SWCD • John Shomaker • Taos Pueblo (Isoazo Nelson) • Municipal government	• NMISC	$150,000	• Funding. • Implementing Taos Pueblo Indian Water Rights Settlement/administration. • Need to educate Board of Realtors, mortgage companies, new landowners, policy makers. • Maintaining native parciante rights. • Developing concise information. • Purpose of mitigation wells. • "The year of the Acequia" proclamative memorials for the month. • Need to document projected needs and water right ownership. • Stock water use.

[a] The Rio Grande Water Fund is an innovative program that will invest in wildfire mitigation treatments and stream restoration in forested headwaters of the Rio Grande, including the Sangre de Cristo Mountains along the western slope in Taos County, in order to protect critical water supplies for communities and downstream water users, and to improve watershed resilience given increasing intensity and severity of wildfires and climate change. The program goals are to generate sustainable funding over the next 20 years to proactively increase the pace and scale of forest restoration, prioritizing the most high-risk areas in the Rio Grande watershed. Leveraging current state and federal Hazardous Fuels Reduction expenditures, the program goal is to generate approximately $15 million to treat up to 30,000 acres per year - a tenfold increase over the current pace of forest treatment in the program area. Strategic landscape-scale investments will also spur local economic growth, create jobs, and revitalize New Mexico's forest industry.

- The watershed subcommittee provided vision, goals, and policy recommendations (Section 8.3.2.2 and Appendix 8-B).

- A key issue in the accepted regional plan and for this update is protecting water rights for use within the region (minimizing downstream transfers). One method that the steering committee adopted to work toward this goal is a public welfare statement. Prior to this update process, a public welfare subcommittee revised the statement and circulated it among many stakeholder groups for comment and revisions. The public welfare subcommittee recommended that the final version of the public welfare statement be included in this Regional Water Plan (Appendix 8-C).

- The mutual domestic subcommittee worked with water systems to identify project needs, which are included in the PPP table in Appendix 8-A. The mutual domestic subcommittee did not adopt a formal policy statement but included their recommendations in individual strategies.

8.3.2.1 Acequia Subcommittee Recommendations

The acequia subcommittee developed the following policy recommendations, which may be adopted as a County Ordinance at a later date:

> ***Whereas**, the acequia systems within the Taos County Regional Water Planning Region [TCRWPR], are the blood lines that define the social, economic and cultural identity of the region, and;*
>
> ***Whereas,** the acequia systems are recognized political sub-divisions by the State of New Mexico (Section 73-2-28, N.M.S.A.1978) and*
>
> ***Whereas**, the acequia systems within Taos County convey water rights that are protected by the Treaty of Guadalupe Hidalgo and International Law, and*
>
> ***Whereas**, the acequia systems within Taos County deliver 77% of the Administrative Water Supply available to the TCRWPR,*
>
> ***It is therefore,** imperative that the acequia systems be forever preserved for future generations to come.*
>
> ***Therefore**, it is highly recommended that local governments, state and federal agencies develop and enforce policies that are consistent with this intent. Specifically, the following action steps are encouraged:*
>
> 1. *Applications to transfer water rights out of the Taos County Regional Water Planning Region and/or within the four sub-regions within the TCRWPR must be deemed to be beneficial to the Taos County Water Planning Region as a whole. Therefore policies should/shall include provisions that "acequia" rights in regards to water transfers are protected and that communities impacted by such transfers are fully engaged prior to approval of any transfer of water rights within TCRWPR.*
>
> 2. *Urban/rural reconnaissance: It is recommended that Taos County and all municipalities within the TCRWPR conduct an urban and rural reconnaissance to map out all acequias and their laterals within their jurisdiction in order to ensure that these acequias and laterals are not negatively affected by development. Rules regarding setback requirements should require on site review to mitigate damages.*
>
> 3. *In collaboration with local governmental entities, establish a process to solicit county wide participation of all Acequia Associations located throughout Taos County so that infrastructure needs*

can be inventoried for financial and technical assistance. This includes providing ongoing education and capacity building for operation of said acequias and operational planning to meet future financial supports and assistance in fulfilling statutory obligations.

4. *In collaboration with local governmental entities, develop a strategy to provide public education on water rights as they pertain to acequias to local governments and the general citizenship. This includes such issues as the Abeyta Water Rights Settlement, impacts and details, abandonment and forfeiture laws, capacity building, water banking and transfers of surface water rights subject to forfeiture to mutual domestic water systems of or purposes deemed beneficial to the TCRWPR.*

5. *Provide incentives to encourage farmers and ranchers to initiate water conservation measures: leveling of the fields for better water flow; perforated pipe for even water flow, lining acequias to prevent seepage, improve diversion channels to eliminate seepage and erosion control, develop "small" storage units to store water during early spring, etc.*

6. *The acequia systems within the TCRWPR were developed for the most part, prior to 1848 (date of Treaty of Guadalupe Hidalgo). These acequia systems are interdependent and interrelated and survive by utilizing time honored customs and traditions regarding water sharing during times of shortages so that no party is deprived of said water, this includes the right to use "sobrante waters" delivered to downstream lands and acequias that experience shortages, especially during times of drought. This time honored custom and traditions need to be honored and respected by preserving such practices.*

7. *Local Governments and Federal and State Land Management agencies can assist and encourage the development and preservation of personal use farms, subsistence farming and support agricultural economic development opportunities.*

8. *Federal, State Water Management agencies along with our local governments need to continue to review the application of Interstate compacts and advocate for a fair distribution of waters for New Mexicans.*

9. *Incorporate relevant or updated policy statement for the 2008 Water Plan.*

8.3.2.2 Watershed Subcommittee Recommendations

The Watershed Subcommittee established the following vision, goals, and policy recommendations for the Taos Region, with additional detail on the recommendations included in Appendix 8-B:

Vision: Healthy resilient watersheds that nourish Taos regional ecosystems and communities with a reliable supply of high quality water.

Goals: In order to secure a clean reliable supply of water in the Taos region, projects, programs and policy initiatives that meet the following goals should be encouraged:

- *Implement watershed restoration and management policies that improve and maintain water quality and supply.*
- *Protect and restore wetlands that provide water storage, regulate stream flow and improve drought resiliency.*
- *Improve watershed resiliency to catastrophic fire by restoring fire-adapted forests.*
- *Promote and implement Green Infrastructure projects (projects that mimic natural processes to infiltrate or reuse storm water) to improve the region's ability to respond to extreme events such as drought and flooding.*

- *Promote integrated mapping, planning, and projects that make the connection between watersheds and end users – headwater to crops and cups projects.*
- *Utilize existing policies, adopt new local policies and advocate for state and federal policies to achieve these vision and goals.*

Policy recommendations: The Watershed Subcommittee outlines recommendations regarding State and local policy that meet the Watershed Subcommittee's vision and goals, improves watershed health, and helps secure a clean future water supply for the region. It is the intent of the Watershed Subcommittee that all such recommendations remain consistent with the Public Welfare Statement of the Taos County Regional Water Plan, and preserve the important historic, cultural, and economic traditions of the region.

Recommendations were provided for the following:

- Forest health and source water protection
- Stream buffers
- Increasing permeability and water storage through green infrastructure, low impact development, and improved rangeland management recommendations
- Wetland protection
- Beneficial use of water rights

Details for each of these recommendations are included in Appendix 8-B.

8.3.3 Key Program and Policy Recommendations

The legislation authorizing the state water plan was passed in 2003. This legislation requires that the state plan shall "integrate regional water plans into the state water plan as appropriate and consistent with state water plan policies and strategies" (§ 72-14-3.1(C) (10)). For future updates of the state water plan, NMISC has asked the regions to provide recommendations for larger programs and policies that would be implemented on a state level. These are distinct from the regional collaborative projects listed in Table 8-2 and the PPPs listed in Appendix 8-A, in that they would be implemented on a state level rather than on a regional or system-specific level. The State will consider the recommendations from all of the regions, in conjunction with state-level goals, when updating the state water plan.

After group discussion, the Taos region identified the following recommendations for PPPs to be considered in the state water plan:

- Capacity building for acequias
- Capacity building for small water systems
- Support for landscape scale restoration across multiple watersheds
- Dedicated funding for watershed restoration, leverage, and match

- Support for statewide aquifer mapping
- Support of green infrastructure and low impact development policies
- Encouragement of best management practices for grazing
- Exploration of instream flow opportunities (legal protection for beneficial use and compatibility with acequias)
- Exploration of changing subdivision regulations to support community water supply
- Enforcement and follow-up to ensure that all water providers have a drought contingency plan

During an open stakeholder meeting, participants were given an opportunity to identify any recommendations that they thought would be problematic. There was some concern that the exploration of instream flow recommendation would not be beneficial to acequias. Participants from the watershed subcommittee indicated that the intention is to explore mechanisms that do not conflict with acequia use.

The 2016 Regional Water Plan characterizes supply and demand issues and identifies strategies to meet the projected gaps between water supply and demand. This plan should be added to, updated, and revised to reflect implementation of strategies, address changing conditions, and continue to inform water managers and other stakeholders of important water issues affecting the region.

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Appendix 2-A

Master Stakeholder List

Taos Region 7 RWP Master Stakeholder List

Updated May 23, 2016

Last	First	Affiliation / Category
Abeyta	Alex	Abeyta Engineering Inc
Abrams	Trudy	
Abt	Stephen	El Rito/Latir Neighborhood Assoc.
Allex	A. Hart	
Armijo	Beverly	Treasurer, Acequia Madre del Rio Grande del Rancho
Atencio	Ernie	
Atencio	Glorianna	Atalaya Acequia Association
Baca	Joaquin	US Fish and Wildlife
Bailon	Vilma	President, Cerro Mutual Domestic Water Association
Barela	Delbert	
Barela	Mario	El Valle de los Ranchos W/S District
Barrone	Daniel	Mayor Town of Taos
Bellis	Rick	Town of Taos Manager
Benson	Tony	Taos SWCD, Western District
Besser	Ryan	BLM – TAFO
Blaine	Tom	State Engineer, OSE
Blankenhorn	Tom	Taos County Commission
Bordegaray	Angela	Interstate Stream Commission
Brown	Martha	El Salto Firewise
Caldwell	Jake	LOR Foundation
Calhoun	Linda	Mayor of Red River
Cantu	Judi	Councilor, Town of Taos
Chavez	Andrew	Llano Quemado MDWCA
Chino	Philippe	Executive Director, Questa Economic Development Fund
Church	Russell	Town of Red River
Cisneros	Carlos	NM State Senator
Cisneros	Richard A	
Coggins	Evelyn & Gary	Questa Citizens Ditch Association
Collier	Robin	Cultural Energy
Colonius	Carl	Del Norte Trails Coalition
Conn	Rachel	Amigos Bravos
Cordova	Leandro	Taos County Manager
Cordova	Nelson J.	Water Rights Coordinator, Taos Pueblo
Cote	Chris	Taos County WUI Coordinator
Cortez	David	
Cozart	Duke	Western Region

Note: Those interested in developing collaborative projects or ongoing planning efforts may contact the NMISC Regional Water Planning Manager for further information about the region's stakeholders.

Taos Region 7 RWP Master Stakeholder List

Updated May 23, 2016

Last	First	Affiliation / Category
Cramer	Jennifer	USFS, Carson NF
Deans	Charlie	Community By Design
Dennis	Sylvia Rains	Wildland Dance
Dixon	Deborah	ISC Director
Domenico	Rae	
Dozz, Sr.	Siloc	
Duran	Brian	President, Mutual Domestic Water Assn
Edmister	Consuelo	Hondo Mesa
Fambro	Jim	Taos County Commissioner
Ferguson	Gary	ULCNA
Fernandez	Vicente	Canon MDWCA
Fielding	Martha	Business Owner/Farmer
Flanigan	Kevin	ISC
Foley	Walt	Red River Ski Valley
Foster	Matthew	Taos Ski Valley Planner
Fratrick	Mark	Village Administrator, Village of Taos Ski Valley
Freiboth	Erin	Questa Economic Development Fund
Friedman	Justin	La Lama MDWCA
Gallegos	Mark	Mayor, Village of Questa
Gallegos	Roberto	
Gallegos	Stella	El Salto
Garcia	Danny	
Garcia	Esther	Cabresto Ditch Association
Garcia	Sandra	El Valle de los Ranchos W/S District
Gardiner	Ron	Land and Water Clinic
Geery	Emily	ISC Regional & State Water Planning Manager
Gibson	Bill	
Gilbert	Jim	NMSU Acequia del Llano
Gilroy	Jim	
Gonzales	John	TVAA
Gonzales	Telesfor	Chair, El Prado Water & Sanitation
Gonzales	Thomas	NRCS
Hahn	Fritz	Councilor, Town of Taos
Hall	Dale	US Fish & Wildlife Service
Hannigan	Tyler	El Valle de los Ranchos W&S
Harris	Pam	Mutual Domestic Water Assocation

Note: Those interested in developing collaborative projects or ongoing planning efforts may contact the NMISC Regional Water Planning Manager for further information about the region's stakeholders.

Taos Region 7 RWP Master Stakeholder List

Updated May 23, 2016

Last	First	Affiliation / Category
Harris	Steve	Executive Director, Rio Grande Restoration
Harris	Tom	UAHWUA
Healy	Trudy Valerio	Healy Foundation
Heafey	Derek	Chevron
Herrera	Jean B.	Cabresto Lake Ditch Assoc.
Herskovits	Simeon	Advocates for Community and Environment
Hilton	Joanne	Hydrology Consultant
Humphrey	Mary	
Hunter	Michelle	Bureau Chief, NMED
Jacobs	David	Consulting Geologist
Jaramillo	Brent	Taos County
Jetter	Steve	NMED Superfund Oversight
Johnson	Mark	President, Valle Escondido Home Owners Association
Johnston	Jessica	Aguas Nortenias
King	Linda / Bill	TCAR/UNM Taos
King	Neal	Mayor, Village of Taos Ski Valley
Leherissey	Tanya	La Jicarita Watershed and Wastewater Group
Lementino	Levi	Director, Environment Department
Lithgow	Jason	NM State Land Office
Littlefield	John	Carson NF, USFS
Logan	J.R.	Staff Reporter, The Taos News
Lopez	Arlene	Vadito MDWCA Acequia Community Center
Lopez	Ernie	NM State Forestry
Lopez	Michelle Estrada	Bureau of Reclamation, Pecos Basin Bureau Manager
Lundahl	Anders	NM ISC
Lyles	Tommy	Communications Advisor, CEMC Questa Mine/Chevron
Maloney	Honore / John	Upper Las Colonias Neighborhood Association
Marcoline	Joe	Mine Waste Hydrology, Mining Environmental Compliance Section
Martinez	Albino	Taos County Association of Realtors
Martinez	Gayle	Taos County Chamber of Commerce
Martinez	George	Rio Costilla Cooperative Livestock Assn.
Martinez	Mike	LDMWA Des Montes
Martinez	Renee	Village of Questa
Martinez	Palemon A.	Taos Valley Acequia Association
Mascareñas	Mary T. / Ambrose	Acequia de Llano de San Juan

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Taos Region 7 RWP Master Stakeholder List

Updated May 23, 2016

Last	First	Affiliation / Category
Mascarenas	Ronald	Acequia de Llano de San Juan Nepomuceno
Matthews	Kay	La Jicarita News Rio Pueblo/Rio Embudo Watershed
McCarthy	Laura	Nature Conservancy
McGough	Peter	Upper Colonias Neighborhood Association
Medina	Cipriano	Gravel Mining
Mermejo	Richard	Governor, Pueblo of Picuris
Miera	Carlos D.	Des Montes Ditch Assn.
Miera	John	Carson NF
Miller	Greg	USFS, Carson National Forest
Mitchell	Toner	Trout Unlimited
Mondragon	Bennie	Central Region
Moon	Catherine	RANM Legislative Committee
Naranjo	Kevin	Carson National Forest
Norsworthy	Billie Jo	RCCLA
O'Donnell	Candyce	Taos County Commissioner
O'Neill	Dr. Kate	Executive Director, UNM Taos
Ortez	Kristina	Taos Land Trust
Ortega	John / Anthony	Councilman, Village of Questa
Padilla	George & Louise	
Painter	John	El Prado Water and Sanitation District
Peterson	Meg	
Pieper	Chris	Educator/Business Owner
Pyne	Gary	Lt. Governor, Picuris Pueblo
Quintana	Daniel	Member, Cerro Regional Water Assoc
Rael	Georgiana	Village of Red River Town Administrator/Clerk Alternate
Rael	Marcus	Attorney, Village of Questa
Rael-Vigil	Cynthia	
Reed	Thomas A.	LLano Ditch/Cerro Ditch Assoc.
Rich	Peter	Carson NF
Riseley-White	Hannah	Water Resource Specialist, NM Interstate Stream Commission
Rivera	Jose	UNM Professor
Rodarte	Margaret	Llano Largo Rodarte, NM
Romeling	Shannon	Amigos Bravos
Romero	Alberto	Vadito Water

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Taos Region 7 RWP Master Stakeholder List

Updated May 23, 2016

Last	First	Affiliation / Category
Romero	Bob	Taos County Water Advisory Committee
Romero	Clyde	Governor, Taos Pueblo
Romero	Edward	Mayordomo
Romero	Fabi	Acequias
Romero	Gabriel	
Romero	José D.	VMDWCA Acequia Vadito
Romero	Rosemary	Rosemary Romero Consulting
Rose	Mary	El Rito/Latir Neighborhood Assoc
Roybal	Andrew I.	Peñasco Acequia
Runspot	Yancey	NDCBU
Russell	Gail	Atalaya Acequia Association
Salazar	Roberta	Rivers and Birds
Sanborn	Erin	Taos Green Chamber
Sanchez	Nathan	Taos County
Sanchez	Nick	Taos County Assessor's Office
Santisteven	Miguel	
Schuetz	Mark	Lifestream
Shannon	Karen Quintana	Mutual Domestic Water Assn.
Sill	Duncan	North Central NM Economic Development District
Silva	Carol	El Salto MDWCA
Solomon	Debra	Latir Neighborhood Assoc
Stagg	Chris	Councilor, Village of Taos Ski Valley
Suazo	Gil	Water Resource Specialist, Water Resource Management Program Taos Pueblo
Suazo	Mario	UNM-Taos
Sullivan	Yesca	EHC
Szczech	Larry	El Salto Mutual Water
Terry	Ted	Taos County Ass. Realtors
Teter	Fabiola	Acequias
Thielke	Neal	Acequia de Llano de San Juan
Thomas	Bill	
Thomas	Ben	Rocky Mountain Youth Corps
Thurnton	Iris	Advocates for Community
Toner	Mitchell	Trout Unlimited
Torres	John	El Prado Water District
Trujillo	Antonio	

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Taos Region 7 RWP Master Stakeholder List

Updated May 23, 2016

Last	First	Affiliation / Category
Trujillo	Loretta	Village Administrator, Village of Questa Alternate
Trujillo	Richard	OSE, Acequia Liaison
Trujillo	Susan	
Valdez	Tony	TCCES
Van Buren	Matt	Taos Land Trust
Vasquez	Bonifacio I.	Acequia de Llano San Juan de Nepomuceno
Vidaurre	Lydia	Treasurer, Acequia del Llano
Vigil	Ben	
Vigil	Billy	RCCLA
Vigil	Francisco E.	Northern NM Stockman's Association
Vigil	Medardo	
Vigil	Peter A.	Taos Soil & Water Conservation District
Walker	Liz Beth	NRCS
Waltz	Alicia	
Weber	Patrick / Mukta	
Weber	Renee	Taos County
Wenger	Lynda / Jim	Rio de Don Fernando South Ditch
Wittman	Tom	Councilor, Village of Taos Ski Valley
Wiard	Barb	Councilor, Village of Taos Ski Valley
Wyse	Mary	Tres Piedras MDWCA
Wood	Roman	

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Appendix 2-B

Single Comment Document: Summary of Comments on Technical and Legal Sections

Taos Regional Water Plan Compilation of Comments on Draft Plan

No.	Comment Source	Location (Section/Page/ Paragraph)	Comments
1	Thomas Harris	General	At our last meeting, regional water plan in Taos, i said that i would forward contact information wrt NM State collecting data in some wells wi the Rio Hondo watershed. Dr. Carlos Ochoa initiated the study however he has now gone to Oregon? Dr. Samfernal (sp) 1575 646 4337, is the contact in Las Cruces. The data collection is currently in progress collecting depth and temperature information i believe. The study beginning in ca. February of 2012.
2	Tony Benson - handwritten markups to text	Page 13	"Although there is ~~consensus~~ **no consensus** among climate scientists that global temperatures are warming, there is considerable uncertainty regarding the specific spatial and temporal impacts that can be expected. To assess climate trends in New Mexico, the NMOSE and NMISC (2006) conducted a study of observed climate conditions over the past century and found that observed wintertime average temperatures had increased statewide by about 1.5°F **<corrected for heat island?>** since the 1950s."
3	Tony Benson - handwritten markups to text	Page 13	"Within the most recent 30-year period **<20 year drought ('94-'14)>** the warmer spring and early summer temperature changes account for a larger percentage of the variability in streamflow than does precipitation."
4	Tony Benson - handwritten markups to text	Page 13	"Temperature ~~is expected to continue to~~ **may** rise." **<(on 18 year hold) - even ISC agrees> <some spots expected to cool next decade; see Range mag. Winter 2015/16>**
5	Tony Benson - handwritten markups to text	Page 13	"Reservoir and other open water evaporation ~~are expected to~~ **may** increase."
6	Tony Benson - handwritten markups to text	Page 14	"Its primary use has been for irrigated agriculture with a much smaller **<any now?>** amount used for mining."
7	Tony Benson - handwritten markups to text	Page 14	"Another important source of ~~supply~~ **rights** to the region is water from the San Juan-Chama Project."
8	Tony Benson - handwritten markups to text	Page 14	"In general, this water will be used to offset groundwater pumping depletions **<leave in Rio Grande?>** to the Rio Grande."
9	Tony Benson - handwritten markups to text	Page 18	"Depths to groundwater range from less than 1 foot to 275 feet below ground surface, and wells yield from 8 up to ~~440~~ **2000** gpm."
10	Tony Benson - handwritten markups to text	Page 18	"Conclusions of this study included (Winograd, 1959)**<out of date>**:
11	Tony Benson - handwritten markups to text	Page 18	"Groundwater in the Sunshine area originates primarily from ~~surface water~~ **mtn. front recharge** (Costilla **<NO>** Creek) losses."
12	Tony Benson - handwritten markups to text	Page 18	"**<NO>** Semi-perched conditions exist for groundwater within the alluvial sediments."
13	Tony Benson - handwritten markups to text	Page 18-19	"The basalt and underlying Santa Fe Group sediments are probably recharged from the ~~Tusas and San Juan Mountains~~ **Brazos Range** (Benson, 2004). Wells in the northern third of the Taos Plateau are about 200 to 300 feet deep and produce from the Miocene Los Pinos Formation (~~Benson, 2004~~**Johnson and Bauer 2012 NM Bur. Geology OFR-**)."
14	Tony Benson - handwritten markups to text	Page 19	"In the Sangre de Cristo Mountains groundwater is withdrawn from shallow wells in the alluvium of stream valley deposits. Runoff from precipitation recharges the alluvium. In general, the Precambrian and Tertiary formations do not store or yield much water (Garrabrant, 1993).**<runoff (?) into watershed, winter snowpack recharge if GW, NMGS 2015>**"

Taos Regional Water Plan Compilation of Comments on Draft Plan

No.	Comment Source	Location (Section/Page/ Paragraph)	Comments
15	Tony Benson - handwritten markups to text	Page 19	"Much of the quantitative information regarding aquifer properties in the Taos Valley area was compiled and analyzed as part of the development of a settlement model for the Abeyta Settlement." **<-but most wells in wrong locations, details lacking; heterogeneous aquifer Glorita NMGS 2000>**
16	Tony Benson - handwritten markups to text	Page 20	Top of page - new bullet:**Ojo Caliente - Benson and Gervasa NMGS Guidebook, 2011 p. 139-140**
17	Tony Benson - handwritten markups to text	Page 20	"~~Numerous~~ **Some** wells are present in the Sunshine Valley in the Costilla Plains."
18	Tony Benson - handwritten markups to text	Page 20	"Near Tres Piedras **some** wells average about 780 to 960 feet in depth...."
19	Tony Benson - handwritten markups to text	Page 20	Bottom of list - new bullet: **Bauer et al., 2015 (in press) S. Taos Valley, water level stayed same**
20	Tony Benson - handwritten markups to text	Page 20	"In order to evaluate changes in water levels over time, the USGS monitors groundwater wells throughout New Mexico (Figure 5-11). ~~The periods of record for many of the wells are short (less than 10 years), and the hydrographs often exhibit periodic fluctuations or inconsistent patterns that do not indicate clear trends.~~"**<rising 70-80's slightly lower '93-'14> <Benson and Gervasa 2015 NMGS abstract - 1955-2015 records in Sunshine Valley>**
21	Tony Benson - handwritten markups to text	Section 5.4	Notes in margin: **2008 USGS Prof. Paper 1728, 25 volumes, Geochem base for Red River Groundwater quality - Drakus 2004 NMGS** **Benson & Gervasa 2013? Ojo Cal NMGS Spring Uranium** **Benson & Gervasa 2011 S. Taos Valley NMGS Spring Geochemistry** **Benson, Stone, Gervasa 2014 Hondo-Seco uranium NMGS Spring mtg.**
22	Tony Benson - handwritten markups to text	Section 7, Page 40	"~~Both supplies and demands vary~~ **Supply for irrigation water varies** considerably over time **<-demand is always greater than supply for irrig.>**, and although long-term balanced supplies may be in place, the potential for drought or, conversely, high flows and flooding must be considered. In general, storage, including the capture of extreme flows for future use, is an important aspect of allowing surface water supplies to be used when needed to meet demand during drought periods (i.e., reservoir releases may sustain supplies during times when surface water supplies are inadequate). However, there is little reservoir storage available in the region." **<stormwater runoff infiltration galleries?>**
23	Tony Benson - handwritten markups to text	Section 7, Page 40	"In the Taos Region reservoir evaporation is relatively low, with only 686 **<-1/2 to Colo.>** ac-ft/yr use **<or ET?>** from Costilla Reservoir."
24	Tony Benson - handwritten markups to text	Section 7, Page 40	Note in bottom margin: **NMWR/NMSU studies on irrigation recharge at Alcalde, Valdez in progress (90% recharge, 10% ET)**
25	Tony Benson - handwritten markups to text	Section 8.1	Notes: **water level monitoring ?** **aquifer recharge studies** **infiltration gallery (riparian recharge)** **deep well(s) report** **stormwater runoff** **$250,000/yr. for acequia infrastructure** **stream/acequia geochemistry** **list of major acequia related (diversion dams)**
26	Tony Benson - handwritten markups to text	Figure 5-4	Note next to bottom graph: **2009-15 www.waterunderground daily records from Taos Airport**

Taos Regional Water Plan Compilation of Comments on Draft Plan

No.	Comment Source	Location (Section/Page/ Paragraph)	Comments
27	Joseph Marcoline	Section 3.3, par. 2	Replace "The groundwater is of varying yield and quantity and is found primarily in volcanics and Santa Fe Group sediments on the Taos Plateau, in Santa Fe Group sediments on the Costilla Plains, and along river valleys or in near-surface fractures in the Sangre de Cristo Mountains."with"The primarily aquifers are comprised of late volcanics and Santa Fe Group sediments on the Taos Plateau, in Santa Fe Group sediments on the Costilla Plains, in alluvial sediments along river valleys and in near-surface fractures in the Sangre de Cristo Mountains. The quantity and quality of groundwater and aquifer yields are highly variable."
28	Joseph Marcoline	Section 5, Page 7, 2nd complete bullet	"The Village of Questa does not have adequate water rights to support its current and future needs and is actively seeking additional water rights **<This may have recently changed with Questa acquiring new riights?>** . The Village also has infrastructure maintenance and upgrade needs."
29	Joseph Marcoline	Section 5, Page 9, 1st complete bullet	"Though molybdenum mining activities in the Red River drainage ceased in the summer of 2014, and possibly for the long-term, there is an ongoing cleanup effort being conducted under the Superfund program~~., and~~ **Concentrations of molybdenum, manganese uranium and sulfate are locally approaching and exceeding State water quality standards and federal remediation goals in the alluvial aquifer down gradient of the tailing facility. The quality of these shallow alluvial aquifer systems and of the** Red River ~~water quality is~~ **are** ~~an~~ ongoing challenge**s** for the region.
30	Joseph Marcoline	Section 5, Page 9, 5th complete bullet	"Water quality testing conducted by the Taos SWCD indicated that uranium levels in domestic wells in some locations south of Rio Hondo approach or exceed ~~drinking~~ **state** water **quality** standards."
31	Joseph Marcoline	Section 5.3.1	"Since the original plan was published, additional ~~investigation~~ **work by the New Mexico Bureau of Geology & Mineral Resources include hydrogeologic investigations** of the northern Taos Plateau ~~has been conducted by the New Mexico Bureau of Geology & Mineral Resources~~ (Johnson and Bauer, 2012)**, the South Taos Valley (Johnson and Bauer, 2014) and the Questa area (Johnson and Bauer, 2015)**."
32	Joseph Marcoline	Section 5.3.2, 2nd bullet	"Groundwater elevations in western Taos County indicate southeasterly flow and **have a** gradient toward the Rio Grande,...."
33	Joseph Marcoline	Section 5.4.1, 1st paragraph	"The permitted discharges include three public wastewater treatment plants, one fish hatchery, and the Chevron ~~m~~**M**ine along the Red River."
34	Joseph Marcoline	Section 5.4.1, 2nd paragraph	"These facilities must comply with the New Mexico Water Quality Control Commission (NMWQCC) regulations (NMWQCC, 2002) and obtain approval of ~~a~~ discharge plan**s**, which provide~~s~~ for measures needed to prevent**,** ~~and~~ detect**, and abate** groundwater contamination. A variety of facilities fall under the discharge plan requirements, including mines, sewage dischargers, dairies, food processors, sludge and septage disposal facilities, and other industries. The NMWQCC regulations contain requirements for cleanup of any groundwater contamination detected under discharge plan monitoring ~~requirements~~. Until such cleanup is complete, these facilities may impact the availability of water supplies of sufficient quality for intended uses. Details indicating the status, **volumes,** waste type, and treatment for individual discharge plans can be obtained from the NMED Ground Water Bureau website (http://www.nmenv.state.nm.us/gwb/)."
35	Joseph Marcoline	Section 5.4.1, Page 22, 1st complete paragraph	"The site includes the former mine and milling operations and multiple tailing~~s~~ ponds. The mine was placed on the National Priorities (Superfund) list in 2000. In 2012, the EPA and Chevron Mining Inc. (CMI) signed ~~an~~ **two** administrative order**s** of consent **(AOCs), one for the** cleanup of soil contaminated by polychlorinated biphenyls (PCBs), removal of historical tailing spill deposits along the Red River, and ~~other cleanup activities~~ **the diversion of irrigation return flows around the tailing waste** (U.S. EPA, 2014b). **The second AOC was for procedures and technical analyses to produce a detailed set of plans and specifications for implementation of portions of the Remedial Action selected in EPA's Record of Decision for the Chevron Questa Mine site.** The mine closed in 2014, but cleanup activities will continue."

Taos Regional Water Plan Compilation of Comments on Draft Plan

No.	Comment Source	Location (Section/Page/ Paragraph)	Comments
36	Joseph Marcoline	Section 5.4.2, Page 23, 2nd paragraph	"Elevated uranium **<we have seen high uranium in wells in the canyoncito area along the Rio Embudo>** in wells in the Rio Ojo Caliente area and south of the Rio Hondo emanating from natural sources (Benson and Gervason, 2013; Benson et al., 2014) represents a nonpoint source."
37	Joseph Marcoline	Section 6.4, Page 33, 1st sub-bullet	"Seepage losses occur when water leaks through the conveyance channel or below the root zone after application to the field. The water remains in the soil column **<from a conceptual standpoint this is probably not real. Water below the depth of ET will continue down and ultimately will recharge GW or SW. The overall change in storage is transient and the system in this semi-arid environment tends to equilibrate fairly rapidly - i.e., there are not multi year significant changes in bulk water storage in the unsaturated system - in other words, it either goes out in ET or goes to GW>** or is lost to the atmosphere and **i**t does not return to the shallow groundwater or stream system."
38	Joseph Marcoline	Section 6.5.2, Page 39-40	"Both projections in the mining category reflect the closure of the Chevron mine in the summer of 2014, resulting in a 97 percent reduction in projected water use from 2010 to 2020. Under the low projection, no recovery from that reduced level is anticipated. Under the high projection, it is assumed that the mine reopens (as it has several times in the past) at historical production levels prior to 2030.**<how significant is the addition of 1600 to 3200 gpm of water that will be discharged out a new NPDES outfall directly to the Red River once the water treatment plant opens in 2016?>**"
39	Joseph Marcoline	References	Should add two new Johnson and Bauer Publications to the reference list for the Taos South and the Questa work
40	Acequia Subcommittee, Carlos Miera recorder	General	It appears that the ISC is attempting to complete the update of the RWP with a limited budget, thus putting the burden of obtaining public input on the shoulders of the sub-committees without any financial support, thus limiting public involvement. The process was not funded adequately.
41	Acequia Subcommittee, Carlos Miera recorder	General	Concern that a one size fits all template does not allow for regional differences to be fully explored and described for planning purposes. Each sub-region in Taos County has its own unique challenges. Document appears to have "Boilerplate language" in some sections and specifics to planning region.
42	Acequia Subcommittee, Carlos Miera recorder	General	Use sections from prior 2008 water plan (review and compare). Not clear if update is to be used in conjunction with 2008 water plan or will update replace all or part of 2008 water plan.
43	Acequia Subcommittee, Carlos Miera recorder	General	Ignored, overlooked our original intent to create sub-regions in Taos County for planning purposes.
44	Acequia Subcommittee, Carlos Miera recorder	General	Only 3 meetings in FY15 is of concern
45	Acequia Subcommittee, Carlos Miera recorder	General	Have land management agencies on a separate committee after public involvement process is completed so that their issues and concerns can be addressed.
46	Acequia Subcommittee, Carlos Miera recorder	General	Public welfare statement is omitted from this document. I was felt that Public Welfare statements should be updated and made a part of this document.
47	Acequia Subcommittee, Carlos Miera recorder	Page 21	Rio Hondo start of impaired waters not realistic.

Taos Regional Water Plan Compilation of Comments on Draft Plan

No.	Comment Source	Location (Section/Page/ Paragraph)	Comments
48	Acequia Subcommittee, Carlos Miera recorder	Introduction, Page 1, 3rd bullet	This is key. Needs to be inclusive, thus the need for outreach to outlying communities throughout Taos County. Document focuses on issues facing the Taos Valley region and those issues should not be generalized for the region as a whole.
49	Acequia Subcommittee, Carlos Miera recorder	Section 1, Page 3, last bullet before Section 2	A size fits all approach only works if it is inclusive of sub-regions within Taos County. Examples listed below.
50	Acequia Subcommittee, Carlos Miera recorder	Section 2	Lack of time and resources to fully obtain public involvement.
51	Acequia Subcommittee, Carlos Miera recorder	Section 3.1	include reference to amount of land federally owned and their involvement
52	Acequia Subcommittee, Carlos Miera recorder	Section 3.1	Originality, the Ojo Caliente area within Taos County was to be made part of the Rio Arriba planning region. This area of Taos County is ofter ignored.
53	Acequia Subcommittee, Carlos Miera recorder	Section 3.1, 2nd paragraph	Dividing the County into 4-subregions was demanded by the citizens of these areas to ensure that their needs for water planning and management was not overshadowed by the needs of the Taos Valley.
54	Acequia Subcommittee, Carlos Miera recorder	Section 3.2	"For example, temperatures range from lows that are well below 0 degrees Fahrenheit (°F) in the mountains to highs in excess of 100°F in the valley." **<Use USDA data, use the mean>**
55	Acequia Subcommittee, Carlos Miera recorder	Section 3.3, 2nd sentence	"Important"? perhaps use the term "major" and include Rio Santa Barabara and Rio Pueblo. What about the Rio Pueblo/Santa Barbara? example of not adhering to the 4-subregion policy. Cabresto creek
56	Acequia Subcommittee, Carlos Miera recorder	Section 3.4, 2nd paragraph	"However, irrigated agriculture, with about 300 acequias in the planning region, is still extremely important in the planning region, particularly in terms of water planning." **<300 acequias, is this number accurate?>**
57	Acequia Subcommittee, Carlos Miera recorder	Section 3.4, 3rd paragraph	"Two pueblos are located in the region (Taos and Picuris Pueblos), and the federal enclaves within the region consist of land managed by the Forest Service and the Bureau of Land Management (BLM). Nevertheless, a good portion of the land is privately owned." **<Provide % breakout, between State/Federal land and private land holdings.>**
58	Acequia Subcommittee, Carlos Miera recorder	Section 4	When prepared, will committee have an opportunity to review and discuss? Need to find for review
59	Acequia Subcommittee, Carlos Miera recorder	Section 5, Page 6, 2nd bullet	"More than 300 acequias are present in the region, and the pueblos have practiced agriculture in the region for centuries."**<Is this number accurate? or cut and paste boilerplate language?>**
60	Acequia Subcommittee, Carlos Miera recorder	Page 9, 3rd complete bullet	Health concerns, and mitigation efforts should be noted as part of the Regional Water Plan. Otherwise lost in governmental bureaucracy .

Taos Regional Water Plan Compilation of Comments on Draft Plan

No.	Comment Source	Location (Section/Page/ Paragraph)	Comments
61	Acequia Subcommittee, Carlos Miera recorder	Page 9, 5th complete bullet	"The effects can be mitigated with simple filters for domestic wells or treatment systems for community wells (Benson et al., 2014)." **<Problem more complicated than that. Some water filters will not eliminate uranium. reverse osmosis? Need to provide a true picture and mitigation efforts for mutual MDWA's. and private wells>**
62	Acequia Subcommittee, Carlos Miera recorder	Page 9	Water supply issues west of the Gorge is not addressed. Population increase is projected due to afford-ability of land in the area. Penasco area
63	Acequia Subcommittee, Carlos Miera recorder	Figure 5-1	Does not show data for Rio Pueblo/Santa Barbara drainage. Plans to obtain?
64	Acequia Subcommittee, Carlos Miera recorder	Section 5.1.2, last paragraph (page 14)	Effort needs to be explored and clarified per the Abeyta Settlement. Development of small storage facilities?
65	Acequia Subcommittee, Carlos Miera recorder	Section 5.2, 1st paragraph	Again, this leaves out the southeastern part of the region. Rio Pueblo/Santa Barbara..
66	Acequia Subcommittee, Carlos Miera recorder	Section 5.2, last paragraph on page 14	"The administrative water supply discussed in Section 5.5 represents the available supply considering both physical and legal limitations." **<does not fully show or fully address the question.. How will the region address the difference between the available "administrate water supply and the projected need without impacting "acequias" and parciente water rights?>**
67	Acequia Subcommittee, Carlos Miera recorder	Section 5.2, Page 15, 1st paragraph	limited assessment of the Santa Barbara Watershed, as this watershed covers a lot of ground.
68	Acequia Subcommittee, Carlos Miera recorder	Section 5.2, Page 15, 2nd paragraph	How does this data impact in-stream flow advocacy during the summer months? Access upstream of agricultural lands and downstream of agricultural lands.
69	Acequia Subcommittee, Carlos Miera recorder	Section 5.2	no tables for South Eastern Taos County or Penasco Area. Needed for region wide planning. Gaging stations could be place a point above the first point of diversion and below last point of diversion to measure practicality of in stream flow.
70	Acequia Subcommittee, Carlos Miera recorder	Section 5.2, Page 15, 4th paragraph	"Table 5-6 summarizes the characteristics of the one large reservoir (i.e., storage capacity greater than 5,000 acre-feet, as reported in the NMOSE Water Use by Categories report [Longworth et al., 2013]) in the region." **<Table 5-6 does not show this information. Are we still in Taos County?>**
71	Acequia Subcommittee, Carlos Miera recorder	Section 5.2, Page 15, 4th paragraph	Smaller reservoirs: Cabresto lake? Randal Reservoir-Talpa Reservoir... all play an important role in water storage/usage and model for other potential small reservoir systems.
72	Acequia Subcommittee, Carlos Miera recorder	Section 5.2, Page 15, last paragraph	Sorry to say. Don't know where Carson Reservoir is? Information on Cabresto Lake, Talpa Reservoir and Randall Reservoir (other) data would be helpful to know for water planning purposes. What about mountain lakes? for storage purposes and feasibility? Tourists.....
73	Acequia Subcommittee, Carlos Miera recorder	Section 5.3, 1st paragraph	101 water systems? are we still in Taos County? # of domestic wells in region? SEO should have this data, que no?

Taos Regional Water Plan Compilation of Comments on Draft Plan

No.	Comment Source	Location (Section/Page/ Paragraph)	Comments
74	Acequia Subcommittee, Carlos Miera recorder	Section 5.3.2, Page 20, 2nd to last bullet	would data be the same for the Carson area, Three Peak, Two Peaks, etc., areas with projected growth.
75	Acequia Subcommittee, Carlos Miera recorder	Section 5.3.2, Page 20, last bullet	"Mutual domestic systems also operate wells throughout the region."**<?? How many, served? >**
76	Acequia Subcommittee, Carlos Miera recorder	Figure 5-13	Rio Hondo, show impairment starting at mouth of canyon? Impact of TSV and Taos East?
77	Acequia Subcommittee, Carlos Miera recorder	Section 5.4, Page 21, 1st paragraph	This is not all Table 5-8 shows. poor interpretation, list of tables and narrative don't match. ? Need to review further. use Rio Hondo as an example...
78	Acequia Subcommittee, Carlos Miera recorder	Page 23, 2nd paragraph	"...simple filters for domestic wells or treatment systems for community wells may be used to mitigate health effects." **<Is this statement supported by fact; reverse osmosis? ensure adequately addressed>**
79	Acequia Subcommittee, Carlos Miera recorder	Page 23, 4th paragraph	"Since the accepted plan was published, additional watershed planning and restoration efforts have been undertaken for Embudo Creek..." **<what are those efforts and do they need to be updated? Santa Barbara, Rio Pueblo or is this Embudo Creek?>**
80	Acequia Subcommittee, Carlos Miera recorder	Page 23, last paragraph	Does not specifically describe locally what is happening in regards to these issues. Cannot develop program or policy without specifics. appears boilerplate language.
81	Acequia Subcommittee, Carlos Miera recorder	Section 5.5, 2nd paragraph	no 5.6.2 ? Hard to follow without reference back available water supply. This balance is not fully discussed
82	Acequia Subcommittee, Carlos Miera recorder	Section 5.5.1	The total amount available versus the projected need is the heart of water planning. How will projected need be met without impacting acequias and parciente water rights?
83	Acequia Subcommittee, Carlos Miera recorder	Section 5.5.2, Page 25, 1st bullet	This is a dangerous assumption. Wells have gone dry in Des Montes area, both from drought and increased demand.
84	Acequia Subcommittee, Carlos Miera recorder	Section 5.5.2, Page 25, 1st paragraph after bullets	Concern of using only one site to generalized for entire region?
85	Acequia Subcommittee, Carlos Miera recorder	Section 5.5.2, Page 25, last paragraph	opportunity for program development? Talpa/Randall Reservoir?
86	Acequia Subcommittee, Carlos Miera recorder	Section 6.1, 1st paragraph	Section 5.4 is Water Quality Assessment
87	Acequia Subcommittee, Carlos Miera recorder	Section 6.1, 1st paragraph after bullets	Need to review further

Taos Regional Water Plan Compilation of Comments on Draft Plan

No.	Comment Source	Location (Section/Page/ Paragraph)	Comments
88	Acequia Subcommittee, Carlos Miera recorder	Section 6.1, 2nd paragraph after bullets	Is this considered part of commercial uses? what abut Sipapu Ski Area?
89	Acequia Subcommittee, Carlos Miera recorder	Section 6.1, Page 27, 2nd bullet	in order to avoid making false generalized policies for in stream flow, each stream system need to be looked at individually. Increased tourism -vs- increased agriculture? greatest benefit to local population. Tourism benefits need to be explored/discussed in detail.
90	Acequia Subcommittee, Carlos Miera recorder	Page 28, 2nd complete paragraph	Government and non-profit sector omitted; State/Fed agencies-schools and non-profits make up a large sector of the job market. Job market in sub-regions?
91	Acequia Subcommittee, Carlos Miera recorder	Page 28, last paragraph	Consequence of increased tourism.
92	Acequia Subcommittee, Carlos Miera recorder	Page 28-29	impacts of Tourism. The number of people living in poverty has increased, over the past 20 years.
93	Acequia Subcommittee, Carlos Miera recorder	Page 29, 1st complete paragraph	review Taos News article on importing workers as opposed to developing local work force.
94	Acequia Subcommittee, Carlos Miera recorder	Page 29, 3rd complete paragraph	Efforts by Agriculture Resolution Team to revitalize the agricultural economy and thus preserve water rights (increased usage)
95	Acequia Subcommittee, Carlos Miera recorder	Page 29, 4th complete paragraph	Where are the Tables? list of tables does not show a 3-1d What is the source for this data? Not all agricultural benefits can be measured. Private use and barter system.
96	Acequia Subcommittee, Carlos Miera recorder	Page 29, last paragraph	Also, lack of cattle grazing permits in Carson National Forest for small ranchers. FS policy to award permits to larger herds. Some out of Colorado?
97	Acequia Subcommittee, Carlos Miera recorder	Page 29-30	In search of employment opportunities outside the tourist industry.
98	Acequia Subcommittee, Carlos Miera recorder	Page 30-31	population projections does not address population projections for Penasco area, or fully address population expansion west of the gorge, and their lack of water.
99	Acequia Subcommittee, Carlos Miera recorder	Page 33, 2nd paragraph	Still needs to be developed. Review 2008 Water Plan
100	Acequia Subcommittee, Carlos Miera recorder	Page 36, 2nd paragraph	Need for water storage systems?
101	Acequia Subcommittee, Carlos Miera recorder	Section 6.5.2, 4th paragraph	The potential loss of agricultural status, will result in increased use of the available water supply.

Taos Regional Water Plan Compilation of Comments on Draft Plan

No.	Comment Source	Location (Section/Page/ Paragraph)	Comments
102	Acequia Subcommittee, Carlos Miera recorder	Section 6.5.2, 5th paragraph	Sad but could be true. high cost of replacement cattle and lack of grazing permits for small ranchers.
103	Acequia Subcommittee, Carlos Miera recorder	Section 7, 1st bullet	Need to develop. Abeyta Settlement included language that would not limit the development of small reservoirs.
104	Tony Benson	Section 5,GW wells Fig 5-11	Should say that water levels are recovering in some wells in the Sunshine Valley.

Appendix 6-A

List of Individuals Interviewed

Appendix 6-A. List of Individuals Interviewed Taos Water Planning Region

Name	Title	Organization	City
Fred Peralta	Councilor	Town of Taos	Taos
Martha Perkins	Planning Director	Town of Taos	Taos
Chris Stagg	Vice President	Taos Ski Valley Inc.	Taos Ski Valley
Jason Pfeiffer	Director	Taos Entrepreneurial Network	Taos
Bill Stevens	Researcher	Taos County Chamber of Commerce	Taos
Richard Schlarbaum	Researcher	Taos County Chamber of Commerce	Taos
Liz Beth Walker	Representative	USDA NCRS	Santa Fe
Phil Howard	General Manager	Chevron Mine	Taos
Nathan Sanchez	Chief Planner	Taos County	Taos
Mark Cowan	Chief Appraiser	Mark Cowan & Associates	Taos
Russell Church	Environmental Compliance Director	Town of Red River	Red River
Duncan Sill	Economic Director	NCNM EDD	Santa Fe

Appendix 6-B

Projected Population Growth Rates 2010 to 2040

Appendix 6-B. BBER Projected Five-Year Population Growth Rates, 2010 to 2040 Taos Water Planning Region

County	Five-Year Growth Rate (%)					
	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040
Taos	6.30	5.02	3.85	2.72	1.60	0.53

Source: New Mexico County Population Projections, July 1, 2010 to July 1, 2040.
Geospatial and Population Studies Group, Bureau of Business & Economic Research,
University of New Mexico. Released November 2012.

Appendix 8-A

Recommended Projects, Programs, and Policies

Regional Water Planning Update

Projects, Programs, and Policies 6/28/2016

Water Planning Region: Taos

County	Regional (R) or System-Specific (SS)	Strategy Type (Project, Program, or Policy)	Category	Project Name	Source of Project Information	Description	Project Lead (Entity or Organization)	Partners (Other Entities or Participants)	Timeframe (Fiscal Year)	Planning Phase	Cost	Need or Reason for the Project, Program, or Policy	Comments
Taos	R	Project	Watershed Restoration	Taos County Wetland Action Plan	Steering Committee, see Table 8-2	NMED is working with organizations and local governments to develop regional wetland action plans. There is potential federal funding available to draft these plans. Rehabilitation cost share programs are supported by NRCS and Taos SWCD. This project would include: • Develop a Wetland Action Plan to identify wetlands on public and private lands in the planning region, identify priorities for protection and restoration, and establish a robust public outreach, education, and private landowner engagement strategy. • Identify and encourage incentives for private landowners in the planning area to protect and restore wetlands on their property; some specific avenues to consider would be conservation easements, mitigation banking, and a preferential property tax mechanism.	A key collaborative project from the Steering Committee. Project lead is Amigos Bravos.	Taos SWCD, Taos Land Trust, Carson Forest Service, Town of Taos (Bacapark), Taos County, NMED			Unknown		
Taos	R	Project	Acequia Infrastructure	Preservation and Capacity Building for Acequias, Including Education and Outreach	Steering Committee, see Table 8-2	This project intends to protect acequia water rights for use within the region, and includes education and outreach on: • Abeyta settlement • Impact of adjudication • Updating acequia bylaws to allow for protection from out of region transfers • Addressing abandonment/forfeiture • Water rights protection/transfer notice procedures; elements of water right subfiles for protection of acequias	A key collaborative project from the Steering Committee. Project lead is Carlos Miera.	NM Acequia Association, Taos Valley Acequia Association, OSE/ISC (for presentation), Taos Chamber of Commerce, Relators Association, Taos County, Taos SWCD, John Shomaker, Taos Pueblo, Municipal government			$150,000		
Taos	R	Project	Water System Infrastructure	Capacity Building for Mutual Domestics and Water and Sanitation Districts	Steering Committee, see Table 8-2	To strengthen the capacity of many small systems, the project includes: - Collaborative regional support for management. - Capacity for metering, maintenance of infrastructure, and extension of - lines and tank. - Capacity to acquire water rights	A key collaborative project from the Steering Committee. Project lead is El Valle de Los Ranchos WSD (Bob Romero)	Cañon MDWCA (Vicente Fernandez), Taos County Commission (Tom Blankenhorn), Andrew Chavez-llano, Arroyo Hondo (Pam and Tom Harris).			Unknown		
Taos	R	Project	Data Collection	Enhanced Recharge Investigations	Steering Committee, see Table 8-2	The projects would involve hydrologic studies to characterize the aquifer and to quantify the water balance for the purpose of enhancing recharge through an infiltration galleries, rainwater collection, stormwater management, acequia recharge, small ponds, or other means. The study would also consider land regulations needed for this effort. The study would be completed by a hydrologist at the Palemon Martinez Ranch.	A key collaborative project from the Steering Committee. Project lead is NMED and Taos SWCD	County (for regulations), Town of Taos, NMSU, WRRI, TVAA/acequias, BLM			$30,000		See Table 8-2
Taos	R	Project	Data Collection	Data Collection/Repository/ Monitoring	Steering Committee, see Table 8-2	This project involves developing a repository of digital (PDF) format data and information as a resource and educational resource for Taos County. Additional monitoring data will be collected and added to the repository over time. Repository data will include: Deep wells for the Abeyta Settlement; Water quality data, including spring sampling, groundwater age data, and geochemistry; groundwater level data; OSE/ISC well data; and NM Bureau of Geology Reports. The project will also include mentoring with Taos High School students. The Taos Soil and Water Conservation District is preparing to initiate and manage this project, with the repository held in their facilities.	A key collaborative project from the Steering Committee. Project lead is Taos SWCD	Town of Taos, Taos County, ISC			$100,000		See Table 8-2
Taos	R	Project	Watershed Restoration	Forest Health and Watershed Restoration (e.g., Rio Grande Water Fund)	Steering Committee, see Table 8-2	This project focuses on: • Stewardship thinning for forest and watershed health. • Landscape-scale restoration across jurisdictional boundaries.	A key collaborative project from the Steering Committee. Project lead is Taos Valley Watershed Coalition (TVWC)	Local state, federal governments, Tribal governments, NGOs, Members of TVMC, Carson National Forest, BLM, NM State Forestry, Taos SWCD, Taos County, Rio Grande Water Fund.			$21,000,000 per year for entire Rio Grande watershed north of Albuquerque (estimated $10 million for Taos County)		

Regional Water Planning Update

Projects, Programs, and Policies 6/28/2016

Water Planning Region: Taos

County	Regional (R) or System-Specific (SS)	Strategy Type (Project, Program, or Policy)	Category	Project Name	Source of Project Information	Description	Project Lead (Entity or Organization)	Partners (Other Entities or Participants)	Timeframe (Fiscal Year)	Planning Phase	Cost	Need or Reason for the Project, Program, or Policy	Comments
Taos	R	Project	Watershed Restoration	Climate Change Resilience	Steering Committee, see Table 8-2	• Projects under the Rio Grande Water Fund support climate resilience by restoring forests to a healthy state and protecting water quality. The Wetland Action Plan also supports this project by preserving and restoring headwater wetlands—the sponges of our watershed. • Carson National Forest has policies to protect wetlands.	A key collaborative project from the Steering Committee. Project lead is TVWC, Amigos Bravos, Taos Land Trust	NMED, Carson Nat'l Forest.			Unknown		
Taos	R	Project	Watershed Restoration	Implement County Wildfire Protection Plan	Steering Committee, see Table 8-2	Implement and continue CWPP based on current county and local CWPPs; periodically update county and local plans as needed; support local Firewise programs; and pursue and increase available funding for thinning and maintenance programs.	A key collaborative project from the Steering Committee. Project leads are the Town of Taos, Taos SWCD, and El Salto CWPP	Firewise Communities (8), Taos County Planning Department, Local fire departments, USFS, BLM, Taos SWCD			$80,000 (small projects) to $500,000 (large NFL projects)		See Table 8-2
Taos	SS	Project	Acequia Infrastructure	Acequecita de Penasco Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequecita de Penasco (Main headgate)	Acequecita de Penasco			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	Acequia Del Llano de San Juan Nepomucero Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia Del Llano de San Juan Nepomucero (Adverse grade)	Acequia Del Llano de San Juan Nepomucero			Pre-Planning		Adverse grade	
Taos	SS	Project	Acequia Infrastructure	Acequia del Medio del Rio Lucio Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia del Medio del Rio Lucio	Acequia Del Medio de Rio Lucio			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Abajo de Elvalle Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Abajo del Valle	Acequia Abajo del Valle			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Abajo la Loma Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Abajo la Loma	Acequia Abajo la Loma			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Aguilar Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Aguilar (Pipe)	Acequia Aguilar			Pre-Planning		Pipe	
Taos	SS	Project	Acequia Infrastructure	Acequia Arriba de Elvalle Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Arriba de Elvalle (Farm Headgates)	Acequia Arriba del Valle			Pre-Planning		Farm Headgates	
Taos	SS	Project	Acequia Infrastructure	Acequia Cañon Norte Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Cañon Norte	Acequia Cañon Norte			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Chiquita Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Chiquita (Main headgate)	Acequia Chiquita			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	Acequia Chiquita de La Otra Banda Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Chiquita de La Otra Banda	Acequia Chiquita de La Otra Banda			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia de la Plaza Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia de la Plaza (Dam leakage)	Acequia de la Plaza			Pre-Planning		Dam leakage	
Taos	SS	Project	Acequia Infrastructure	Acequia de Abajo Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia de Abajo	Acequia de Abajo			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia de Atalaya Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements Acequia de Atalaya (Farm Headgates)	Acequia de Atalaya			Pre-Planning		Farm Headgates	
Taos	SS	Project	Acequia Infrastructure	Acequia De Cerro De Guadalupe Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia De Cerro De Guadalupe (Silt removal)	Acequia De Cerro De Guadalupe			Pre-Planning		Silt Removal	
Taos	SS	Project	Water System Infrastructure	Acequia De Chamisal y Ojito Excavator	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To purchase and equip an excavator for the Acequia de Chamisal y Ojito in Taos county	Acequia De Chamisal Y Ojito Excavator				$40,000		

Regional Water Planning Update

Projects, Programs, and Policies 6/28/2016

Water Planning Region: Taos

County	Regional (R) or System-Specific (SS)	Strategy Type (Project, Program, or Policy)	Category	Project Name	Source of Project Information	Description	Project Lead (Entity or Organization)	Partners (Other Entities or Participants)	Timeframe (Fiscal Year)	Planning Phase	Cost	Need or Reason for the Project, Program, or Policy	Comments
Taos	SS	Project	Acequia Infrastructure	Acequia de Jose Venito Martinez Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia de Jose Venito Martinez	Acequia de Jose Venito Martinez			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia de La Ciénega Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia de La Ciénega	Acequia de La Ciénega			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia de La Ciénega Ojito Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia de La Ciénega (Ojito)	Acequia de La Ciénega (Ojito)			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia de la Otra Banda Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia de la Otra Banda	Acequia de la Otra Banda			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia De La Plaza Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia De La Plaza	Acequia de La Plaza			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia De Las Laderitas Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia De Las Laderitas (Silt Removal)	Acequia De Las Laderitas			Pre-Planning		Silt Removal	
Taos	SS	Project	Water System Infrastructure	Acequia De Llano San Juan De Nepomuceno Pipeline	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct a pipeline for the acequia de Llano de San Juan de Nepomuceno in Taos county	Acequia De Llano San Juan De Nepomuceno Pipeline				$177,647		
Taos	SS	Project	Acequia Infrastructure	Acequia de los Gallegos Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia de los Gallegos (Dam leakage)	Acequia de los Gallegos			Pre-Planning		Dam leakage	
Taos	SS	Project	Acequia Infrastructure	Acequia de los Lovatos Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia de los Lovatos (Diversion Dam)	Acequia de los Lovatos			Pre-Planning		Diversion Dam	
Taos	SS	Project	Acequia Infrastructure	Acequia de los Molinos Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia de los Molinos (Widening acequia)	Acequia de los Molinos			Pre-Planning		Widening acequia	
Taos	SS	Project	Acequia Infrastructure	Acequia de Los Pajones Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia de Los Pajones (Farm Headgates)	Acequia de Los Pajones			Pre-Planning		Farm Headgates	
Taos	SS	Project	Acequia Infrastructure	Acequia de los Prandos Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia de los Prandos (Farm Headgates)	Acequia de los Prandos			Pre-Planning		Farm Headgates	
Taos	SS	Project	Acequia Infrastructure	Acequia de los Sanchez Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia de los Sanchez	Acequia de los Sanchez			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia de San Antonio de Valdez Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia de San Antonio de Valdez (Widening acequia)	Acequia de San Antonio de Valdez			Pre-Planning		Widening acequia	
Taos	SS	Project	Acequia Infrastructure	Acequia de Tio Geruacio Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia de Tio Geruacio (Banks)	Acequia de Tio Geruacio			Pre-Planning		Banks	
Taos	SS	Project	Acequia Infrastructure	Acequia del Cañon Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia del Cañon (Diversion Dam)	Acequia del Cañon			Pre-Planning		Diversion Dam	
Taos	SS	Project	Acequia Infrastructure	Acequia de Ojito Y Chamisal Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia del Cañon Ojito Y Chamisal	Acequia del Canon Ojito Y Chamisal			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Carsalito Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia del Carsalito	Acequia del Carsalito			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Lino Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia del Lino	Acequia del Lino			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Del Llano Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Del Llano (Dam leakage)	Acequia Del Llano			Pre-Planning		Dam leakage	
Taos	SS	Project	Acequia Infrastructure	Acequia del Llano de la Yegua Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia Llano de la Yegua (Farm headgates)	Acequia Del Llano de La Yegua			Pre-Planning		Farm Headgates	

Regional Water Planning Update

Projects, Programs, and Policies 6/28/2016

Water Planning Region: Taos

County	Regional (R) or System-Specific (SS)	Strategy Type (Project, Program, or Policy)	Category	Project Name	Source of Project Information	Description	Project Lead (Entity or Organization)	Partners (Other Entities or Participants)	Timeframe (Fiscal Year)	Planning Phase	Cost	Need or Reason for the Project, Program, or Policy	Comments
Taos	SS	Project	Acequia Infrastructure	Acequia del Llano de San Juan Nepomuceno Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia del Llano de San Juan Nepomuceno	Acequia del Llano de San Juan Nepomuceno			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Llano Largo Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia del Llano Largo	Acequia del Llano Largo			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Medio Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia del Medio	Acequia del Medio			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Medio de El Prado Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia del Medio de El Prado (Main headgate)	Acequia del Medio de El Prado			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	Acequia del Molino Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia del Molino	Acequia del Molino			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Molino (Ojito) Improvements	Statewide Acequia Survey, NMAA	Acequia del Molino (Ojito) Improvements	Acequia del Molino (Ojito)			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Molino Río Lucío Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia del Molino (Río Lucío	Acequia del Molino (Río Lucío			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Monte Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements Acequia del Monte	Acequia del Monte			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Monte del Rio Chiquito Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia del Monte del Rio Chiquito (Main headgate)	Acequia del Monte del Rio Chiquito			Pre-Planning	$ 60,000.00	Install 3 new headgates, fix 3 headgates Cost Est: $60,000 Design	
Taos	SS	Project	Water System Infrastructure	Acequia Del Monte Del Rio Chiquito Compuertas	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct compuertas for the acequia del Monte del Rio Chiquito in Taos county	Acequia Del Monte Del Rio Chiquito Compuertas				$30,000		
Taos	SS	Project	Water System Infrastructure	Acequia Del Monte Del Rio Chiquito Dam Improve	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct dam improvements for the acequia del Monte del Rio Chiquito in Taos county	Acequia Del Monte Del Rio Chiquito Dam Improve				$100,000		
Taos	SS	Project	Water System Infrastructure	Acequia Del Monte Del Rio Chiquito Improve	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct improvements to the acequia del Monte del Rio Chiquito in Taos county	Acequia Del Monte Del Rio Chiquito Improve				$60,000		
Taos	SS	Project	Acequia Infrastructure	Acequia del Norte de Las Trampas Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia del Norte de Las Trampas	Acequia del Norte de Las Trampas			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Norte de Río Lucío Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia del Norte de Río Lucío	Acequia del Norte de Río Lucío			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Ojito Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia del Ojito	Acequia del Ojito			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del Pueblo de Picurís Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia del Pueblo de Picurís	Acequia del Pueblo de Picurís			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia del riot del Medio Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia del Rito del Medio (Dam leakage)	Acequia del Rito del Medio			Pre-Planning		Dam leakage	
Taos	SS	Project	Acequia Infrastructure	Acequia Del Sur de La Placita Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia Del Sur de La Placita (Culverts culverts)	Acequia Del Sur de La Placita			Pre-Planning		Culverts	
Taos	SS	Project	Acequia Infrastructure	Acequia del Sur de Las Trampas Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia del Sur de Las Trampas	Acequia del Sur de Las Trampas			Pre-Planning			

Regional Water Planning Update

Projects, Programs, and Policies 6/28/2016

Water Planning Region: Taos

County	Regional (R) or System-Specific (SS)	Strategy Type (Project, Program, or Policy)	Category	Project Name	Source of Project Information	Description	Project Lead (Entity or Organization)	Partners (Other Entities or Participants)	Timeframe (Fiscal Year)	Planning Phase	Cost	Need or Reason for the Project, Program, or Policy	Comments
Taos	SS	Project	Acequia Infrastructure	Acequia del Tio Gervacio Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia del Tio Gervacio	Acequia del Tio Gervacio			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia en Medio las Rios Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia en Medio las Ritos	Acequia en Medio las Rios			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Jarosa Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Jarosa (Diversion Dam)	Acequia Jarosa			Pre-Planning		Diversion Dam	
Taos	SS	Project	Acequia Infrastructure	Acequia La Chiquita (Ojito) Improvements	Statewide Acequia Survey, NMAA	Acequia La Chiquita (Ojito) Improvements	Acequia La Chiquita (Ojito)			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia la Cuchilla Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia la Cuchilla	Acequia la Cuchilla			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Leña Pesada Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Leña Pesada	Acequia Leña Pesada			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Llano de San Miguel Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Llano de San Miguel	Acequia Llano de San Miguel			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia los Sanchez Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia los Sanchez (Main headgate)	Acequia los Sanchez			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	Acequia Madre de Cerro Guadalupe Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Madre de Cerro Guadalupe	Acequia Madre de Cerro Guadalupe			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Madre de Cerro Guadalupe Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Madre de Cerro Guadalupe (Silt Removal)	Acequia Madre de Cerro Guadalupe			Pre-Planning		Silt Removal	
Taos	SS	Project	Acequia Infrastructure	Acequia Madre de Chamisal Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Madre de Chamisal (Divider)	Acequia Madre de Chamisal			Pre-Planning		Divider	
Taos	SS	Project	Acequia Infrastructure	Acequia Madre de El Prado Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Madre de El Prado	Acequia Madre de El Prado			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Madre de la Lloma del Ranchito Abajo Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Madre de la Lloma del Ranchito Abajo	Acequia Madre de la Lloma del Ranchito Abajo			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Madre de la Loma/S. Loma Lateral Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia Madre de la Loma/S. Loma Lateral (Desague repair)	Acequia Madre de la Loma/S. Loma Lateral			Pre-Planning		Desague repair	
Taos	SS	Project	Acequia Infrastructure	Acequia Madre de la Otra Banda Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Madre de la Otra Banda (Main headgate)	Acequia Madre de la Otra Banda			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	Acequia Madre de Rio Costilla Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Madre de Rio Costilla (Acequia Lining)	Acequia Madre de Rio Costilla			Pre-Planning		Acequia Lining	
Taos	SS	Project	Acequia Infrastructure	Acequia Madre de Rio Lucero y de Arroyo Seco	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Madre de Rio Lucero y de Arroyo Seco	Acequia Madre de Rio Lucero y de Arroyo Seco			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Madre de Santa Barbara Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia Madre de Santa Barbara (Main headgate)	Acequia Madre de Santa Barbara			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	Acequia Madre Del El Prado Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia Madre Del El Prado (Farm headgates)	Acequia Madre Del El Prado			Pre-Planning		Farm Headgates	
Taos	SS	Project	Acequia Infrastructure	Acequia Madre del Llano Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Madre del Llano	Acequia Madre del Llano			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Madre del Norte del Canon Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Madre del Norte del Canon	Acequia Madre del Norte del Canon			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Madre Del Penasco Sur Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia Madre Del Penasco Sur (Main headgate)	Acequia Madre Del Penasco Sur			Pre-Planning		Main headgate	

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Taos	SS	Project	Acequia Infrastructure	Acequia Madre del Pueblo Improvements	NMAA	Acequia Madre del Pueblo Improvements	Acequia Madre del Pueblo					Waiting to receive the design.	
Taos	SS	Project	Acequia Infrastructure	Acequia Madre del Rio Chiquito Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Madre del Rio Chiquito	Acequia Madre del Rio Chiquito			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Madre del Rio Grande del Rancho Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Madre del Rio Grande del Rancho	Acequia Madre del Rio Grande del Rancho			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Water Rights Protection	AMDRGDR, John Gonzales	The Acequia Madre Del Rio Grande Del Rancho (AMDRGDR) will develop a program to educate the members of the acequia on the importance of making beneficial use of water rights and/or water bank with the acequia. The AMDRGDR will also develop a program to purchase water rights whenever possible. the AMDRGDR will seek funds to conduct an education campaign, to contact members, and to map the acequia and its property owners	Acequia Madre Del Rio Grande Del Rancho -- John B. Gonzales	Taos County Soil-Water Conservation District (TCSWCD)	Anticipated to be complete in a 5-year period		Unknown		potential funding: NM state, Taos County Soil-Water Conservation District
Taos	SS	Project	Acequia Infrastructure	Water Systems Infrastructure: Diversion Dam and culvert	AMDRGDR, John Gonzales	A maintenance project and application is pending with the Taos County Soil and Water Conservation District for the main diversion dam and head gate at the beginning of the Acequia Madre Del Rio Grande Del Rancho. The Project will also require the repair or replacement of a subterranean concrete culvert under the Rio Grande Del Rancho that conveys water from the head gate to the main stem of the acequia.	Acequia Madre Del Rio Grande Del Rancho -- John B. Gonzales, (505) 350-2729 -- jbgonzales@hotmail.com	Taos County Soil-Water Conservation District (TCSWCD)	Anticipated to be complete in a 5-year period	Main Diversion Dam: Application stage. Culvert: initial planning stage	Main diversion dam and head gate: $250,000 - $300,000. Culvert Repair: Unknown		Potential funding: NM state, Taos County Soil-Water Conservation District
Taos	SS	Project	Acequia Infrastructure	Water Systems Infrastructure: smaller projects	AMDRGDR, John Gonzales	Various smaller projects along the Acequia Madre Del Rio Grande Del Rancho, including four head gates, a spillway from the head gate area back into the river, 40 feet of culvert to prevent erosion; due to the layout of the acequia, excessive and dangerous flooding to private property and homes is a possibility.	Acequia Madre Del Rio Grande Del Rancho -- John B. Gonzales, (505) 350-2729 -- jbgonzales@hotmail.com	Taos County Soil-Water Conservation District (TCSWCD)	Anticipated to be complete in a 5-year period		Head gates: ~ $9000, culvert and spillway costs unknown		Potential funding: NM state, Taos County Soil-Water Conservation District
Taos	SS	Project	Acequia Infrastructure	Acequia madre del Rio Lucio y Arroyo Seco Improvements	Statewide Acequia Survey, NMAA	To plan design, and construct improvements on Acequia Rio Lucio y Arroyo Seco (Farm headgates)	Acequia madre del Rio Lucio y Arroyo Seco			Pre-Planning		Farm Headgates	
Taos	SS	Project	Acequia Infrastructure	Acequia Madre del Sur del Canon Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia Madre del Sur del Canon (Farm Headgates)	Acequia Madre del Sur del Canon			Pre-Planning		Farm Headgates	
Taos	SS	Project	Acequia Infrastructure	Acequia Molino Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia Molino (Main headgate)	Acequia Molino			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	Acequia North side Vadito Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia North side Vadito	Acequia North side Vadito			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Rio Lucio Southside Ditch Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia North side Vadito	Acequia Rio Lucio Southside Ditch/Acequia Del Sur de Rio Lucio			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Saucito Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequia Saucito	Acequia Saucito			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Sebadilla Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequia Sebadilla	Acequia Sebadilla			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequia Sevadilla Improvements	Statewide Acequia Survey, NMAA	Acequia Sevadilla Improvements	Acequia Sevadilla			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Acequias de Chamisal and Ojito Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Acequias de Chamisal and Ojito (Pipe)	Acequias de Chamisal and Ojito			Pre-Planning		Pipe	
Taos	SS	Project	Acequia Infrastructure	Acequiecita de Peñasco Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Acequiecita de Peñasco	Acequiecita de Peñasco			Pre-Planning			

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Taos	SS	Program	Watershed Restoration	Rio Fernando Watershed Based Plan Project	Amigos Bravos, Rachael Conn, Interim Executive Director	The Rio Fernando de Taos, a tributary to the Rio Pueblo de Taos flows through the center of the Taos community. The whole river is not meeting E.coli water quality standards. This project will address the E. coli impairment in all three segments of the Rio Fernando, incorporating the area from the Rio Pueblo de Taos confluence to the headwaters at the top of La Jara Canyon by preparing a Comprehensive Watershed Based Plan (WBP) that identifies sources of pollution and a list of solutions and projects that could be implemented to address the contamination. In developing the WBP we will take a three-pronged approach. The first will be to conduct water quality monitoring – continuing previous work by Water Sentinels and Amigos Bravos – to better characterize the E. coli impairment in the Rio Fernando. The second prong will be the stakeholder and public outreach component. The third prong will be working with watershed stakeholders to draft the plan and identify solutions and projects to address the contamination.	Amigos Bravos	Water Sentinels of Taos, Taos County, Town of Taos, Watershed Stakeholders	This is a 2-year project	A detailed work plan and budget has been prepared for this project. A funding request to NMED was submitted in June of 2014. No final funding determination has been made by NMED on our request.		Development of a watershed based plan to confront high levels of E. coli throughout the system.	
Taos	R	Project	Watershed Restoration	Water Quality Improvement Project – Rio Pueblo de Taos	Amigos Bravos, Rachael Conn, Interim Executive Director	The Rio Pueblo de Taos (RPdT) Watershed covers an area of land draining approximately 400 square miles. The lower portion of the river from the confluence of the Rio Grande del Rancho downstream to the confluence with the Rio Grande is impaired for temperature and nutrients. The goal of this project is to measurably decrease temperature in the RPdT by increasing canopy. Specifically, the goal is to achieve a decrease of at least 335 Joules/m2/s. This goal was developed using the modeling done for the RPdT WBP, which predicted a decrease of at least 335 Joules/m2/s based on canopy increase alone. Channel restoration work (channel narrowing) in the wastewater arroyo and along the main stem will also help in lowering the water temperature by decreasing river width (and therefore surface area exposed to the sun) and keep the water moving more. This will also help with nutrient eutrophication by aerating the water and increasing churning of the bottom. Channel work will also address potential sediment loading from bank cuts. Fencing implementation and wetland creation will help to address nutrient issues coming from the Town of Taos Wastewater Treatment plant outflow stream and from grazing along the main stem. In addition, fencing will protect riparian vegetation growth, increase canopy cover, and result in a decrease in water temperature. In addition to on-the-ground construction and planting restoration efforts, several specific education campaigns will be essential for achieving our goal of decreasing water temperature in the RPdT. The education/policy outreach efforts will address the whole non-pueblo main stem of the river. Ordinances will be researched and proposed. Education campaigns about river-friendly irrigation hours, beaver ecosystem functions, river-friendly tax deduction options, river buffers, road and subdivision BMPs, and the importance of long-term watershed stewardship will be essential in educating stakeholders about actions that can be taken both at an individual level as well as at a community level for reducing temperature impacts to the RPdT.	Amigos Bravos	Keystone Restoration, Town of Taos, Rocky Mountain Youth Corp	This project will take 3.5 years to complete	Detailed work plans have been developed for this project. A funding request to NMED was submitted for this project for 319 funds for the last two years. While the project has been a finalist it has not received funding to date.	$288,806	The goal of the project is to measurably decrease the temperature in Rio Pueblo de Taos.	
Taos	SS	Project	Watershed Restoration	Headwater Wetland Gems On-the-Ground Restoration	Amigos Bravos, Rachael Conn, Interim Executive Director	Watersheds with headwaters in the Carson National Forest serve as the majority of surface water resources in the Taos Region. Wetlands are the sponges of our watershed. They provide resiliency in times of both drought and floods. Wetlands store water and release water slowly over the year, instead of all at once during the spring runoff. Headwater wetlands in the Carson National Forest have been identified, ranked and mapped. 8 Wetland Gems have been identified as being essential for providing stream flow to the watersheds that feed Taos area communities. Restoration and protection of these 8 wetlands is essential to protecting the water supply of the Taos region. Once restoration and NEPA planning is complete, on-the-ground restoration can begin.	Amigos Bravos	Carson National Forest, Albuquerque Wildlife Federation	Depending on funding, and completion of necessary planning and NEPA, large scale on the ground restoration could potentially begin in 2017. Limited smaller projects for which NEPA has already been conducted (>$25,000) can begin (and have begun in FY15) prior to additional planning and NEPA.	The necessary planning for this project (planning and NEPA for restoration are a separate project that must be completed first) must be completed prior to implementation on-the-ground restoration efforts. Initial on the ground restoration work on one Wetland Gem (Midnight Meadows) has begun with secured private foundation funding and support from the Carson National Forest. Secured funding: $5,000	Cost estimate to complete on-the-ground restoration for each Wetland Gem: $100,000. Total cost on-the-ground restoration in all 8 Wetland Gems: $800,000	Begin on-the-ground wetland restoration work.	

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Taos	R	Program	Watershed Restoration	Headwater Wetland Gems Restoration Planning	Amigos Bravos, Rachel Conn, Interim Executive Director	Watersheds with headwaters in the Carson National Forest serve as the majority of surface water resources in the Taos Region. Wetlands are the sponges of our watershed. They provide resiliency in resources in the Taos Region. Wetlands store water and release water slowly over the year, instead of all at once during the spring runoff. Headwater wetlands in the Carson National Forest have been identified, ranked, and mapped. Eight Wetland Gems have been identified as being essential for providing stream flow to the watersheds that feed Taos area communities. Restoration and protection of these 8 wetlands is essential to protecting the water supply of the Taos region. Detailed restoration plans, NEPA planning, and obtaining the necessary permits for restoration activities will need to be conducted.	Amigos Bravos	Carson National Forest, Western Environmental Law Center	Depending on funding, planning on 2 of the 8 Wetland Gems would be conducted in FY 16, planning on remaining 6 would be complete by end of FY 18. Funding request: Initial planning on one Wetland Gem has begun with secured private foundation funding and support from the Carson National Forest. Estimated cost of initial efforts: $8,000.	This is a planning project. Necessary planning including inventory of impacts to wetland gems such as head cuts, roads, etc., development of detailed restoration plans, and NEPA will need be conducted for each GEM After NEPA is conducted, necessary Clean Water Act permits will need to be obtained.	For planning including NEPA for each Wetland Gem: $50,000. Total for planning including NEPA on all 8 Wetland Gems: $400,000	Restoration and protection of these 8 wetlands is essential to protecting the water supply of the Taos region.	
Taos	SS	Project	Acequia Infrastructure	Anderson Ditch Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Anderson Ditch (Diversion Dam)	Anderson Ditch			Pre-Planning		Diversion Dam	
Taos	SS	Project	Acequia Infrastructure	Borrego and Molina Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Borrego and Molina	Borrego and Molina			Pre-Planning			
Taos	SS	Project	Water System Infrastructure	Cabresto Dam Liner	Cabresto Lake Irrigation, Esther Garcia, Treasurer	Cabresto Dam needs a liner so that we can store water.	Cabresto Lake Irrigation	Cabresto Lake Irrigation, Community Ditch Association, Llano Community Ditch		Preliminary request for funding from the state legislature	$5,500,000	water storage	
Taos	SS	Project	Acequia Infrastructure	Cabresto Lake Irrigation Community Ditch Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia Lake Irrigation Community Ditch (Diversion dam)	Cabresto Lake Irrigation Community Ditch			Pre-Planning		Diversion Dam	
Taos	SS	Project	Water System Infrastructure	Canon MDWCA Storage Expansion	Canon MDWCA, Vincente O. Fernandez, President	Additional 100,000 gallon storage expansion; acquire 1/2 acre of land; replace old water lines along US 64; drill new well; buy additional meters	Canon MDWCA		2018 or 2019	Grant request in FY16	$3,000,000	additional water storage required	
Taos	SS	Project	Acequia Infrastructure	Cerro de Guadalupe Acequia Improvements	ICIP 2017	To plan, design, and construct improvements to Cerro de Guadalupe Acequia including ditch lining	Cerro de Guadalupe Acequia			ICIP 2017, Needs design	$250,000	Install approximately 5 miles of ditch lining, No Design, Cost Est: $250,000	
Taos	SS	Project	Water System Infrastructure	Cerro De Guadalupe Acequia Association Improve	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct water system improvements for the Cerro de Guadalupe acequia association in Taos county	Cerro De Guadalupe Acequia Association Improve				$250,000		
Taos	SS	Project	Water System Infrastructure	Cerro Regional MDWC & SWA Water Sys Improve	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct water system improvements for Cerro regional mutual domestic water consumers and sewage works association in Cerro in Taos county	Cerro Regional MDWC & SWA Water Sys Improve				$100,000		
Taos	SS	Project	Water System Infrastructure	Hook up Most Western Residents Beginning from Cerro School	Cerro Regional Mutual Domestic Water Consumers Association, Vilma Bailon, President	(1) Install 1.5 mi of 6-inch water line to Well #2. (2) Install main shutoff valves every 700 feet or so. (3) Install shutoff valves and meters to homes and hook up to water system (2nd 35 residences from project #2). Result: Well #2 is main and Well #1 is backup.	Cerro Regional Mutual Domestic Water Consumers Association		After Projects 1 and 2 completed and funding is acquired. Funding request: Capital Outlay, grants and loans.	Part of the 40 year plan.	$1,000,000		
Taos	SS	Project	Water System Infrastructure	Shutoff Valves, Meters, and Additional Hook ups	Cerro Regional Mutual Domestic Water Consumers Association, Vilma Bailon, President	Completed: Well #1, 30,000 gallon tank & existing water lines to 70 residences, Well #2 and 1mi of 6 in water line. Project: Install shutoff valves and meters, and hook up Well #2 to 35 of the 70 residences above.	Cerro Regional Mutual Domestic Water Consumers Association		2016-2018	Planning Phase has been in process for awhile. El Rito joined Cerro so we'd like to get them hooked up before proceeding with this project.	$600,000		

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Taos	SS	Project	Water System Infrastructure	El Rito (Latir) water hookup	Cerro Regional Mutual Domestic Water Consumers Association, Vilma Bailon, President	Completed: Well, well house, 20,000gal storage tank, about 1mile of 4in distribution line. Needed: electricity to well, flush water tank and lines, install shutoff valves to residents, install meters and hook up to residents.	Cerro Regional Mutual Domestic Water Consumers Association		After funding received, 6 months to complete in 2015-2016. Funding request: Capital Outlay (currently at Legislature awaiting special session)	See description.	$100,000		
Taos	SS	Project	Water System Infrastructure	Water Meter Replacement, Well Expansion, and 4" Water Line	Chamisal MDWCA, Maximiliano Garcia, President,	The original well of the Chamisal Mutual Domestic Water Consumers Association was established in 1952. In 1988, water meters were installed, and currently all meters are in need of replacement. A second well was installed in 2003. Since, there is a need to expand and we are also in need of 1 mile of a 4" water line in the north school road to provide infrastructure to new members	Chamisal MDWCA		We are in beginning stages, but could move forward easily if funding were made available.	We have only discussed these projects, but do have blueprints readily available for meter replacement.	no estimate available		
Taos	SS	Project	Acequia Infrastructure	Cortez y Sisneros Ditch Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Cortez y Sisneros Ditch	Cortez y Sisneros Ditch			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Dan Archuleta Acequia Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Dan Archuleta Acequia	Dan Archuleta Acequia			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	El Alamito Ditch Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to El Alamito Ditch (Diversion Dam)	El Alamito Ditch			Pre-Planning		Diversion Dam	
Taos	SS	Project	Acequia Infrastructure	El Molino Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements no El Molino (Main headgate)	El Molino			Pre-Planning		Main headgate	
Taos	SS	Project	Water System Infrastructure	El Prado WSD building/water system/fencing improvements	Capital Outlay Database	El Prado WSD building/water system/fencing improvements	El Prado WSD				$50,000		Fund: STB
Taos	SS	Project	Water System Infrastructure	El Prado WSD Facilities/Water Systems Improve	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design, construct and improve the facilities and water systems, including the purchase and installation of fencing and a generator, for El Prado water and sanitation district in El Prado in Taos county	El Prado WSD Facilities/Water Systems Improve				$200,000		
Taos	SS	Project	Water System Infrastructure	Install approximately 1,800 linear feet of 6-inch waterline, connect new lines to existing water storage tank, and install approximately 42 water meters	Mutual Domestic Subcommittee, Ramon Lucero	Install approximately 1,800 linear feet of 6-inch waterline, connect new lines to existing water storage tank, and install approximately 42 water meters	El Rito Canon MDWCA		This is a proposed 10-yr project.				Last 10-yrs project: new water supply well, new pump house and fencing
Taos	SS	Project	Water System Infrastructure	El Salto MDWCA & MSWA water line improve Taos co	Capital Outlay Database	El Salto MDWCA & MSWA water line improve Taos Co	El Salto MDWCA				$25,000		Fund: STB
Taos	SS	Project	Water System Infrastructure	El Salto MDWCA Waterline Replacement	Water Trust Board Database	El Salto MDWCA Waterline Replacement	El Salto MDWCA		FY2015		$700,000		
Taos	SS	Project	Water System Infrastructure	El Salto MDWCA Water Improvement Project	Water Trust Board 2016	Construction	El Salto MDWCA				$250,000		
Taos	SS	Project	Water System Infrastructure	El Valle de los Ranchos WSD sewer sys ph 2D-1A	Capital Outlay Database	El Valle de los Ranchos WSD sewer sys ph 2D-1A	El Valle de los Ranchos WSD				$50,000		Fund: STB
Taos	SS	Project	Water System Infrastructure	El Valle de los Ranchos Waterline Replacement	Water Trust Board Database	El Valle de los Ranchos Waterline Replacement	El Valle de los Ranchos WSD		FY2015		$2,650,000		
Taos	SS	Project	Water System Infrastructure	El Valle De Los Ranchos WSD Sewer Sys Ph 2D-1B	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct phase 2D-1B improvements to the sewer system for El Valle de Los Ranchos water and sanitation district in Taos county	El Valle De Los Ranchos WSD Sewer Sys Ph 2D-1B				$50,000		

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Taos	SS	Project	Water System Infrastructure	El Valle De Los Ranchos WSD Sewer Sys Ph 2D-1C	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct phase 2D-1C improvements to the sewer system for El Valle de Los Ranchos water and sanitation district in Taos county	El Valle De Los Ranchos WSD Sewer Sys Ph 2D-1C				$50,000		
Taos	SS	Project	Water System Infrastructure	El Valle De Los Ranchos WSD Sewer Sys Ph 2D-1D	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct phase 2D-1D improvements to the sewer system for El Valle de Los Ranchos water and sanitation district in Taos county	El Valle De Los Ranchos WSD Sewer Sys Ph 2D-1D				$60,000		
Taos	SS	Project	Acequia Infrastructure	Emilio Chavez /Ponce De Leon Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Emilio Chavez/Ponce de Leon	Emilio Chavez /Ponce De Leon			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Finado Francisco Martinez Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Finado Francisco Martinez (Desague repair)	Finado Francisco Martinez			Pre-Planning		Desague repair	
Taos	SS	Project	Acequia Infrastructure	Jose Venito Martinez Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Jose Venito Martinez (Main headgate)	Jose Venito Martinez			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	Juan M Lucero & M A Trujillo Lower Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia M Lucero & M A Trujillo Lower (Culverts culverts)	Juan M Lucero & M A Trujillo Lower			Pre-Planning		Culverts	
Taos	SS	Project	Acequia Infrastructure	La Acequia de Penasco Del Camino Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on Acequia de Penasco Del Camino (Diversion dam)	La Acequia de Penasco Del Camino			Pre-Planning		Diversion Dam	
Taos	SS	Project	Acequia Infrastructure	La Acequia de Tres Ritos Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements on La Acequia de Tres Ritos (Main headgate)	La Acequia de Tres Ritos			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	La Acequia de Vallecitos Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to La Acequia de Vallecitos (Main headgate)	La Acequia de Vallecitos			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	La Acequia del llano Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to La Acequia del llano	La Acequia del Llano			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	La Acequia Grande Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements La Acequia Grande	La Acequia Grande			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	Lena Pesada Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements da Lena Pesada (Desague repair)	Lena Pesada			Pre-Planning		Desague repair	
Taos	SS	Project	Water System Infrastructure	Replace all waterlines, new 400,000 gallon water storage tank, blend to address fluoride purchase approximately 50 acre-feet of water rights	Mutual Domestic Subcommittee, Ramon Lucero	Replace all waterlines, new 400,000 gallon water storage tank, blend to address fluoride purchase approximately 50 acre-feet of water rights	Llano Quemado MDWCA		This is a proposed 10-yr project.				Last 10 years project: redrill water supply well, fire hydrants and new water storage tank
Taos	SS	Project	Water System Infrastructure	Llano Quemado MDWCA	Mutual Domestic Subcommittee, Ramon Lucero	*Last 10-Years Project*: Redrill water supply well, fire hydrants and new water storage tank. *Proposed 10-Year Projects:* Replace all waterlines, new 400,000 gallon water storage tank, blend to address fluoride purchase approximately 50 acre-feet of water rights	Llano Quemado MDWCA						
Taos	SS	Project	Water System Infrastructure	Llano Quemado MDWCA Water Sys Improve	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design, construct and renovate the Llano Quemado mutual domestic water consumers association water system, including water lines, a water tank and a well, in Llano Quemado in Taos county	Llano Quemado MDWCA Water Sys Improve				$80,000		
Taos	SS	Project	Water System Infrastructure	Lower Arroyo Hondo MDWC & MSWA Water Sys Improv	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct water system improvements for the Lower Arroyo Hondo mutual domestic water consumers and mutual sewage works association in Arroyo Hondo in Taos county	Lower Arroyo Hondo MDWC & MSWA Water Sys Improv				$200,000		

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Taos	SS	Project	Water System Infrastructure	Pump House, Waterline, and Meter Replacement	Water Trust Board Database	Pump house, waterline and meter replacement.	Lower Arroyo Hondo MDWCA		FY2015		$783,793		
Taos	SS	Project	Water System Infrastructure	Lower Arroyo Hondo Water System Improvement Project	Water Trust Board 2016	Construction	Lower Arroyo Hondo MDWCA				$774,205		
Taos	SS	Project	Water System Infrastructure	Waterlines, water meters, electrical system, additional water storage tank, supplemental well and telemetry system	Mutual Domestic Subcommittee, Ramon Lucero	Waterlines, water meters, electrical system, additional water storage tank, supplemental well and telemetry system	Lower Des Montes MDWCA		This is a proposed 10-yr project.				Last 10-yrs project: water storage tank rehabilitation, replace broken waterlines
Taos	SS	Project	Water System Infrastructure	Lower Des Montes MDWCA Improvements	Mutual Domestic Subcommittee, Ramon Lucero	*Last 10-Years Project*: Water storage tank rehabilitation, replace broken waterlines. *Proposed 10-Year Projects:* Waterlines, water meters, electrical system, additional water storage tank, supplemental well and telemetry system	Lower Des Montes MDWCA						
Taos	SS	Project	Water System Infrastructure	Rehabilitation of Water Tank	Water Trust Board Database	Rehabilitation of water tank.	Lower Des Montes MDWCA		FY2015		$990,000		
Taos	SS	Project	Acequia Infrastructure	Manuel Andres Trujillo Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Manuel Andres Trujillo (Silt Removal)	Manuel Andres Trujillo			Pre-Planning		Silt Removal	
Taos	SS	Project	Acequia Infrastructure	Manuel Andres Trujillo Upper Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Manuel Andres Trujillo Upper	Manuel Andres Trujillo Upper			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	McClure Ditch Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to McClure Ditch	McClure Ditch			Pre-Planning			
Taos	SS	Project	Water System Infrastructure	Uranium treatment facility, rehabilitate existing water supply wells, and replace PRVs	Mutual Domestic Subcommittee, Ramon Lucero	Uranium treatment facility, rehabilitate existing water supply wells, and replace PRVs	Ojo Caliente MDWCA		This is a proposed 10-yr project.				
Taos	SS	Project	Acequia Infrastructure	Pacheco Community Ditch Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Pacheco Community Ditch	Pacheco Community Ditch			Pre-Planning			
Taos	SS	Project	Water System Infrastructure	Adjudicate water rights, replace existing 4-inch waterlines with 6-inch waterlines. Work on regional wastewater system	Mutual Domestic Subcommittee, Ramon Lucero	*Last 10-Years Project:* Replace entire system within the last ten years *Proposed 10-Year Projects:* Adjudicate water rights, replace existing 4-inch waterlines with 6-inch waterlines. Work on regional wastewater system.	Peñasco MDWCA						
Taos	SS	Project	Acequia Infrastructure	Questa Citizens Ditch Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Questa Citizens Ditch	Questa Citizens Ditch			Pre-Planning			
Taos	SS	Project	Acequia Infrastructure	South Diversion of the Questa Citizens Ditch Association acequia network reconstruction	Questa Citizens Ditch Association, Malaquias Rael, Board Member	The South Diversion of the Questa Citizens Ditch Association acequia network is in need of reconstruction fro the purposes of proper function and water conservation efficiency.	Questa Citizens Ditch Association	Village of Questa, Questa Economic Development Funding Board.	1yr. Funding request: Indicate when a request for funding will be submitted (fiscal year) and source of funding. $80,000.	A budget and design has been prepared for this project. This project is shovel-ready.	Given the breadth of potential projects and water needs, the total cost of this project is estimated to be 160,000.		
Taos	SS	Project	Water System Infrastructure	Questa Sewer Lines Taos Co	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design, construct, improve and extend sewer lines in Questa in Taos county	Questa Sewer Lines Taos Co				$2,400,000		
Taos	SS	Project	Water Rights Purchase	Questa Water Rights Purchase Taos Co	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan and purchase water rights for Questa in Taos county	Questa Water Rights Purchase Taos Co				$500,000		

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Taos	SS	Project	Water System Infrastructure	Questa Water System Construct Taos Co	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To acquire land and to plan, design, construct and improve the water system in Questa	Questa Water System Construct Taos Co				$1,509,950		
Taos	SS	Project	Acequia Infrastructure	Randall Reservoir Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements Randall Reservoir (Water Storage)	Randall Reservoir			Pre-Planning		Water Storage	
Taos	SS	Project	Water System Infrastructure	Red River Wastewater Treatment Facility	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design, construct and improve the wastewater treatment facility in Red River	Red River Wastewater Treatment Facility				$4,062,000		
Taos	SS	Project	Water System Infrastructure	Red River Water System & Meters Replace	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct improvements and to purchase and install water meters for the municipal water system in Red River	Red River Water System & Meters Replace				$175,000		
Taos	SS	Project	Water System Infrastructure	Red River Water Tank & Water System Improve	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct a water tank and water system improvements in Red River	Red River Water Tank & Water System Improve				$1,900,000		
Taos	SS	Project	Acequia Infrastructure	Revalse Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements se Revalse (Diversion Dam)	Revalse			Pre-Planning		Diversion Dam	
Taos	SS	Project	Water System Infrastructure	Revalse Ditch Improve - Taos Co	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct improvements to the Revalse ditch, including the purchase and installation of gates and equipment, in Des Montes	Revalse Ditch Improve - Taos Co				$100,000		
Taos	SS	Project	Acequia Infrastructure	Rio Don Fernando Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Rio Don Fernando (Farm Headgates)	Rio Don Fernando			Pre-Planning		Farm Headgates	
Taos	SS	Project	Water System Infrastructure	Replace 2" water line and connect to Penasco Water Association for emergency preparedness	Rio Lucio MDWCA, Clyde Guruli, President	(1) Replace old 2-inch water line 1,800 ft - old line was originally in since 1963. (2) Install new 6-inch water line 1,000 ft to connect Penasco Water Association to Rio Lucio Association for emergency supply when our water pump is broken. (3) Replace old 2-inch waterline with new 4-inch water line 2,025 ft.	Rio Lucio MDWCA		2016-2017	Grant request in FY16		Replacement of aging water lines and connection to another water association for emergency situations.	
Taos	SS	Project	Acequia Infrastructure	Río Lucío Southside Ditch Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Río Lucío Southside Ditch	Río Lucío Southside Ditch			Pre-Planning			
Taos	SS	Project	Water System Infrastructure	Supplemental water supply well, additional water storage tank, expand existing water distribution system, new waterlines, fence existing well and tank site	Mutual Domestic Subcommittee, Ramon Lucero	Supplemental water supply well, additional water storage tank, expand existing water distribution system, new waterlines, fence existing well and tank site	Rodarte MDWCA		This is a proposed 10-yr project.		$1,200,000		
Taos	SS	Project	Water System Infrastructure	Radio read water meters, new storage tank, altitude valve, chlorination, replace existing infiltration gallery	Mutual Domestic Subcommittee, Ramon Lucero	*Last 10-Years Project:* Replace a portion of the existing filtration system *Proposed 10-Year Projects:* Radio read water meters, new storage tank, altitude valve, chlorination, replace existing infiltration gallery	San Cristobal MDWCA						
Taos	SS	Project	Acequia Infrastructure	San Francisco de Pauda Acequia Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to San Francisco de Pauda Acequia	San Francisco de Pauda Acequia			Pre-Planning			

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Taos	SS	Project	Dam Safety	Dam Safety/ Repairs and Upgrades	OSE Dam Safety Bureau	Dam Safety/Upgrades as defined in RWP Update Table 5-7	See Table 5-7	See Table 5-7			See Table 5-7		See Table 5-7
Taos	SS	Project	Acequia Infrastructure	Sombrilo Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements lo Sombrilo (Diversion Dam)	Sombrilo			Pre-Planning		Diversion Dam	
Taos	SS	Project	Acequia Infrastructure	Spring Ditch Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Spring Ditch	Spring Ditch			Pre-Planning			
Taos	SS	Project	Water System Infrastructure	Talpa irrigation reservoir spillway construct	Capital Outlay Database	Talpa irrigation reservoir spillway construct	Talpa				$50,000		Fund: STB
Taos	SS	Project	Water System Infrastructure	Taos Co Northern NM Land Grants/Acequia Archives	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design, renovate, furnish and equip a facility for the northern New Mexico land grant and acequia archives, including the purchase and installation of information technology and related equipment, furniture and infrastructure	Taos Co Northern NM Land Grants/Acequia Archives				$100,000		
Taos	R	Program	Watershed Restoration	Taos CWPP Projects	The Nature Conservancy, Laura McCarthy, Secretary, Watershed Subcommittee	The Watershed Subcommittee feels it is very important to incorporate by reference the watershed restoration and fire protection projects identified in the Taos County Community Wildfire Protection Plan (CWPP). This plan was completed in 2009 and included several projects list. These are scanned and provided at the end of this document. Most of the projects have been implemented to some degree, however they are not yet at scale and should remain as focal areas. Please note that the CWPP is currently under revision. If a revised project list is completed before the Taos Regional Water Plan is finished, the Watershed Subcommittee may want to substitute the updated list of projects for the attached list.	Taos County	The CWPP Core Team is the partner group, with more than a dozen agencies and organizations represented, including Carson National Forest, BLM, Taos SWCD, NM State Forestry and many others.	Watershed restoration is an ongoing need that takes multiple agencies and organizations to accomplish. The Watershed Subcommittee will coordinate with the existing groups, such as the Taos CWPP Core Team and the Taos Valley Watershed Coalition, to ensure efficient proposal development and implementation. Funding request: Funding for at least one project per year will likely be requested from the Water Trust Board, in amounts ranging from $500,000 to $1 million per year.	Most of the projects have planning completed.	Various costs		
Taos	R	Program	Plan Update	Taos County Hazard Mitigation Plan	Taos County, Nathan Sanchez, Chief Planner	Update the Taos County Hazard Mitigation Plan	Taos County Emergency Manager	Taos County CWPP Committee	2016/2017	There is an RFP out to find a contractor to update the plan	$45,000	Need to update county hazard mitigation plan.	
Taos	R	Program	Plan Update	Taos County Comprehensive Plan	Taos County, Nathan Sanchez, Chief Planner	Update the Taos County Comprehensive Plan	Taos County Planning Department	Taos County Neighborhood, Public, Town of Taos, Questa Village	2016/2017	CDBG Grant 2014/2015	$50,000	Need to update county comprehensive plan.	
Taos	R	Program	Plan Update	Taos County Wildfire Protection Plan (CWPP)	Taos County, Nathan Sanchez, Chief Planner	Update to Taos County Wildfire Protection Plan	Taos County Planning Department	CWPP core team	2016/2017	The Taos county CWPP is to be updated by a contractor. Title III Funds Secure Schools Act of 2000.	$15,000	Need to update county wildlife protection plan.	
Taos	R	Program	Plan Update	Taos County neighborhood zone overlays.	Taos County, Nathan Sanchez, Chief Planner	Planning will be preparing regulation in individual neighborhoods; there are 11 neighborhoods participating, and their overlays will become part of the Land Use regulation.	Taos County Planning Department	Taos County Neighborhoods	1 to 2 years - 2017/2018		Utilizing Taos County General Fund. Funding request 2015/2017		
Taos	R	Program	Plan Update	Taos County Land Use regulations update	Taos County, Nathan Sanchez, Chief Planner	The process will not commence until all changes in Land Use regulations have been completed	Taos County Planning Department	Taos County Neighborhoods	1-2 year project		Utilizing Taos County General Fund. General fund 2015/2016		
Taos	SS	Project	Water System Infrastructure	Upgrade Wastewater Treatment Plant	ICIP 2016-2020	Upgrade Wastewater Treatment Plant	Taos Ski Valley		2016		$275,000		
Taos	SS	Project	Water System Infrastructure	USFS Town site Act Land Acquisition	ICIP 2016-2020	USFS Town site Act Land Acquisition	Taos Ski Valley		2018		$250,000		
Taos	SS	Project	Water System Infrastructure	Design and Construct Wastewater Treatment Plant	ICIP 2016-2020	Design and Construct Wastewater Treatment Plant	Taos Ski Valley		2019-2020		$4,470,000		
Taos	SS	Project	Water System Infrastructure	Wastewater Collection Line Extension	ICIP 2016-2020	Wastewater Collection Line Extension	Taos Ski Valley		2020		$250,000		

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Taos	SS	Project	Water System Infrastructure	Taos Ski Valley Wastewater Treatment Plant	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct phase 1 of a wastewater treatment plant expansion and upgrade in Taos Ski Valley	Taos Ski Valley Wastewater Treatment Plant				$732,000		
Taos	R	Program	Plan Update	Repository to compile and publish data from Taos Valley	Taos County, Nathan Sanchez, Chief Planner	Proposal to compile and publish Hydrology data from the Taos Valley.	Taos Soil and Water Conservation District	Taos County, Town of Taos, Questa Village, Red River, Village of Taos ski valley	1-2 year project - 2017/2018	Partnerships	80,000		
Taos	SS	Project	Report	Taos Valley Abeyta Deep Wells Report	Taos Soil and Water Conservation District, A.L. Benson, Board Member	Compilation of data and conclusions from 18 wells drilled in conjunction with Abeyta Settlement	Taos Soil and Water Conservation District	Taos County, Town of Taos, Taos Pueblo, NM Bur Geology	2016	Need RFP	80,000		
Taos	SS	Project	Groundwater Analysis	County-wide monitoring of groundwater levels network	Taos Soil and Water Conservation District, A.L. Benson, Board Member	Sunshine Valley since 1955, Taos Valley since 2013	Taos Soil and Water Conservation District	Taos High school	Ongoing				
Taos	SS	Project	Groundwater Analysis	Water Quality Data or Investigation - S. Taos Valley water chemistry, Ojo Caliente uranium, Seco-Hondo uranium, Acequia water chemistry, Radon/alpha-beta particles, groundwater recharge	Taos Soil and Water Conservation District, A.L. Benson, Board Member	S. Taos Valley water chemistry, Ojo Caliente uranium, Seco-Hondo uranium, Acequia water chemistry, Radon/alpha-beta particles, groundwater recharge areas	Taos Soil and Water Conservation District		2012-2014-, 2020, 2025	Published in NMGS Spring Meeting			
Taos	SS	Project	Groundwater Analysis	Sunshine Valley groundwater levels and recharge quality	Taos Soil and Water Conservation District, A.L. Benson, Board Member	Sunshine Valley groundwater levels and recharge quality - precipitation, ET, storage, Cl mass balance	Taos Soil and Water Conservation District	NM Tech., NM Bureau of Geology	2015, 2016	Published in NMGS Spring Meeting			
Taos	SS	Project	Acequia Infrastructure	Talpa Irrigation Reservoir spillway Construct	Acequia Projects from Carlos Miera, 4/16	Construct and equip the Talpa irrigation reservoir spillway that supplies the Talpa, Acequia Madre and the Acequia del Monte del Rio Chiquito.	Taos SWCD			Request for funding	$150,000		Taos Planning Region FY 2015
Taos	SS	Project	Acequia Infrastructure	Des Montes Ditch Association	Acequia Projects from Carlos Miera, 4/16	Plan, design, and construct improvements to the Cuchilla ditch	Taos SWCD			Request for funding	$50,000		Taos Planning Region FY 2015
Taos	SS	Project	Acequia Infrastructure	Acequia Del Canon Improve	Acequia Projects from Carlos Miera, 4/16	To plan, design, and construct improvements, including a divider, on the acequia del Canon for the Acequias de Chamisal y Ojito	Taos SWCD			Request for funding	$50,000		Taos Planning Region FY 2015
Taos	SS	Project	Acequia Infrastructure	Acequia Del Monte Del Rio Chiquito Improve	Acequia Projects from Carlos Miera, 4/16	To plan, design, and construct improvements, including head gates. Talpa	Taos SWCD			Request for funding	$50,000		Taos Planning Region FY 2015
Taos	SS	Project	Acequia Infrastructure	Acequia Madre del Rio Grande Del Rancho Improve	Acequia Projects from Carlos Miera, 4/16	To plan, design, and construct Acequia and dam improvements, including head gates, for the Acequia Madre del Rio Grande del Rancho, del Finado Francisco Martinesz and the Acequia del Medio	Taos SWCD			Request for funding	$348,000		Taos Planning Region FY 2015
Taos	SS	Project	Acequia Infrastructure	Acequia del Llano San Juan de Nepomuceno improve	Acequia Projects from Carlos Miera, 4/16	To plan, design, and construct improvements on the Acequia de San Juan de Nepomoceno and the Acequia del Monte.	Taos SWCD			Request for funding	$60,000		Taos Planning Region FY 2015
Taos	SS	Project	Acequia Infrastructure	Acequia de Penasco Del Camino (Penasco): Diversion Dam	Acequia Projects from Carlos Miera, 4/16	Acequia de Penasco Del Camino (Penasco): Diversion Dam	Taos SWCD				$62,763		Taos SWCD active group project file

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Taos	SS	Project	Acequia Infrastructure	Acequita de Penasco (Penasco): Diversion Dam	Acequia Projects from Carlos Miera, 4/16	Acequita de Penasco (Penasco): Diversion Dam	Taos SWCD				$86,738		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Hart Ditch (Ranchos de Taos): Diversion Dam	Acequia Projects from Carlos Miera, 4/16	Hart Ditch (Ranchos de Taos): Diversion Dam	Taos SWCD				$65,113		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Acequia Cerro de Guadalupe (Cerro): Grade control Drop Structures	Acequia Projects from Carlos Miera, 4/16	Acequia Cerro de Guadalupe (Cerro): Grade control Drop Structures	Taos SWCD				$20,000		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Citizens Ditch (Questa) Diversion Dam	Acequia Projects from Carlos Miera, 4/16	Citizens Ditch (Questa) Diversion Dam	Taos SWCD				$128,828		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Randall Reservoir Ditch Assn. (Canon): Reservoir outlet works	Acequia Projects from Carlos Miera, 4/16	Randall Reservoir Ditch Assn. (Canon): Reservoir outlet works	Taos SWCD				$326,478		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Acequia Jose Venito Martinez (Taos): Diversion Dam	Acequia Projects from Carlos Miera, 4/16	Acequia Jose Venito Martinez (Taos): Diversion Dam	Taos SWCD				$138,000		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Acequia Madre del Pueblo (Taos): Flume	Acequia Projects from Carlos Miera, 4/16	Acequia Madre del Pueblo (Taos): Flume	Taos SWCD				$85,098		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Acequias del Chamisal y Ojito (Chamisal): Grade control drop structures	Acequia Projects from Carlos Miera, 4/16	Acequias del Chamisal y Ojito (Chamisal): Grade control drop structures	Taos SWCD				$17,000		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Acequia en Medio de los Rios (Talpa): Diversion Dam	Acequia Projects from Carlos Miera, 4/16	Acequia en Medio de los Rios (Talpa): Diversion Dam	Taos SWCD				TBD		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Acequia del Llano (Arroyo Hondo): Flume	Acequia Projects from Carlos Miera, 4/16	Acequia del Llano (Arroyo Hondo): Flume	Taos SWCD				TBD		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Ballejos Martinez Ditch (Amalia): Diversion Dam	Acequia Projects from Carlos Miera, 4/16	Ballejos Martinez Ditch (Amalia): Diversion Dam	Taos SWCD				TBD		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Acequia El Prado del Medio (El Prado): Diversion Dam	Acequia Projects from Carlos Miera, 4/16	Acequia El Prado del Medio (El Prado): Diversion Dam	Taos SWCD				TBD		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Acequia del Finado Francisco Martinez (Ranchos de Taos): Ditch lining	Acequia Projects from Carlos Miera, 4/16	Acequia del Finado Francisco Martinez (Ranchos de Taos): Ditch lining	Taos SWCD				TBD		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Acequia Penasco Sur (Penasco): Diversion Dam	Acequia Projects from Carlos Miera, 4/16	Acequia Penasco Sur (Penasco): Diversion Dam	Taos SWCD				TBD		Taos SWCD active group project file
Taos	SS	Project	Acequia Infrastructure	Cabresto Lake Irrigation District: Cabresto Dam repairs	Acequia Projects from Carlos Miera, 4/16	Cabresto Lake Irrigation District: Cabresto Dam repairs	Taos SWCD				$5,500,000		Other projects not on legislative list or Taos Water and Soil at this time
Taos	SS	Project	Acequia Infrastructure	Town of Taos: Acequia Revitalization Project	Acequia Projects from Carlos Miera, 4/16	Town of Taos: Acequia Revitalization Project	Taos SWCD				$1,020,000		Other projects not on legislative list or Taos Water and Soil at this time
Taos	SS	Project	Acequia Infrastructure	Cuchilla Ditch (Des Montes): Diversion Dam Repair and Ditch Lining	Acequia Projects from Carlos Miera, 4/16	Cuchilla Ditch (Des Montes): Diversion Dam Repair and Ditch Lining	Taos SWCD				$280,000		Other projects not on legislative list or Taos Water and Soil at this time

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Water Planning Region: Taos

County	Regional (R) or System-Specific (SS)	Strategy Type (Project, Program, or Policy)	Category	Project Name	Source of Project Information	Description	Project Lead (Entity or Organization)	Partners (Other Entities or Participants)	Timeframe (Fiscal Year)	Planning Phase	Cost	Need or Reason for the Project, Program, or Policy	Comments
Taos	R	Program	Watershed Restoration	Watershed Restoration	The Nature Conservancy, Laura McCarthy (and Ernie Atencio as of 5/11/2015), Director of Conservation Programs,	The Rio Grande Water Fund is an innovative program that will invest in wildfire mitigation treatments and stream restoration in forested headwaters of the Rio Grande, including the Sangre de Cristo Mountains along the western slope in Taos County, in order to protect critical water supplies for communities and downstream water users, and to improve watershed resilience given increasing intensity and severity of wildfires and climate change. The program goals are to generate sustainable funding over the next 20 years to proactively increase the pace and scale of forest restoration, prioritizing the most high-risk areas in the Rio Grande watershed. Leveraging current state and federal Hazardous Fuels Reduction expenditures, the program goal is to generate approximately $15 million to treat up to 30,000 acres per year - a tenfold increase over the current pace of forest treatment in the program area. Strategic landscape-scale investments will also spur local economic growth, create jobs, and revitalize New Mexico's forest industry.	The Nature Conservancy Rio Grande Water Fund	30 signatory organizations and more expected before the Regional Water Plan is completed: NM Land Grant Council; NM Land Grant Consejo; Chama Peak Land Alliance, Forest Guild, NMED, Ciudad Soil and Water Conservation District; NM Water Business Task Force; AMAFCA; Bernalillo County; NM Acequia Association; Trout Unlimited; USFWS; Valles Caldera National Preserve; NM Forest Industry Association; BLM; Sierra Club; Bosque Environmental Management Program; The Nature Conservancy; Natural Resources Conservation Service; Rocky Mountain Youth Corps; ABCWUA; Coronado Soil and Water Conservation District; NM Museum of Science and Natural History; Edgewood Soil and Water Conservation District; Claunch-Pinto Soil and Water Conservation District; NM Forest and Watershed Restoration Institute; Dekker/Peritch/Sabatini; LOR Foundation; Taos County; USACE	The Taos Valley Watershed Coalition proposal was for 2 years of planning and implementation. The planning is on Carson NF and Taos Pueblo lands. These agencies will implement on their own, in close coordination. The treatments are on private lands (El Salto Watershed Association) and will be implemented in coordination with NM State Forestry and Taos Soil and Water Conservation District. The Wind Mountain proposal could be implemented in 2 years with the Forest Guild as the lead organization working with BLM and SLO personnel. Funding request: needs discussion first.	The Rio Grande Water Fund has completed a Comprehensive Plan to serve as a road map, with participation from the signatory organizations and partners from about 40 different agencies and organizations. The Water Fund Comprehensive Plan can be downloaded at http://www.nmconservation.org/RGWF?RGWF_CompPlan.pdf The Water Fund issued a "Request for Statements of Intent" in January 2015 and had 2 responses from the Taos area. One was a 280,000-acre watershed planning project on behalf of the Taos Ski Valley and additional partners. The second was a proposal for Wind Mountain watershed with restoration of BLM and State Land Office properties. These might be projects to reference in the Regional Water Plan, and we can provide the proposals if desired.	See "comments" column. Taos Valley Watershed Coalition request was $1.1 million and Wind Mountain project $345,000.		Following are specific projects under development by the Taos Valley Watershed Coalition: The Kiowa-San Cristobal WUI Project is a 12,108 acre analysis area just north of the Rio Hondo. Proposed actions that reduce the chance of severe fire, including mechanical and prescribed fire, will begin once NEPA is complete in 2016. This treatment offers a line of defense for San Cristobal, Gallina Canyon, and makes both communities eligible for NFL Grants. ($187,500 spent on NEPA analysis to date.)The Twining Ridge and Corridor Fuel Break links a 112 acre parcel above El Salto with planned and existing fuel breaks to the south, with the natural fire break at the mouth of Hondo Canyon in Valdez, and with a proposed treatment extending northeast on Highway 150 to Taos Ski Valley (TSV) and into the Ski Permit Area just east of the TSV Village. This implementation will protect the watershed of the Wheeler Peak Wilderness, the Rio Hondo watershed, and TSV. A treatment here will make the El Salto Community eligible for NFL
Taos	R	Program	Watershed Restoration	Watershed Restoration	The Nature Conservancy, Laura McCarthy, Director of Conservation Programs,	The Rio Grande Water Fund (RGWF) is an innovative program that will invest in wildfire mitigation treatments and stream restoration in forested headwaters of the Rio Grande, including the Sangre de Cristo Mountains along the western slope in Taos County, in order to protect critical water supplies for communities and downstream water users, and to improve watershed resilience given increasing intensity and severity of wildfires and climate change. The program goals are to generate sustainable funding over the next 20 years to proactively increase the pace and scale of forest restoration, prioritizing the most high-risk areas in the Rio Grande watershed. Leveraging current state and federal Hazardous Fuels Reduction expenditures, the program goal is to generate approximately $15 million to treat up to 30,000 acres per year - a tenfold increase over the current pace of forest treatment in the program area. Strategic landscape-scale investments will also spur local economic growth, create jobs, and revitalize New Mexico's forest industry.	The Nature Conservancy Rio Grande Water Fund	Over 40 signatory organizations and more expected before the Regional Water Plan is completed: ABCWUA, AMAFCA, Bernalillo County, Bosque Environmental Management Program, Bohannan Huston, BLM, Chama Peak Land Alliance, City of Santa Fe, Ciudad Soil and Water Conservation District, Claunch-Pinto Soil and Water Conservation District, Coronado SWCD, Dekker/Perich/Sabatini, Edgewood SWCD, Forest Guild, LOR Foundation, Los Alamos County, MRGCD, NRCS, The Nature Conservancy in New Mexico, NM Acequia Association, NM Association of Conservation Districts, NM Business Water Task Force, NMDGF, NMED, NM Forest and Watershed Restoration Institute, NM Forest Industry Association, NM ISC, NM Land Grant Consejo, NM Land Grant Council, NM Museum of Science and Natural History, NM Watershed and Dam Owners Coalition, Rocky Mountain Youth Corps, Sierra Club, Taos County, Taos County Economic Development Corporation, Town of Taos, Taos Land Trust, Trout Unlimited, UNM, USACE, USFWS, USFS, Valles Caldera National Preserve, Village of Taos Ski Valley	The Taos Valley Watershed Coalition (TVWC) proposal was funded for one year of planning and implementation on Carson NF, Taos Pueblo lands, and El Salto Association lands (El Salto in partnership with TSWCD and under Taos County fiscal sponsorship). These entities will implement independently with some cross-boundary coordination.	The RGWF has completed a Comprehensive Plan (http://www.nmconservation.org/RGWF?RGWF_CompPlan.pdf) to serve as a general road map for the region. The TVWC has completed a comprehensive Landscape Restoration Strategy (http://allaboutwatersheds.org/library/inbox/tvwc-landscape-restoration-strategy/view) for 280,000 acres in the watersheds east of Taos, with specific prioritized project areas.	The TVWC received $225,000 from the RGWF in 2015 with another $385,000 available for 2016, with other matching and leveraged funding and in-kind contributions. Total long-term costs will be into the millions.		Specific projects as prioritized in the TVWC Landscape Restoration Strategy include Phase I: Pueblo Ridge NEPA planning for thinning treatments on 10,126 acres of Carson NF in the Rio Fernando watershed and a Comprehensive Forest Inventory on 10,325 acres of adjacent Pueblo land in the Rio Pueblo watershed; El Salto restoration thinning and hazardous fuel removal on 250 acres. Phase II: Rio Hondo corridor and Taos Ski Valley wildfire prevention through aspen treatments and TSV glading; two more tracts totaling 520 acres of El Salto thinning; McGafee Ridge prescribed fire treatment. Other projects under development in the TVWC area include the 12,108 Kiowa-San Cristobal WUI Project just north of the Rio Hondo and ongoing planning in the San Cristobal area.
Taos	SS	Project	Water System Infrastructure	Red River water system meters & improvements	Capital Outlay Database	Red River water sys meters & improve	Town of Red River				$150,000		Fund: STB

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Taos	SS	Project	Water System Infrastructure	Wastewater Plant and System Improvements	ICIP 2016-2020	Wastewater Plant and System Improvements	Town of Red River		2016-2017		$11,071,000		
Taos	SS	Project	Water System Infrastructure	Sewage Collection System Improvements	ICIP 2016-2020	Sewage Collection System Improvements	Town of Red River		2016-2017		$200,000		
Taos	SS	Project	Water System Infrastructure	Waterline Replacement	ICIP 2016-2020	Waterline Replacement	Town of Red River		2017-2018		$900,000		
Taos	SS	Project	Water System Infrastructure	Storm Drains	ICIP 2016-2020	Storm/Surface Water Control	Town of Red River		2017-2018		$435,000		
Taos	SS	Project	Water System Infrastructure	Pressure Zone Stations	ICIP 2016-2020	Pressure Zone Stations	Town of Red River		2020		$203,000		
Taos	SS	Project	Water System Infrastructure	Wastewater Plant and System Improvements	ICIP 2017-2021	Wastewater Plant and System Improvements	Town of Red River		2017-2018		$11,596,000	The potential for failure of aging equipment could affect the public health and safety by contaminating the receiving stream of untreated pollutants	
Taos	SS	Project	Water Conservation/ Water System Infrastructure	Water Meter Replacement	ICIP 2017-2021	Water Meter Replacement	Town of Red River		2017		$325,000	Reducing unaccounted for water can help identify leaks and promote water conservation	
Taos	SS	Project	Water System Infrastructure	Construct Water Tank	ICIP 2017-2021	Construct Water Tank	Town of Red River		2017-2018		$1,980,000		
Taos	SS	Project	Watershed Restoration	Bank Stabilization and Habitat Enhancement, a Red River Restoration Project	NMED		Town of Red River		6/30/2016		$288,234		State Project #: 14-G
Taos	SS	Project	Watershed Restoration	Red River Town Park Restoration Project (RSP)	NMED		Town of Red River		6/30/2018		$338,767		State Project #: 15-K
Taos	SS	Project	Water System Infrastructure/ Water Conservation	Water Meter Replacement	Town of Red River, Russell Church, Environmental Compliance Director	Plan, design, construct, purchase equipment, and install water meters. Replace residential and commercial water meters that are failing or not properly sized for the business. Replace handheld reading equipment with radio-read equipment. A water system with high unaccounted-for water loss may have leaks in the system or meters that are not registering properly. Without accurate meters, the degree of these problems can't be truly known.	Town of Red River		8-12 months; 2016. Funding request: FY2015 Capital Outlay Funds, FY 2016 CDBG - $293,000	The project is planned within the Public Work Department. Our PER will address the issues and our most recent conservation plan will address the water loss the town is experiencing.	$293,000		
Taos	SS	Project	Water System Infrastructure/ Water Conservation	Wastewater plant and system improvements	Town of Red River, Russell Church, Environmental Compliance Director		Town of Red River	U.S. Forest Service	3-5 months, depending on availability of parts. Strategy- Town of Red River and Dennis Engineering Company. 2015. Funding Request: Capital Outlay Funds - $4,000,000 (phase 1, replacement of RBC's, and secondary equipment).	A Preliminary Engineering Report was completed in July 2014.	$11,071,000		
Taos	SS	Project	Water System Infrastructure/ Water Conservation	Waterline Replacement	Town of Red River, Russell Church, Environmental Compliance Director	Design and construct aging waterlines. Replace water lines that are undersized and leaking. The replacement will help reduce the amount of water loss. The town's water system is in need of replacement in areas that have poor soil conditions that contribute to the deterioration of waterlines.	Town of Red River	U.S. Forest Service	6-8 months. Strategy- Town of Red River. 2016. Funding request: FY2017 Capital Outlay Funds, CDBG, Water Trust Board - $900,000	The project is planned within the Public Work Department. Our PER will address the issues and our most recent conservation plan will address the water loss the town is experiencing.	$900,000		

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Taos	SS	Project	Water System Infrastructure	Construct Water Tank	Town of Red River, Russell Church, Environmental Compliance Director	The project includes design, construction mtg., and construction of a new welded steel water tank and the rehabilitation of an existing 1.25 MG Tank. The new tank will be connected to the water system through a new distribution line along Bitter Creek Road sized in accordance with AWWA Guidelines. This project is necessary in order for the Town to provide adequate potable water and fire suppression capabilities to the residents of Red River.	Town of Red River	U.S. Forest Service	19 months for completion with 4 months off in the winter because of freezing temperatures. Strategy- Town of Red River, Dennis Engineering Company- Strategy complete. 2016 Funding request: FY2015 Water Trust Board, FY2016 Capital Outlay Funds - $1,900,000	A Preliminary Engineering Report is due for completion fall of 2015.	$1,900,000	This project is necessary in order for the Town to provide adequate potable water and fire suppression capabilities to the residents of Red River.	
Taos	SS	Project	Water System Infrastructure	Replace Fire Hydrants	Town of Red River, Russell Church, Environmental Compliance Director	The project includes planning, designing, replacing, and constructing new fire hydrants. The town will replace failing and lead gasket fire hydrants with new fire hydrants in accordance with AWWA Guidelines. This project is necessary in order for the town to provide adequate fire suppression capabilities to the residents of Red River.	Town of Red River		12 months for completion with 4 months off in the winter because of freezing temperatures. Strategy- Town of Red Ricer, Dennis Engineering Company- Strategy complete FY16. Funding request: FY2016 Capital Outlay Funds, CDBG - $300,000	A Preliminary Engineering Report is due for completion fall of 2015.	$300,000 ($5,000 per fire hydrant)	This project is necessary in order for the town to provide adequate fire suppression capabilities to the residents of Red River.	
Taos	SS	Project	Water System Infrastructure	Waterline Extension	Town of Red River, Russell Church, Environmental Compliance Director	Plan, design, construct, waterlines. Extend waterline on the east side of town near the Golden Nugget Condos. Currently this condominium unit is supplied by a 2-inch waterline and the nearest fire hydrant is a half mile away. This doesn't provide adequate water pressure or fire protection for this area. We are proposing to add 800 feet of 8-inch waterline and possibly 2 fire hydrants.	Town of Red River		2 months. Strategy- Town of Red River and Dennis Engineering Company. 2017. Funding request: FY2015 Capital Outlay Funds, FY 2016 CDBG - $42,000	The project is planned within the Public Work Department and the Red River Fire Department. Our engineer will be finishing a PER fall 2015.	$42,000	Currently this condominium unit is supplied by a 2-inch waterline and the nearest fire hydrant is a half mile away. This doesn't provide adequate water pressure or fire protection for this area. We are proposing to add 800 feet of 8-inch waterline and possibly 2 fire hydrants.	
Taos	SS	Project	Water System Infrastructure	New Water Tank & Rehabilitation Tank	Water Trust Board Database	New water tank & rehabilitation tank.	Town of Red River		FY2015		$1,583,333		
Taos	SS	Project	Water System Infrastructure	Weimer Area Sewer System	ICIP 2016-2020	Weimer Area Sewer System	Town of Taos		2016-2018		$700,000		
Taos	SS	Project	Water System Infrastructure	Camino del Medio Waterline	ICIP 2016-2020	Camino del Medio Waterline	Town of Taos		2017-2018		$1,260,000		
Taos	SS	Project	Water System Infrastructure	Airport Water System	ICIP 2016-2020	Airport Water System	Town of Taos		2020		$2,000,000		
Taos	SS	Project	Water System Infrastructure	Water System Improvements Phase 2	ICIP 2017-2021	Water System Improvements Phase 2	Town of Taos		2017		$4,983,903	The project will provide backup support to mutual domestics	
Taos	SS	Project	Water System Infrastructure	Water System Improvements Project	Water Trust Board 2016	Construction	Town of Taos				$1,764,518		
Taos	SS	Project	Water System Infrastructure	Storage, treatment, metering improvements	Water Trust Board Database	Storage, treatment, metering improvements.	Town of Taos		FY2015		$2,287,776		
Taos	SS	Project	Water System Infrastructure	Acequia Revitalization of Town of Taos	Town of Taos, Dan Barrone, Mayor	Address urban area acequia degradation. Goal 1:Reconnaissance of Town acequia in collaboration with TSWCD to determine need. Goal 2: Need will determine construction/mitigation/remediation effort.	Town of Taos - Dan Barrone, Fritz Hahn, Rick Bellis	Peter Vigil of TSWCD	This is a 5 year project: 2016/2017	Under development	Reconnaissance phase: $20,000 Estimated infrastructure: >$1,000,000		
Taos	SS	Project	Water System Infrastructure	Trampas DWC & MSWA Water Sys Improve	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct water system improvements for Trampas domestic water consumers and mutual sewage works association	Trampas DWC & MSWA Water Sys Improve				$40,000		

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Taos	SS	Project	Water System Infrastructure	Trampas MDWCA new well or installation of filter system	Trampas MDWCA, Alex J Lopez, President	Trampas drinking water system has had problems with elevated levels of alpha and total uranium. An EID report and a PER report are in progress. Might have to drill a new well or install a treatment system.	Trampas MDWCA	NM Drinking Water Bureau, NM Construction Bureau	2017-2020	EID - Environmental Impact Development Report PER - Preliminary Engineering Report Souder Miller & Associates	Unknown - to be determined pending results of reports	Elevated levels of alpha and total uranium in water supply	
Taos	SS	Project	Water System Infrastructure	Supplemental water supply well and new distribution water lines	Mutual Domestic Subcommittee, Ramon Lucero	*Last 10-Years Project:* New water storage tank, water meters, new waterlines, rehabilitate water storage tank, and new billing system *Proposed 10-Year Projects:* Supplemental water supply well and new distribution water lines	Tres Piedras MDWCA						
Taos	SS	Project	Water System Infrastructure	New Well	Water Trust Board Database	New well.	Tres Piedras MDWCA		FY2015		$420,000		
Taos	SS	Project	Watershed Restoration	Rio Costillo Watershed Restoration	Trout Unlimited, Toner Mitchell, Public Lands Coordinator	Repair damaged wetlands in high-elevation Comanche Creek to increase yield of cold water to Rio Costilla drainage, serving Amalia, Costilla, and Colorado. Other benefits include forest health, range health, cattle growers, fishing and tourism. Data collection will be an additional aspect; we will need to quantify riparian water table response to restoration work. Rio Grande cutthroat trout will benefit, delaying or avoiding ESA listing of this fish, and land use consequences.	Trout Unlimited	Quivira Coalition, USFS, National Forest Foundation, Corporate Funding, other foundations	Implementation to begin FY2016 (CY2015). Funding request: $120,000 FY2016.	Concept design, wetland inventory - sites selected for restoration. NEPA complete, less archaeology. Awaiting ACOE 404 permit.	$155,000/year, 4 years.	Benefits include forest health, range health, cattle growers, fishing and tourism. Rio Grande cutthroat trout will benefit, delaying or avoiding ESA listing of this fish, and land use consequences.	
Taos	SS	Project	Habitat restoration	Rio Hondo Tributaries Invasive Fish Barrier	Trout Unlimited, Toner Mitchell, Public Lands Coordinator	Rio Hondo tributaries invasive fish barriers - On Yerba and Italimos creeks, to prevent upstream migration of Brown and Rainbow Trout to detriment of native Rio Grande Cutthroat Trout. Establishing summer tourism depends on isolating Cutthroats. Vulnerable Cutthroats will delay economic development in Taos and Taos Ski Valley for summer recreation	Trout Unlimited	Taos Ski Valley, Village of Taos Ski Valley	FY2016 Private Funder and/or Taos Ski Valley	Preliminary Design for culvert inserts. NEPA may be unnecessary.	2 culverts -- $25,000.00 each		
Taos	SS	Project	Water System Infrastructure	Union del Llano Water Tank Replacement	Union del Llano MDWCD, Tanya Leherissey, President	Union del Llano is a regionalized system of 2 parallel water systems in Llano, New Mexico. Line replacement is our most imperative problem. We must have a comprehensive design for storage tank/s, lines, meters and comingling the wells. A 40 year plan and O+M plan are on the horizon.	Union Del Llano MDWCA		ICIP 2016; Hopefully complete by 2019	PER is complete + surveys of easements by NMFA planning grant. Planning and design is next. No construction thus far.	The entire project at about $1,000,000. New (wells with meters, a new 70,000 gallon tank or dual tanks of that volume. This project is currently under review by WTB.		
Taos	SS	Project	Water System Infrastructure	Water System Improvements	Water Trust Board Database	Water system improvements.	Union del Llano MDWCA		FY2015		$197,084		
Taos	SS	Project	Water System Infrastructure	Union Del Llano MDWCA Water Sys Improve	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct water system improvements for the Union del Llano mutual domestic water consumers association in Llano	Union Del Llano MDWCA Water Sys Improve				$231,000		
Taos	SS	Project	Water System Infrastructure	Uranium treatment facility, well house, booster tank, new water storage tank, fire hydrants, water meters and 6-in waterlines	Mutual Domestic Subcommittee, Ramon Lucero	*Last 10-Years Project:* New water storage tank *Proposed 10-Year Projects:* Uranium treatment facility, well house, booster tank, new water storage tank, fire hydrants, water meters and 6-inch waterlines	Upper Arroyo Hondo MDWCA		This is a proposed 10-yr project.				
Taos	SS	Project	Water System Infrastructure	Upper Arroyo Hondo MDWCA Loan Repay	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To pay off a rural infrastructure loan used for water system uranium mitigation for the Upper Arroyo Hondo mutual domestic water consumers association	Upper Arroyo Hondo MDWCA Loan Repay				$95,000		
Taos	SS	Project	Water System Infrastructure	Upper Arroyo Hondo MDWCA Water System Improve	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To plan, design and construct water system improvements, including a tank, hydrants and pipe, for the Upper Arroyo Hondo mutual domestic water consumers association	Upper Arroyo Hondo MDWCA Water System Improve				$585,000		

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Taos	SS	Project	Acequia Infrastructure	Ute Creek Water Users Association Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Ute Creek Water Users Association	Ute Creek Water Users Association			Pre-Planning			
Taos	SS	Project	Water System Infrastructure	70,000-gallon Tank Replacement	Vadito Mutual Domestic Water Users Association, Charles Gonzales, Chairperson	We need a 70,000-gallon tank replacement. 2,000 ft of 6-inch line to tank and a new well house. Some parts of the line are already 20 years old, and within 10 years need replacement with 6-inch line for about 3,000 ft to accommodate fire suppression within the Village of Vadito. A 40-year plan would be useful.	Vadito MDWCA		2020. Funding request: unknown- ICIP request in 2015	No documents have been prepared though a design was completed 4-5 years ago by Souder and Miller.	$600,000	Some parts of the line are already 20 years old, and within 10 years need replacement with 6-inch line for about 3,000 ft to accommodate fire suppression within the village of Vadito	
Taos	SS	Project	Acequia Infrastructure	Vadito South side Ditch Improvements	Statewide Acequia Survey, NMAA	To plan, design, and construct improvements to Vadito South side Ditch (Main headgate)	Vadito South side Ditch			Pre-Planning		Main headgate	
Taos	SS	Project	Acequia Infrastructure	Vadito Southside Ditch Improvements	Statewide Acequia List (NMAA)	To plan, design, and construct improvements to Vadito Southside Ditch	Vadito Southside Ditch			Pre-Planning			
Taos	SS	Project	Water System Infrastructure	6-inch waterline, new water storage tank, new pump house, and water meters	Mutual Domestic Subcommittee, Ramon Lucero	*Last 10-Years Project:* Replace water supply pump, chlorination pump, repair waterlines and administration regionalization. *Proposed 10-Year Projects:* 6-inch waterline, new water storage tank, new pump house, and water meters	Valdez MDWCA						Last 10-yrs project: replace water supply pump, chlorination pump, repair waterlines and administration regionalization
Taos	SS	Project	Water Rights Purchase	Questa Water Rights Purchases	Capital Outlay Database	Questa Water Rights Purchases	Village of Questa				$150,000		Fund: STB
Taos	SS	Project	Water System Infrastructure	Construct New Water Storage Tank	ICIP 2016-2020	Construct New Water Storage Tank	Village of Questa		2019		$650,000		
Taos	SS	Project	Water System Infrastructure	Water Rights Purchase	ICIP 2017-2021	Water Rights Purchase	Village of Questa		2017-2021		$800,000	Need additional water rights to offset pumping required to meet demand	
Taos	SS	Project	Water System Infrastructure	Water System Improvements	ICIP 2017-2021	Water System Improvements	Village of Questa		2017, 2020-2021		$2,884,950	Inadequate water lines and insufficient storage capacity/ fire hydrant	
Taos	SS	Project	Water System Infrastructure	Sewer Line Extension	ICIP 2017-2021	Sewer Line Extension	Village of Questa		2017		$2,400,000	Provide access to Village residents with no current hookups	
Taos	SS	Project	Water System Infrastructure	New Water Well (Questa)	Village of Questa, Loretta Trujillo	New Water Well (Questa)	Village of Questa						
Taos	SS	Project	Water System Infrastructure	New Water Tank (Questa)	Village of Questa, Loretta Trujillo	New Water Tank (Questa)	Village of Questa						
Taos	SS	Project	Water System Infrastructure	Acquisition of Water Rights (Questa)	Village of Questa, Loretta Trujillo	Acquisition of Water Rights (Questa)	Village of Questa						
Taos	SS	Project	Water System Infrastructure	Water Distribution lines (Questa)	Village of Questa, Loretta Trujillo	Water Distribution lines (Questa)	Village of Questa						
Taos	SS	Project	Habitat restoration and acequia infrastructure	Questa Fish Habitat Improvement	Trout Unlimited, Toner Mitchell, Public Lands Coordinator	Install fish habitat structures for trout holding - rocks + logs. To improve tourism/subsistence fishing, serving economy, train local machine operators for stream work. Job growth a priority. Project(s) to take place in Village. Headgate and irrigation infrastructure included as benefits water conservation.	Village of Questa	Trout Unlimited, Questa funding board, Private Funders (?)	FY2016 to Questa Funding Board and Private Funder	Concept Designs	$200,000.00 per 1/4 mile of restored stream -- $3,000,000.00		
Taos	SS	Project	Water System Infrastructure	New Wastewater Treatment Plant	ICIP 2017-2021	New Wastewater Treatment Plant	Village of Taos Ski Valley		2017-2018		$5,500,000		
Taos	SS	Project	Water System Infrastructure	Kachina Water Tank	ICIP 2017-2021	Kachina Water Tank	Village of Taos Ski Valley		2017		$2,200,000	New water tank needed	
Taos	SS	Project	Water System Infrastructure	Block N Water and Sewer Line Extension	ICIP 2017-2021	Block N Water and Sewer Line Extension	Village of Taos Ski Valley		2017-2018		$1,325,000		
Taos	SS	Project	Water System Infrastructure	Kachina Water Tank	Water Trust Board Database	Kachina water tank.	Village of Taos Ski Valley		FY2015		$1,810,000		
Taos	SS	Project	Water System Infrastructure	Gunsite Spring Infiltration Gallery	Water Trust Board Database	Gunsite Spring Infiltration Gallery	Village of Taos Ski Valley		FY2015		$640,000		

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Taos	SS	Project	Water System Infrastructure	West Rim MDWCA Card Reader Meter System	Legislative Council Service, 52nd Legislature, 2nd Session, 2016	To purchase and install a replacement card reader meter system for the West Rim mutual domestic water users' association	West Rim MDWCA Card Reader Meter System				$30,000		

Appendix 8-B

Watershed Subcommittee Vision, Goals, and Policy Recommendations

Taos Regional Water Plan
Watershed Subcommittee
Vision, Goals and Policy Recommendations

I. Vision:

Healthy resilient watersheds that nourish Taos regional ecosystems and communities with a reliable supply of high quality water.

II. Goals:

In order to secure a clean reliable supply of water in the Taos region, projects, programs and policy initiatives that meet the following goals should be encouraged:

- Implement watershed restoration and management policies that improve and maintain water quality and supply.
- Protect and restore wetlands that provide water storage, regulate stream flow and improve drought resiliency.
- Improve watershed resiliency to catastrophic fire by restoring fire-adapted forests.
- Promote and implement Green Infrastructure projects (projects that mimic natural processes to infiltrate or reuse storm water) to improve the region's ability to respond to extreme events such as drought and flooding.
- Promote integrated mapping, planning, and projects that make the connection between watersheds and end users – headwater to crops and cups projects.
- Utilize existing policies, adopt new local policies and advocate for state and federal policies to achieve these vision and goals.

III. Policy Recommendations:

This section outlines recommendations regarding State and local policy that meet the Watershed Subcommittee's vision and goals, improves watershed health, and helps secure a clean future water supply for the region . It is the intent of the Watershed Subcommittee that all such recommendations remain consistent with the Public Welfare Statement of the Taos County Regional Water Plan, and preserve the important historic, cultural, and economic traditions of the region.

The policy recommendations include proposals that may require amendments to State statute or administrative code, municipality or county ordinance, or other regulatory policies. In addition to developing specific policy recommendations, the Subcommittee recommends that in each case, a strategy for education and outreach, including, wherever possible, an analysis of the economic and ecological benefits of such recommendations, be developed.

As an ongoing matter, recommendations will be refined, additional ones developed, and recommendations in similar regions and watershed management plans monitored and, based on such comparison and review, ordinance amendments and other changes in policy may be developed and forwarded to decision-makers and stakeholders in the Regional Water Plan framework.

A Forest Health and Water Source Protection Recommendations:

Background for Recommendations: Heathly forests and headwater sources are critical for sustained streamflow and groundwater recharge. Overgrown forest conditions create conditions where snow accumulation is reduced, the impermeability of the landscape is increased,, and risk of catastrophic wildfire goes up. The extent and costs of restoring headwater source areas are significant and require substantial coordination among all levels of government and stakeholders. By identifying or raising local matching funds the Taos Region could leverage federal and state funding opportunities to improve forest health and water source protection in the region.

1. Recommendation: Establish a dedicated local funding source for watershed restoration to leverage and match federal and state funding and to catalyze investment from downstream water users.

2. Recommendation: Advocate for state policies that require agencies to coordinate their investments with each other—and with federal, local, tribal, and private investment—in priority areas for watershed restoration using locally-developed, science-based landscape restoration plans as a guide.

3. Recommendation: Invest in protection against catastrophic wildfire with full implementation of components of the Taos County Community Wildfire Protection Plan that address watershed protection, updated 2015. (Revise with details when 2015 CWPP update is available)

4. Recommendation: Advocate for state and local policies that encourage and support on-the-ground implementation of ecologically based thinning to restore forest health and prevent catastrophic fire from spreading across large areas.

5. *Recommendation:* Advocate for local, state and federal policies that require implementation of erosion control and water infiltration strategies in conjunction with all hazardous fuel reduction projects.

B. Stream Buffer Recommendations

Background for Recommendation: Research indicates that buffers of 85 feet or greater are effective at reducing the amount of pollution that reaches waterways. Buffers of less than 32 feet are rarely effective at reducing pollution. [1]

[1] EPA studies reveal that 50-meter (165 feet) wide buffers reduce nitrogen pollution by about 85 percent; while 26 to 50 meter (85-165 feet) buffers reduce nitrogen by about 70 percent. Buffers 5 to 10 meters (16-32 feet) wide are much less effective, only occasionally reducing excess nitrogen runoff that reaches these flowing waterways. http://epa.gov/research/sciencematters/sept2012/riparian.htm

Current Regulatory Landscape: Taos County has stream buffer requirements for all new development near waterbodies. For new development of 2 acres or more there is a minimum setback from streams, wetlands or springs of 150 feet. For development of less than 2 acres the setback requirement from streams, wetlands or springs is 85 feet. For acequias there is a 50 foot setback requirement for commercial development of more than 2 acres and a 25 foot setback requirement for development of 2 acres or less. (Taos County Land Use Regulations at Section 4.3.1.J) The Town of Taos does not have setback requirements for new buildings. The Village of Taos Ski Valley has a 15 foot setback requirement (Village of Taos Ski Valley Ordinance 10-30) which they enforce as an average setback requirement, meaning that building footprints can come closer than 15 feet to a river as long as the average of the setback distance for the whole building comes to 15 feet. Given the diverse landscapes of the Taos region, a one-size-fits all approach is not always feasible and therefore variance options should be preserved, especially when cultural or historical impacts are demonstrated.

1. Recommendation: Address gaps in water protection throughout the planning area by adopting or strengthening stream buffer ordinances in those areas where either there currently aren't stream buffer setbacks, or current setbacks are less than 85 feet.

2. Recommendation: Develop other model ordinance provisions that incentivize dedication/ protection of stream buffers and other riparian corridors (For example, in subdivision ordinances).

C. Increasing Permeability and Water Storage Through Green Infrastructure, Low Impact Development, and Improved Rangeland Management Recommendations

Low Impact Development (LID) means an approach to land development or re-development and management that works with nature to manage storm water as close to its source as possible.

Green Infrastructure (GI) means a system that mimics natural processes in order to infiltrate, evaporate or reuse storm water. Green infrastructure uses soils, topography, and vegetation in a way that minimizes the impacts of anthropogenic disturbance and maintains predevelopment hydrology and water quality.

Background for Recommendations: Requiring development to mimic predevelopment hydrology through green infrastructure techniques has multiple benefits to the community. In practice green infrastructure means preserving, creating, or restoring vegetated areas and natural corridors such as green space, green roofs, parks, conservation easements, and riparian buffers. These green spaces not only protect water quality but also increase the livability of an area. Impervious surfaces such as roads, parking lots and buildings are significant contributors to water pollution. Impervious surfaces cause increased and more polluted storm water runoff to reach our rivers and streams and the level of imperviousness in a watershed has been shown to be directly

related the health of its rivers, streams and lakes [2] By mimicking predevelopment hydrology, impervious surfaces are minimized and storm water is captured, infiltration is encouraged, and pollution is controlled. Common engineered Green Infrastructure approaches include green roofs, rain gardens, rain barrels or cisterns, vegetated swales, pocket wetlands, and permeable pavement. Sometimes the runoff in a developed area can be greatly reduced by implementing simple solutions like making cuts in sidewalks to allow storm water to flow into vegetated areas.

In addition to improving the permeability and infiltration potential of our developed landscapes there is a need to improve the permeability of our agricultural and rangeland resources. Short-grass grazing and soil compaction have combined to establish a landscape level need for remediation. Our region historically had grass resources that were "belly-high to a horse" while now, due to "complete utilization", a practice that leads to desertification, our rangelands have been depleted. Restored rangeland stores more water, has increased hardiness in the face of drought, and produces more feed during adequate water cycles.

1. Recommendation: Encourage federal, state and local jurisdictions within the planning area to develop regulations based on the use of green infrastructure as an effective and feasible means of reducing stormwater pollution.

2. Recommendation: Encourage federal, state and local jurisdictions within the planning area to require that new development and redevelopment mimic natural hydrology through Low Impact Development and Green Infrastructure techniques.

3. Recommendation: Create a Taos Region Green Infrastructure Working Group to investigate what GI techniques are most appropriate for the region; the regional economic, cultural and ecological benefits of these techniques; and how these GI techniques can be encouraged and implemented in the region. Engage in public outreach and education activities to communicate the findings and recommendations of the Working Group to the public.

4. Recommendation: Develop incentives for implementing GI and LID techniques and other erosion control mechanisms.

5. *Recommendation:* Create educational opportunities and policies that encourage growing a "stand" before introducing livestock into pastures and leaving a post grazing residual stand of at least 30% and optimally 50%.

D. Wetland Protection Recommendations:

Background for Recommendation: Wetlands are the sponges of our watershed. They provide resiliency in times of both drought and floods. Wetlands store water and release water slowly over the year, instead of all at once during the spring runoff and thus

[2] Dana Beach, Costal Sprawl: The Effects of Urban Design on Aquatic Ecosystems in the United States, Pew Ocean Commission, 2002.

healthy wetlands are critical for maintaining stream flow. The New Mexico Environment Department is working with organizations and local governments to develop regional wetland action plans. There is potentially federal funding available to draft these plans.

1. Recommendation: Develop a Wetland Action Plan to identify wetlands on public and private lands in the planning region, identify priorities for protection and restoration, and establish a robust public outreach, education and private landowner engagement strategy.

2. Recommendation: Identify and encourage incentives for private land owners in the planning area to protect and restore wetlands on their property – some specific avenues to consider would be conservation easements, mitigation banking, and a preferential property tax mechanism.

E. Beneficial Use of Water Rights Recommendations

Background for Recommendations: Watershed health is directly related to streamflow. The prior appropriation doctrine that drives western water law requires water rights owners to put their water rights to beneficial use or risk forfeiture of those rights. Stream diversions could be planned more holistically based on the flow ecology of the watershed and based on criteria such as timing, water quality and temperature, in order to maintain streamflow without sacrificing agricultural productivity..In addition to the ecological benefits of consistent streamflow, there are significant economic and health benefits from nature tourism and outdoor recreation associated with healthy riparian systems.

1. Recommendation: Identify opportunities in Acequia culture and New Mexico water law and regulatory framework to promote mutually beneficial instream flow transactions.

2. Recommendation: Identify pilot transaction opportunities in order to demonstrate multiple benefits from creating conservation efficiencies and enabling environmental flow transactions.

Appendix 8-C

Public Welfare Statement

Current

TAOS REGIONAL WATER PLAN
PUBLIC WELFARE STATEMENT

Agua es Vida – Water is Life

Spanish Partidas, Law 3: "Las cosas que son de todos y todas – son l'agre, sol, uvia, agua y el mar."

"The things which belong in common to all the living creatures of the world are the air, rain, water, the sea, and its shores; for every living creature may use them according to his wants."

I. INTRODUCTION:

Water is the most fundamental natural resource sustaining the communities and environment of the Taos Region.

This Statement addresses the Public Welfare criterion in New Mexico water law that was codified in response to Judge Bratton's ruling in the *El Paso*[1] case, but that has not been adequately defined at the statewide level. The Constitution and laws of New Mexico establish a system of private property rights, following the principle of prior appropriation that governs water rights in New Mexico. In addition, the historically preceding Spanish and Mexican systems of water governance were guided by a principle of shared water management.

The Taos Region is an area of unparalleled natural beauty and cultural wealth. The integrity of our surface water and groundwater resources is inextricably interwoven with the continued health of our natural environment and the viability of our traditional communities.

The traditional cultures of our region have revered water as the lifeblood of their communities. Traditional communities established effective systems of community governance and management of water. These systems evolved to protect the long-term sustainability of local water resources and they reflect the centrality of those water resources in maintaining the social fabric of local communities. Water was and to some extent continues to be viewed as a resource that is meant to serve the people, the land, and the animals of our communities. Present day inhabitants of the Taos Region have inherited this ethic of respecting our local natural resource base and of cultivating truly sustainable communities.

Thus, the Region has a long history of managing water sustainably within the limits of the local supply, while providing good quality water for domestic, agricultural, municipal and industrial uses and preserving healthy watersheds conditions and wildlife habitat to a higher degree. This tradition of managing water in a manner that is harmonious with nature and designed to sustain the long-term viability of local communities represents a central element of the Region's heritage. This tradition stands alongside the more recent

[1] *City of El Paso v. Reynolds*, 563 F. Supp. 379 (D.N.M. 1983); *City of El Paso v. Reynolds*, 597 F. Supp. 694 (D.N.M. 1984).

legal practice of treating the right to use water beneficially. Today this backdrop of traditional wisdom offers valuable guidance for the governance of water resources in the Region and the State.
New Mexico water law affirms that water rights are appurtenant to land, which reflects the fact that in northern New Mexico water historically has been understood to be rooted in the land and communities within its area of origin.

In most years the majority of irrigation water rights in the Taos Region are not fully met (i.e., the water rights holders do not receive enough water to supply the number of irrigations within a season to which they have an adjudicated right). Within the Region it generally is agreed that the public welfare requires that existing water rights within the Region and within the sub regions defined in the Taos Regional Water Plan be fully met before water is transferred out of the Region. It is also agreed that all water rights of owners within the region be adjudicated before any transfers be allowed out of the region.

The Taos Region has expanded consistently since the decline during World War II. The local economy continues to show increases in various sectors and in the number of seasonal residents who choose to extend their residence throughout the year. So, the public welfare requires that all residents of the Region, including supposedly seasonal residents, be considered and provided for as water users.

The cultural wealth of our region includes water to supply the varied agricultural, recreational, and environmental uses of water in the Region, including large and small family farms and gardens, ranching operations, the ski industry, and the important fisheries and wildlife populations.

Notwithstanding the wisdom of historical water management in the Region, residents are concerned that growth pressures from outside and inside the Region could have created and could create problems in terms of diminished surface water flows, lowered water tables, and degraded water quality.

There is widespread concern that applications for such appropriations and changes in point of diversion, place of use or purpose of use are not adequately publicized under existing State Engineer procedures to make local inhabitants aware of those applications and the potential need to take action to protect local and regional interests.

To the extent that it is consistent with their authority, all governmental agencies and political subdivisions in the Region should seek to maximize the Public Welfare in water by adopting and enforcing land use, zoning, and other local measures that tend to prevent the creation of additional problems with surface, ground water resources and personal effects to land owners.

This Public Welfare statement is intended to be a living document that reflects the wishes of the public in the Taos Region. Further, it is intended to be reviewed and revised as changing circumstances warrant.

II. DEFINITION OF THE PUBLIC WELFARE

A. Scope:

The following criteria, which define the Public Welfare within the Taos Region, should be considered by the State Engineer in deciding whether to approve a water transfer application.

B. Individual Criteria:

1. Cultural Protection:

The residents of our multicultural communities have always had a deep cultural connection with the local waters around which their communities were first organized and in relation to which these communities have developed their distinctive social fabric.

Our cultural heritage is one of our greatest assets. The diversity and mutual enrichment of Native American, Hispanic, and other cultures have been nurtured over centuries and millennia by the Region's scarce water resources.

Our cultural wealth and diversity, especially our acequia-based communities, have made Taos a magnet for people from around the United States and the world. As such, they are an essential component of the Region's and State's economic and historic vitality. So, we recognize the importance of protecting and maintaining our water resources in terms of water quality and available water supply sufficient to support the local communities and enable them to grow over the long term.

2. Agrarian Character:

The traditional agrarian character of the Region's land and communities continues to be a vital part of the Taos Region's social and cultural fabric. Land based communities keep water connected to the land and within the local watershed. Subsistence and pastoral agriculture have provided local sustainability for many years. Small scale farming and ranching continue to be a vital part of the local economy, providing income and sustenance for many residents of the Region. Local agriculture provides a rural lifestyle, a food supply, and employment for people in our local communities.

Residents of the Region have a strong preference for maintaining the connection between land and water for agricultural uses. Acequias have existed in this area for hundreds of years; they are part of the historical environment, and contribute to its local sustainability. We believe that water rights within the Taos Region should be met in full and all rights adjudicated before water is considered to be transferred out of the Region.

3. Ecological Health: Vitality of Watersheds and Ecosystems
The natural environment, particularly the health of the watersheds is central to the physical, cultural, and spiritual health of local residents.

Our watersheds are our primary source of water. As such, they are the foundation of the diversity of living things and the quality of the environment. The residents of the Region find that protecting and enhancing the long-term health and sustainability of these watersheds and the ecosystems they support is essential to the Public Welfare.

In addition, the health of our watersheds and aquifers allows them to perform vital services that sustain the human communities as well as the flora and fauna of the Region. Among the ecological services performed by our healthy watersheds are flood, drought, and fire mitigation, and the provision of wildlife and fish habitat. Acequias are a vital part of the landscape and watersheds that contribute to the Region's ecological health.

4. Long-Term Economic Development Potential:
The Region has grown rapidly over the past few decades and clearly is on a path towards continued growth, in terms of both residential and commercial development. The protection and development of sustainable local water supplies through comprehensive water resource planning is essential to support long-term growth and economic development, including increased residential, commercial, municipal and industrial use.

5. Recreational Tourism:
The stunning beauty of the area has long played a major role in the history, culture, and spiritual well being of local residents, and in making the Region a destination for tourists. Tourism depends on adequate quantities and quality of water and is a major, growing component of our economy. Visitors from around the United States and the world flock to the Taos Region for such outdoor pursuits as skiing, snowshoeing, snowboarding, whitewater rafting, kayaking, fishing, birding, hiking, and hunting.

Our continued ability to attract and support these activities is vital to ensuring that we have an economically and socially healthy future, which is directly dependent on the protection of our local waters.

6. Public Information and Educational Outreach:
The viability of all communities in the Region depends on our limited, interconnected local waters which sustain us all.

The ability of local communities to gather, share and analyze geological, hydrological and water rights information on which they depend is critical to our' ability to use and protect those waters effectively. Thus, the gathering and dissemination of high

quality information about water resources would significantly enhance the Public Welfare.

To achieve that goal, local and state entities should work together in creating a water repository to obtain, share, and disseminate comprehensive, reproducible data of all water resources.

7. Conservation:
We recognize that water is a precious and limited resource, and realize that in a fully appropriated system water conservation and reuse may be one of the few alternative sources of supply.

It is imperative that we conserve the resource by implementing Best Management Practices (BMPs), to reduce water waste, and we acknowledge the importance of conservation when managing and administering water supplies.

An appropriation or change in point of diversion, place of use or purpose of use of water from or within the Taos Region should meet the following conservation criteria:

a. The applicant has developed a conservation plan that uses applicable BMPs and best practicable technology to minimize water use;
b. The applicant has committed to using the lowest quantity of water reasonably necessary for the proposed use;
c. The appropriator or applicant has shown that there is actual, reasonable demand for the proposed water use in the proposed area of use;
d. No reasonably available alternative to, or modification, or limitation of, the proposed use of water that would use less water can be identified.

8. Water Supply Management:
We acknowledge that water management depends on conservation while maintaining sustainable balance between recharge to aquifers and groundwater withdrawals. Therefore, a proposed appropriation or change in point of diversion, place of use or purpose of use, in combination with existing appropriations, should not exceed the sustainable rate of recharge of the groundwater basin from which the water is proposed to be appropriated or changed.

We recognize the importance of sustainable surface water supply management. Maintaining streams and watercourses is important to the region, as well as downstream users. Likewise, maintaining and restoring watersheds is important to sustaining community water supplies.

Because of the interconnection between streams and their underlying aquifers, the Taos Region supports comprehensive monitoring and managing of both surface and ground water to maintain the balance and sustainability of uses from both sources (conjunctive management).

To enhance its water supply management, the Region continues to support hydrologic studies, aquifer mapping, and a comprehensive system of monitoring and measurement.

A system or water agreement between watersheds, sub regions within the Region should be considered, discussed, and studied for the benefit of all of the Taos communities and residents.

9. Conjunctive Management:

In light of current levels of water use and growth trends in the Region and the rest of the State, our surface and groundwater resources should be managed conjunctively in order to prevent excessive diversions of surface water or groundwater from depleting related surface and groundwater resources. In the absence of conjunctive management, there is a significant risk that too many wells could be permitted, cumulatively lowering the water table, negatively affecting pre-existing wells and depleting surface flows in hydrologically connected stream systems. Such a pattern of water diversion would be to the detriment of the public welfare and conservation of water. Therefore, review of proposed water uses, including appropriations and changes in point of diversion, place of use or purpose of use should incorporate the principle of conjunctive management by taking into account the interconnections between groundwater and surface water resources in the Region and the potential for diversions from one type of water source to have impacts on the other.

10. Minimizing Water Contamination:

The contamination of surface and groundwater resources and drinking water supplies from a variety of sources, including the proliferation of septic systems and nearby domestic wells, is a matter of considerable concern in the Region. The better the water quality of all water resources, the greater the public welfare that will be derived from the Region's waters. Actions that would improve water quality are more likely to increase, than to diminish, the Public Welfare. By the same token, actions – including some appropriations and changes in point of diversion, place of use or purpose of use of water – that would degrade water quality will tend to diminish the Public Welfare.

To further the goal of minimizing water contamination, our communities should work to develop waste water disposal programs by regulation and through funding requests.

C. Consistency with the Public Welfare:

To be consistent with the Public Welfare, a proposed appropriation or change in point of diversion, place of use or purpose of use of water should be harmonious with the principles and criteria set forth in this Public Welfare Statement, and should not conflict with or undermine those principles and criteria.