Socorro Main Canal South Distribution Hub

WaterSMART: Drought Resiliency Project Grants for FY 2016

Funding Opportunity Announcement: R16-FOA-DO-006
4/8/2016

Applicant
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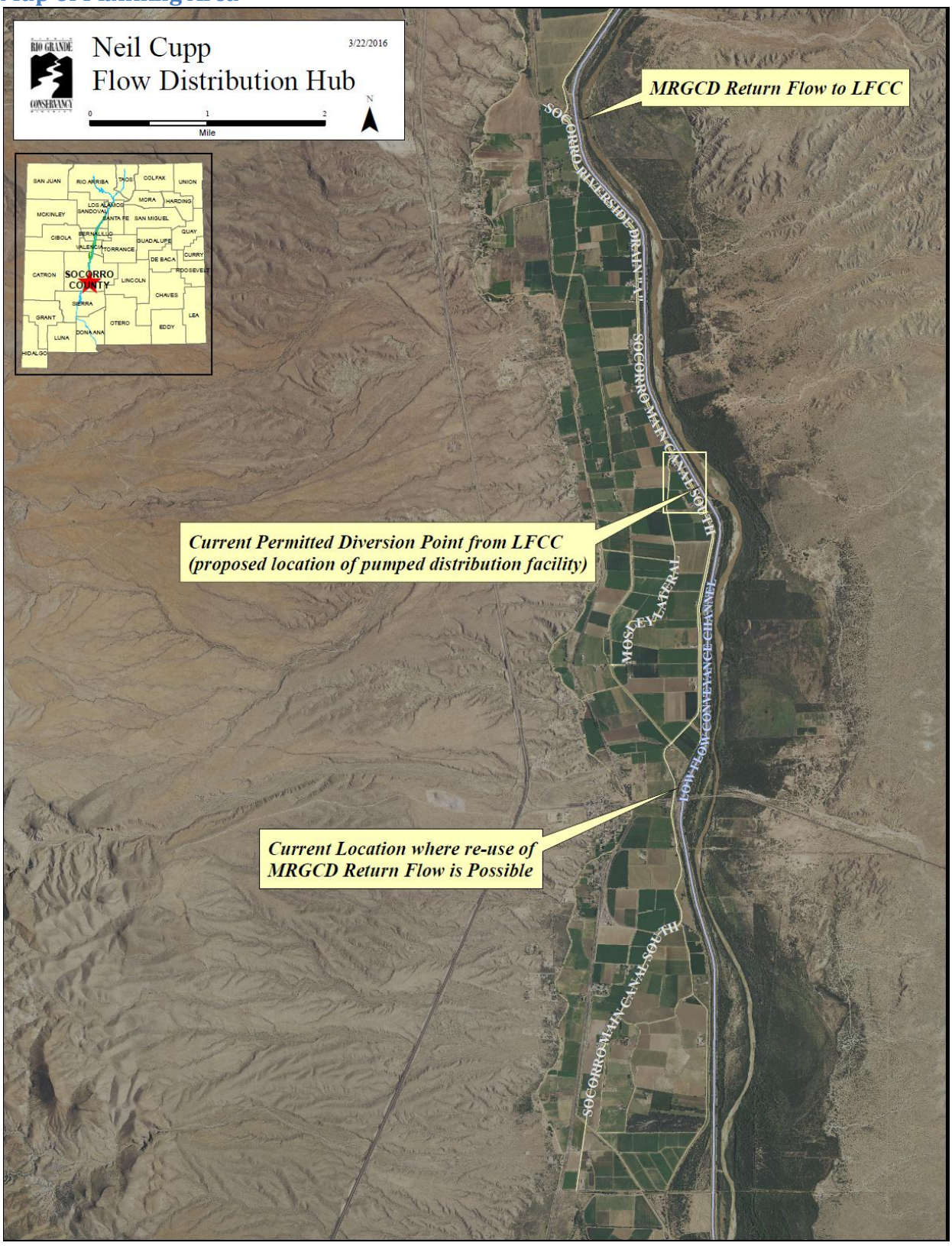
Executive Summary

Date:	April 8, 2016	
Applicant Name:	Middle Rio Grande Conservancy District Albuquerque, Bernalillo County, New Mexico	
Project Financing:	Applicant Share:	$300,000.00
	Reclamation Share:	$300,000.00
	Total Project Cost:	$600,000.00
Project Timeline:	Start date:	August 30, 2016
	Estimated completion date:	June 30, 2018
Located on Federal Facility:	The Low Flow Conveyance Channel is on Reclamation lands and is a Reclamation facility.	

This application requests funding for the Middle Rio Grande Conservancy District (MRGCD or District) to carry out ***Socorro Main Canal South Distribution Hub*** (Project)**,** a FY 2016 WaterSMART Drought Resiliency Project. It is supported by the New Mexico Drought Task Force's *New Mexico Drought Plan* (2006). The District will provide all matching cash and in-kind contributions. The Project will increase the reliability of water supplies through infrastructure improvements (Task A) and will provide benefits for fish, wildlife and the environment (Task D) through the installation of a Neil Cupp Distribution Hub. This measurement device will enable regulation of the Socorro Main South to a precisely desired rate of flow for all lands south of the project. This is expected to produce a tangible annual water savings of at least 5,000 acre feet (AF) and provide new discharge of water to the Rio Grande. This mitigating action also will increase streamflow to levels that are biologically compatible with an endangered species, enhance backwater habitat for endangered species, and improve water quality through decreased temperatures and increased dissolved oxygen levels. The District has worked closely with federal agencies including the U.S. Bureau of Reclamation (Reclamation) following the authorization of the Flood Control Acts of 1948 and 1950. Reclamation's Middle Rio Grande Project and San Juan Chama Project enable the District to utilize the Rio Grande as its primary water supply. Funding for this Project is critical. With the exception of 2015, the MRGCD has been unable to store water normally (i.e., without Rio Grande Compact relinquishments or credits) since 2010 due to drought. Water shortages from long-term and persistent drought have created intense challenges for the organization to balance four key responsibilities: 1) competing water management interests that include the riparian demands along 150 miles of the Rio Grande, 2) irrigation of 60,000 acres for a broad constituency that includes the six Middle Rio Grande Pueblos, 3) annual Rio Grande Compact delivery requirements, and 4) the needs of environmental and endangered species.

Background Data

Map of Planning Area



General Description of Area to be Addressed

Sources of water supply

The MRGCD is a local government organization established by state law under the Conservancy Act of 1923, giving it broad authority to acquire lands and water rights, assess taxes and water service charges, design, construct and maintain facilities for the purposes of providing flood protection from the Rio Grande, and drain swamplands and provide irrigation water to farmland to the four counties and six Pueblos within the middle Rio Grande valley (MRG) -- all without the requirement of the traditional procedures used for adjudication. This authority included the consolidation of 70 separate headings and community acequias (ditches) that served lands throughout the MRG. The service area, which is home to the state's population and economic center, encompasses 150 miles of mostly riparian land and historic flood plain along the Rio Grande in central New Mexico -- from Cochiti Dam in the north to Bosque del Apache Wildlife Refuge in the south, running through the counties of Sandoval, Bernalillo, Valencia and Socorro. The District has worked closely with federal agencies, particularly Reclamation and the U.S. Army Corps of Engineers (USACE), following the authorization of the Flood Control Acts of 1948 and 1950. Reclamation's Middle Rio Grande Project and San Juan Chama Project provide supplemental storage and contract water as well as river maintenance that assist the District in utilizing the Rio Grande as its primary water supply.

Total quantity of water supply managed and supplied

The MRGCD currently delivers water via gravity to over 10,000 irrigators in the MRG. The average annual diversion (2009-2013) to meet these needs is approximately 330,000 AF. This provides an annual farm delivery estimated at about 210,000 AF (65% conveyance efficiency). Actual consumptive use of water by agricultural crops is estimated at around 150,000 AF (70% application efficiency). The majority of water diverted but not consumed is returned to the river system through wasteways and drains. Some water evaporates directly from the surface of canals (estimated 12,000 AF annually) or may be consumed by riparian vegetation along canals. Most canals are earthen and incur some seepage loss. Seepage loss may be intercepted by drains and returned to the river, or may recharge local shallow aquifers which in turn may support additional riparian consumption or non-MRGCD water users (domestic wells).

Water rights involved

The MRGCD holds permits to divert water to serve up to 132,114 acres. As part of the total water rights associated with the diversion permits, the six Middle Rio Grande Pueblos collectively have statutorily recognized water rights for a total of 8,847 acres of Prior and Paramount (priority) lands along with 11,951 acres of newly reclaimed lands for the six Middle Rio Grande Pueblos within and serviced by the MRGCD. Permit 1690 allows the District and the U.S. to store supplemental water at El Vado Reservoir. The District also holds a contract to 20,900 AF of San Juan-Chama Project water. In addition, the MRGCD holds some pre-1907 water rights in the MRG while Permit 0620 entitles the District to divert and utilize “reclaimed” water associated with drainage of lands within the benefitted area. There are other private land owners that hold pre-1907 water rights that are the only water rights in this un-adjudicated and over-allocated basin that may be sold, leased or transferred for uses other than irrigation on the original lands. The District is studying the potential of offering a water bank for these water right holders to utilize in lieu of severing the water rights from the land.

Current water uses

The District currently serves approximately 60,000 acres. In addition to serving irrigators, the MRGCD's system of ditches and drains support a number of critical environmental services including 30,000 acres of a unique and contiguous riparian forest known as the Rio Grande Bosque (bosque). These lands are owned by the District and include existing and future high quality habitat for endangered, threatened and sensitive species, shallow groundwater recharge, urban open space, air pollution and heat island mitigation, and agricultural habitats. In the MRG basin, the U.S. Fish and Wildlife Service administers the Valle de Oro National Wildlife Refuge, Sevilleta National Wildlife Refuge and Bosque del Apache National Wildlife Refuge. The basin is home to endangered species including the Rio Grande silvery minnow and southwestern willow flycatcher, and portions of the basin soon will support critical habitat for the western yellow-billed cuckoo.

Recreation has become an important benefit provided by the District. This is especially true in the Albuquerque metropolitan area, where 73% of the 316 miles of water conveyance channels are used recreationally. Of the nearly 1,200 miles of waterways, 414 miles are classified as having recreational use: 56% of these miles are in the Albuquerque division; 35% in Belen; 7% in Cochiti; and 2% in Socorro. As the District becomes increasingly urban, the undeveloped ditches and the riverbank create a natural preserve with connecting trails within and between communities.

Over time, the District has become the owner of some of the most valuable assets in the MRG. These natural assets are the source of high quality recreation, environmental and ecological activity that provide regional economic returns. They also comprise a regional savings account of water and land -- two natural resources that have become increasingly valuable over time. Growth in the MRG has increasingly impacted the Rio Grande, putting significant pressure on water transfers from agriculture to municipal uses. The District's priority is to do all it can to preserve the agricultural economy and culture of the communities along the Rio Grande.

During the 1930s and 1940s, the MRGCD absorbed 70 community ditches and local acequias which had their own headings from the Rio Grande. Today, in many MRG communities, traditional farming continues because the District's ditches provide the services that the old headings could not provide. In turn, farmers have been sheltered from the changes in the river, the rising cost of maintaining an irrigation system, and the competition for water in a complicated and urbanizing region.

Number of water users served

The District currently delivers water via gravity to over 10,000 irrigators in the MRG.

Current and projected water demand

Assuming no impacts related to climate change, projected water demand within the District for the next 15 years shows no substantial changes but perhaps a slight decrease in demand for agricultural water, and that losses or development of farmland will continue to be somewhat balanced by new farms and domestic wells in both the urban and rural areas within the MRGCD. However, if evapotranspiration continues to rise due to increasing average temperatures, as is currently predicted in the region by the Bureau's *West-Wide Climate Risk Assessment: Upper*

Rio Grande Impact Assessment, an increase of up to 20% in depletions on the riparian and agricultural lands may occur during this period.

The Bureau of Business and Economic Research (BBER) estimates that the state population will reach 2.5 million people by 2020 and 3.7 million by 2060, with the fastest growing regions located in and around the major urban centers along the middle and lower Rio Grande. In the past, increased needs for municipal and industrial uses were met by retirement of irrigated agriculture. Today, the state's largest water utility, ABCWUA, is shifting its water development policy toward preserving irrigated agriculture in the MRG.

Major crops and total acres served

Agricultural production on District lands is estimated to generate $35 to $70 million per year. The District serves approximately 60,000 acres. Major crops include alfalfa hay, other hays and grasses (75% of all crops). The remaining 25% includes fruit trees, oats, barley, chile and corn.

Potential shortfalls in water supply and/or reductions in supply under historical drought conditions

With the exception of 2015, the MRGCD has been unable to store water normally (i.e., without Rio Grande Compact relinquishments or credits) since 2010 due to drought. Water shortages from long-term and persistent drought have created intense challenges for the organization to balance four key responsibilities: 1) competing water management interests that include the riparian demands along 150 miles of the Rio Grande, 2) irrigation of 60,000 acres for a broad constituency that includes the six Middle Rio Grande Pueblos, 3) annual Rio Grande Compact delivery requirements, and 4) the needs of environmental and endangered species.

Estimated quantities of additional supply or reduced consumption associated with the proposed project

The proposed project will enable regulation of the Socorro Main South to a precisely desired rate of flow for all lands south of the project. This is expected to produce a tangible annual water savings of at least 5,000 AF and provide new discharge of water to the Rio Grande. This mitigating action also will increase streamflow to levels that are biologically compatible with an endangered species, enhance backwater habitat for endangered species, and improve water quality through decreased temperatures and increased dissolved oxygen levels.

Water delivery or distribution system

The District maintains and operates the diversion dams, 1,200 miles of canals, laterals, drains and ditches throughout the benefitted area. Water is delivered via gravity to over 10,000 irrigators in the MRG. Most canals are earthen.

Past Working Relationships with Reclamation

Middle Rio Grande Project

At the time of the 1941 flood, the District lacked the tax base to make the necessary repairs and improvements to the irrigation and flood control infrastructure, so in 1951 it entered into a rehabilitation and construction contract with Reclamation. The contract allowed Reclamation to assume the District's debt and -- for a ten year period -- handle operations and maintenance in exchange for a security interest (lien) in the form of property rights in the District's works. It also required the District to repay the non-federal portion of the costs. Reclamation and USACE

jointly planned the comprehensive development of the project. El Vado Dam/Reservoir and its four main stem diversion dams were rehabilitated along with the irrigation system and drains. Kellner or "Jetty" jacks were installed to channelize 127 miles of the Rio Grande to restrict the flood plain, protect the levees and more efficiently convey water. The District repaid the contract in 1999 but the title to District facilities remains unresolved. Reclamation retains a role in water management and river channel maintenance in the middle Rio Grande valley through federal authority associated with the Middle Rio Grande Project and a close relationship with the District. Reclamation operates El Vado Dam for the District. In turn, the District maintains and operates the diversion dams, 1,200 miles of canals, laterals, drains and ditches throughout the benefitted area. Reclamation, District staff and other agencies coordinate daily during the irrigation season on water operations and closely on development of annual water management plans.

San Juan Chama Project

Supplemental water is provided for irrigation in the District through the San Juan-Chama Project. This project consists of a system of diversion structures and tunnels for trans-mountain movement of water from the San Juan River Basin to the Rio Grande Basin. A primary purpose of the San Juan-Chama Project is to furnish a water supply to the MRG for municipal, domestic, and industrial uses as well as provide supplemental irrigation water and incidental recreation and fish and wildlife benefits. The San Juan-Chama Project water has become increasingly important to assist in meeting ESA obligations.

Middle Rio Grande Endangered Species Collaborative Program

In 1994, as a result of the listing of the silvery minnow and the southwestern willow flycatcher, the MRGCD began working closely with Reclamation to meet Section 7 requirements of the Endangered Species Act (ESA) under the 2003 Biological Opinion (BO). The MRG is home to endangered species including the Rio Grande silvery minnow and southwestern willow flycatcher, and portions of the basin soon will support critical habitat for the western yellow-billed cuckoo. Reclamation and the District worked as partners in the preparation of the 2015 Biological Assessment and currently are key members of the Middle Rio Grande Endangered Species Collaborative Program (MRGESA or Collaborative Program). Reclamation funds the implementation of the ESA obligations for species recovery. The Collaborative Program is a partnership involving 16 signatories from federal, state and local agencies, sovereign Pueblos and other organizations that work to protect and improve the status of endangered species along the MRG while simultaneously protecting existing and future regional water uses. Since 1996, the MRGCD has reduced direct river diversions by over 30% through better water management and timing of reservoir releases. These actions helped improve spring spawn and recruitment events, minimized river drying, and improved maintenance of refugial habitats. In addition, the District was a full partner in the preparation of a new Biological Assessment (BA) as a 2016 BO is finalized.

Tribal Trust Responsibilities

Tribal trust responsibilities to the six Middle Rio Grande Pueblos has necessitated that Reclamation and the Bureau of Indian Affairs (BIA) coordinate closely with the MRGCD to ensure that water delivery commitments to the Pueblos are met. The District also is a partner to the Pueblos as they undertake improvements to infrastructure on Pueblo facilities and associated lands to increase irrigation efficiencies. A review of the condition of District facilities on Pueblo

lands has already been performed by BIA that will add value to this important effort. The District is committed to this planning process by participating in the drought planning task force and appropriate stakeholder meetings, providing baseline data, and providing an equivalent of up to $20,000 as in-kind services.

Integrated Water Management in the Rio Grande Basin

Water operations in the MRG rely on the multi-reservoir and river operations actions that are centralized through a coordinated effort by Reclamation, USACE, New Mexico Interstate Stream Commission (NM ISC) and the MRGCD. An operational model, Upper Rio Grande Water Operations Model (URGWOM), provides the technical underpinning for daily, monthly and annual river management and forecasting that assists water managers to coordinate daily to achieve the multi-purpose operational plan. On the upper Chama River, managers are balancing downstream deliveries requirements with fishery support and recreational (boating) flows. In the MRG, flows are managed to meet irrigation demands for both Native American Pueblos' and other MRGCD farmers, municipal diversions, flood control, river sediment transport, Rio Grande Compact deliveries, and endangered species in-river targets and habitat maintenance. It is essential that integrated water management is performed directly with Reclamation due to our joint management role at El Vado Dam/Reservoir where the District pays Reclamation to operate on its behalf.

Technical Project Description

The Project will increase the reliability of water supplies through infrastructure improvements (Task A) and will provide benefits for fish, wildlife and the environment (Task D) through the installation of a Neil Cupp Distribution Hub. This measurement device will enable regulation of the Socorro Main South to a precisely desired rate of flow for all lands south of the project. This is expected to produce a tangible annual water savings of at least 5,000 AF and provide new discharge of water to the Rio Grande. This mitigating action also will increase streamflow to levels that are biologically compatible with endangered species, enhance backwater habitat for endangered species, and improve water quality through decreased temperatures and increased dissolved oxygen levels.

Reclamation entered the MRG with the establishment of the Middle Rio Grande Project. Amongst other efforts involving irrigation and flood control, Reclamation constructed the Low Flow Conveyance Channel (LFCC). The LFCC through Socorro County was intended to convey water efficiently to Elephant Butte Reservoir. To do this, an engineered channel was excavated parallel to the Rio Grande along its west bank and generally several feet below the elevation of the adjacent river channel. The LFCC was very effective at conveying large volumes of water to Elephant Butte Reservoir and played a large role in eliminating New Mexico's Rio Grande Compact debt to Texas.

Construction of the LFCC affected operation of the MRGCD's Socorro Division in two ways. Being below the elevation of the river and adjacent farmlands, as well as MRGCD's drainage system, the LFCC effectively became a "super drain," intercepting groundwater leakage both from the Rio Grande and MRGCD's conveyance system. Where the District once had return flow points back to the river channel, these were now cut off by the LFCC. MRGCD surface waste began to be collected by the LFCC. Accordingly, the District obtained permits to divert the collected water from the LFCC back into its canal system. Reclamation constructed three

large check structures in the LFCC -- at Lemitar, Socorro, and Neil Cupp -- to provide head in the LFCC to return this water via gravity flow to the nearest MRGCD facility. The LFCC checks have been used as needed for decades.

In 1994 the Rio Grande silvery minnow (RGSM) was placed on the federal endangered species list. In 1996 New Mexico entered a period of lessened precipitation which so far has showed no signs of changing. The MRGCD responded to both issues with a program of efficiency and modernization, including funding from Reclamation and the State of New Mexico. This program began with measurement but has evolved to include ever more elaborate automation and water control features in an effort to continue to provide dependable irrigation water supply to MRG agricultural users. MRGCD diversions from the Rio Grande today are half of what they were 20 years ago, reservoir releases have been reduced substantially, and the District's operations have been adjusted to lessen the impact on the RGSM -- all while continuing to successfully serve the remaining 60,000 acres of irrigated farmland in the MRG. That said, the District continues to be pressed for more efficient water management, both by environmental interests seeking improved river conditions for endangered species and by water users concerned about uncertain water supply and the added burden of climate change.

Due to return flow collection and re-use, the southern end of the Socorro Division generally has adequate water supply; however, water is commonly in the wrong channel for efficient use, being in the LFCC instead of the Socorro Main Canal. At present, the Neil Cupp check structure in the LFCC provides gravity flow of collected tail-water into the MRGCD's Socorro Riverside Drain. This water remains at an elevation below that required for delivery to irrigated lands in the area. Re-use of the collected water only becomes possible three miles downstream, where the Socorro Drain is checked up with a control gate to allow water to transfer to the Socorro Main South. Unfortunately, checking the Socorro Drain structure in this manner produces elevated groundwater levels in the vicinity, partly negating the efficiency of water re-use, and producing problems for nearby agricultural lands.

The Project will use the existing Neil Cupp check structure to gravity flow into a below-grade pump well, where water will be lifted, pressurized and directed to three or more potential discharge points. The primary discharge point will be to the MRGCD's Socorro Main South Canal which is located about 50 feet west of the present discharge point, but several feet higher in elevation. The second discharge point will be to the MRGCD's Mosely Lateral which is located about 1,000 feet farther west and about three feet higher in elevation. The third discharge point will be to an outfall channel 400 feet to the east, inside the Rio Grande levee, providing a source of water to augment flows in the river channel for endangered species. See Attachment A.

Lifting and pressurization will be done with the installation of a dedicated pumping facility. This will have a rated capacity of up to 40 cfs (cubic feet per second)(approx. 20,000 gallons per minute), and a pumped lift of up to 12 feet (30' total head, including pipe runs). The facility itself will consist of a concrete inlet structure, below grade concrete pump house, and above grade housing for controls and switches. Pumps will be a pair of 20" split case units, of approximately 180 combined horsepower. Pump controls will utilize variable frequency drives, keeping operating efficiency around 85% over a range of discharges. Electrical requirements

will require the extension of 480 volt 3-phase power to the site. Appropriate safety and security barricades and fencing will be provided around the project. See Attachment B.

Discharge will be via buried pipeline to appropriate locations, using existing MRGCD lands where possible. Discharge to the Rio Grande will require piping water over the LFCC and penetration of the flood control levee. This will be done in cooperation with Reclamation and other area landowners.

Although not a part of this proposal, the District hopes to eventually power the Neil Cupp Distribution Hub with solar energy. The District possesses ample lands on its right-of-way near the project for solar panel arrays, and will be pursuing discussion with Socorro Electric Cooperative about how to generate clean renewable power to offset electrical use of the pumping plant when in operation, and to provide for other Socorro Electric Cooperative users when the plant is off-line.

Evaluation Criteria

Criterion A -- Project Benefits

The Project will benefit water users in the southern end of Socorro County in many ways. The distribution hub will allow water to be placed where it is needed, in the quantity needed, at the right time. This will allow for irrigation deliveries to be precisely scheduled, and for efficient on-farm applications. The increase in predictability and application efficiency will produce a tangible annual water savings of at least 5,000 AF, in contrast to the present delivery system which is gravity fed and opportunistic. Irrigators at the southern end of the Socorro Division have adapted to unpredictable deliveries by taking every drop they can when it happens to be available. This often results in standing water, unnecessary evaporative losses, and damage to crop and soil. It is expected that crop production will increase as a result of a stable and predictable water supply, further increasing the efficient use of water. Predictable water supply will also allow growers greater flexibility in crop selection, producing higher value crops (both economically and nutritionally) and thus enhancing food production in the region.

The present system -- gravity-feeding water to the Socorro Drain, then checking the drain three miles south -- tends to produce extremely high groundwater levels in the area around US Hwy 380. Area farmers have complained for decades about these elevated groundwater levels as well as associated loss of productivity from their lands. The Neil Cupp Distribution Hub will finally allow the Socorro Drain to be operated at its originally intended elevation in the Hwy 380 area, ending the practice of over-checking of the drain at Hwy 380. It will also reduce incidental water depletion from evaporation (i.e., the checked drain results in a large open water surface) and non-native riparian consumption (i.e., salt cedar/Russian olive growth along the highway/drain right-of-way.

In addition, the use of the Socorro Drain in its present form also tends to result in all drain water being forced to the Socorro Main South Canal. In turn, this often causes a large volume of water to enter the Bosque del Apache NWR via the Socorro Main South Canal. This does not provide maximum benefit to the National Wildlife Refuge because their primary water distribution system depends on the LFCC and Socorro Drain confluence; they have limited ability to utilize water entering the refuge through the Socorro Main South Canal. The proposed Neil Cupp

Distribution Hub will directly benefit Bosque del Apache by stabilizing the flow arriving at the NWR, reducing the portion that enters via the Socorro Main South Canal, and increasing the portion arriving via Socorro Drain/LFCC.

During times of extreme drought and severely reduced supply, the Neil Cupp Distribution Hub will allow the entire Socorro Division to operate on a reduced water supply. Diversion from the Rio Grande at San Acacia Dam, or the required delivery via the Unit 7 Drain system from Isleta Dam, will be reduced while continuing to meet irrigation delivery needs. Water savings from the Project cannot be precisely quantified, but they can be estimated using annual supply (approximately 5.5 feet/acre) and outflow rates from the Socorro Division (20-30K AF). The result will be an annual water savings of at least 5,000 AF.

This new distribution hub will also produce significant environmental benefits. At present, there are no return flow points to the river channel within the San Acacia reach of the Rio Grande. This river reach experiences frequent drying during the summer and infusions of fresh water are believed by the U.S. Fish and Wildlife Service to be critical to maintaining local populations of the endangered RGSM. Reclamation currently maintains a temporary pumping location just below the Neil Cupp check structure, lifting water to the Rio Grande when needed. Operation of this temporary pumping plant is costly, in terms of labor, fuel (diesel fired pumps), and nuisance (noise abatement procedures for nearby residents). The Neil Cupp Distribution Hub will replace the function of this temporary pumping plant, allowing water to be returned to the river channel for greater periods of time, with much less cost and nuisance. During times of the year during which Reclamation is releasing water from storage for the RGSM, the proposed project will give MRGCD the capability to efficiently route "minnow water" all the way from Isleta Dam (about 60 miles north), through its canal system, for delivery to RGSM habitat areas downstream of the Neil Cupp Distribution Hub.

Additionally, the outfall to the Rio Grande from the Neil Cupp Distribution Hub presents an opportunity for combined habitat restoration and scientific research. The pipe outfall will deliver water to the east side of the LFCC and through the levee. A decision must be made about how the water will then enter the channel of the Rio Grande. It is expected that an open, meandering channel across the floodplain will be excavated. This could be configured as critical habitat for the Rio Grande silvery minnow, southwestern willow flycatcher, western yellow-billed cuckoo and/or the New Mexico meadow jumping mouse. The MRGCD will be supportive of experimental habitat treatments along this channel. The channel may also function as a refugium for the RGSM during times of extreme drought. The construction of this outfall channel by MRGCD will support MRGCD (including Reclamation and others) commitments to the USFWS to construct habitat throughout the MRG valley for endangered species.

Criterion B -- Drought Planning and Preparedness

Although the District itself has not developed and adopted a formal drought plan, the staff works closely with Reclamation, the New Mexico Interstate Stream Commission (NMISC), the New Mexico Office of the State Engineer (NM OSE), and other land management agencies to develop water operations plans and wildland fire management plans as part of its drought contingencies. Drought-related activity of the MRGCD has been guided by several plans including:

- NM OSE's *State Water Plan* (2003)
- NM Drought Task Force's *New Mexico Drought Plan* (2006)

- *Recommendations from the Governor's Drought Task Force* (2008)
- NM OSE's *Middle Rio Grande Regional Water Plan* (2004, draft 2016)

See Attachment C for *Recommendations from the Governor's Drought Task Force* (2008). On Page 6 of this report, the NMISC specifically addresses working closely with the MRGCD to enhance and improve irrigation systems infrastructure in tandem with improving operations via the implementation and improvement of the Decision Support System as a means to further reduce river diversions, optimize irrigation deliveries and help with meeting Rio Grande Compact delivery obligations that are equally important to New Mexico and the MRGCD.

The above documents provide general guidance for planning water-year operations and out-year planning regarding managing for drought and potential effects of long-term climatic variability. These efforts were performed with multiple groups of stakeholders ranging from the economic development sector, farming and ranching, recreation and tourism, and environmental interests. In addition, the MRGCD is teaming with Reclamation to perform an Upper Rio Grande Basin Study under the WaterSMART authority in order to address water predictive temperature increases and associated with higher potential for climate variability that has been observed over the last decade or longer.

Please note that the District it has applied for the *WaterSMART: Drought Contingency Planning Grant for FY 2016*.

Criterion C -- Severity of Actual or Potential Drought Impacts to be Addressed by the Project

The proposed project will address risks to water supplies for water users and other District constituents that include 10,000 irrigators, the six MRG Pueblos and municipalities that benefit from the operation from the District. The magnitude and frequency of water supply shortages are currently severe, with water shortages up to 50% in a given year based on recent hydrology, increased fire risk due to persistent drought, impacts to the ecosystem and associated endangered species due to water shortages and fire risk, and socioeconomic consequences related to these events.

The MRG is highly dependent on Rio Grande Compact deliveries to the Middle Rio Grande Project. During persistent drought, the Middle Rio Grande Project places the MRG in a status associated with Article VII of the Rio Grande Compact, which limits and prohibits supplemental storage in El Vado Reservoir. This further exacerbates water shortages in the MRG.

The cities of Albuquerque and Santa Fe recently began diverting water from the Rio Grande. This new activity requires ongoing coordination with the MRGCD to ensure the entire system is optimized so that municipalities meet their diversion permit conditions, and that low flow conditions and impacts are mitigated. A key outcome of the Plan will be to quantify existing and potential drought risks in the MRG to specific sectors and create a set of mitigation and response actions to address those risks.

The Plan will help define the extent and vulnerabilities within the MRG to wide variations in water supplies and to persistent drought that is projected to continue in the desert southwest. The District survives on the run-of-the-river as its primary water supply. This

means the MRGCD is interconnected with multiple municipal entities that either direct divert or indirectly utilize surface water through relational ground water pumping. Supplemental supplies such as native storage in El Vado Reservoir have been significantly restricted due to Rio Grande Compact requirements and the San Juan-Chama Project water supplies have, for the first time since the project's construction in the early 1970s, experienced shortages for 18 separate project contractors including the MRGCD, ABCWUA and other MRG communities.

The current drought has already produced impacts resulting in economic losses during shortage operations in three of the past ten years, and it has impacted municipalities that have made heavily invested in surface water use strategies to reduce groundwater pumping throughout the region. The Plan will analyze future water supply scenarios based on climate change modeling and other available tools to determine system-wide vulnerabilities and ranges of impacts.

Recognizing the strong link between economic development and water supply, the New Mexico Legislature in 2013 passed Senate Memorial 8, the purpose of which was to bring together representatives from governmental jurisdictions, agencies, tribes and acequias to discuss how to maximize the MRG's water supply. The final report, *Middle Rio Grande Council of Governments, 2014*, identified supporting efficiency improvements as one of five significant ways to maximize the water supply.

In 2014, Senator Udall introduced the New Mexico Drought Bill (S.1936 NM Drought Preparedness Act of 2015) which focuses on development of a federal, state, tribal and MRGCD partnership toward improving water management and system efficiencies to help the region cope with short-term drought and long-term effects of climate change.

The report, *West-Wide Climate Risk Assessment: Upper Rio Grande Impact Assessment*, presents median projections of climate change models that show flows resulting from typical high mountain snowmelt runoff in the Rio Grande at Otowi gage will decrease by approximately 30% by 2100, and that extreme rain (monsoon period) events are likely to increase, potentially keeping a similar annual volume but providing less predictability as to timing and location of flows in the MRG. This could lead to fewer water rights being served during the peak irrigation season from June to September. Further, the observed trends in average temperature rises will increase evapotranspiration rates for both the riparian vegetation and crops potentially resulting in a higher demand for the same number of acres over time if these trends continue. Given these projected dire scenarios, it is critical for the MRGCD to develop a plan that addresses mitigation and response actions for water efficiency and water management during drought periods.

Over the past decade, the MRG has experienced levels of drought ranging from abnormally dry to exceptional drought. Appendix D includes U.S. Drought Monitor graphs (2010-2015) for the month of June, illustrating that the water supply storage conditions are at an all-time low even with the availability of imported water from the San Juan-Chama Project. In fact, the San Juan-Chama Project experienced shortages for the first time since its inception in 1970.

The last four years featured severe to exceptional drought conditions, leading to significant water shortages for the MRGCD during the July to September timeframe. In two of those years, no

significant storage was available to meet the shortages due to drought impacts on the Rio Grande Project (Elephant Butte Irrigation District, El Paso Water Improvement District #1 and treaty obligations to Mexico). As a result, El Vado Reservoir is under storage restrictions as required under Article VI of the Rio Grande Compact, minimizing the use of spring runoff (if available) for storage.

The severity of the drought has led to significant wildland fires occurrence and potential of occurrence. The situation has strained the District and other local, state and federal resources in responding to fires. The resulting damage has affected watershed health, wildlife habitat and water quantity/quality for decades. The MRGCD is a partner with a number of state and local governments in developing emergency response plans and actions as well as preventative treatments of the bosque, which is owned primarily by the MRGCD. The bosque forest and its flora and fauna suffered many fire events and other impacts due to prolonged drought, causing untold losses to scarce government resources, lost opportunity costs within the surrounding communities, and significant and perhaps irretrievable impacts to the cottonwood-dominated environment.

In addition, summer monsoon events on the burned watersheds of the Jemez and Sangre de Cristo mountain ranges -- which bracket the MRG -- were the site of numerous debris flows and ash which made their way into streams, reservoirs and the Rio Grande. This caused fish kills, flow blockages, levee damage and higher levels of sedimentation. These factors are on-going and will likely require much investment to manage the impacts and restore the watersheds.

Criterion D -- Project Implementation

Describe the implementation plan of the proposed project. Include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones and dates.

The award date is estimated to be August 2016. All work and required submittals will be completed by June 30, 2018. Major tasks, milestones and dates are as follows.

<u>September 2016</u>
Contract signed between MRGCD and Reclamation
Engineering design and drawings (MRGCD)
Develop detailed work plan (MRGCD)
NEPA review (Reclamation)

<u>November 2016</u>
Review and approval of plans
Placement of orders for pumps (MRGCD)
Initiation of construction (MRGCD)

<u>February 2017</u>
Completion of pump house and intake structure (MRGCD)
First semiannual financial (SF-425) and interim report due

July 2017
Delivery and installation of pumps (MRGCD)
Permitting for pipeline construction (MRGCD)
(Service/Reclamation permitting where critical habitat or crossing LFCC is involved)
(permitting with Socorro County may be needed if pipeline crossed under roadway)

August 2017
Electrical service installation (Socorro Electric Cooperative)
Second semiannual financial (SF-425) and interim report due

September 2017
Initiation of pipeline installations (post-nesting season)

February 2018
Completion of pipelines
Third semiannual financial (SF-425) and interim report due

March 2018
Testing and commissioning of facility

April 2018
Final project submittals to Reclamation

June 2018
Final financial (SF-425) and report due

Describe any permits that will be required, along with the process for obtaining them.
Above grade crossing of the LFCC with a 30" pipeline to discharge water to the Rio Grande will require approval and permitting by Reclamation. This will be coordinated by the MRGCD and Reclamation's Albuquerque Area Office. The MRGCD and Reclamation frequently license such crossing to each other in the MRGCD service area, due to the overlap and proximity of our respective facilities.

Construction of the pipeline termination in the Rio Grande floodway will occur in the designated critical habitat for RGSM and SWFL. Although the MRGCD regularly constructs and maintains its facilities within designated critical habitat (mostly MRGCD-owned lands), the proposed project will be considered outside the normal scope of irrigation operations for MRGCD and thus will be coordinated with the Fish & Wildlife Service (Service). At a minimum, construction will occur outside of the SWFL nesting season (April 30-Sept 15). The MRGCD will request input from the Service on how to configure the pipeline termination and discharge channel to the river in such a way as to enhance its suitability as habitat for listed species. The MRGCD will also seek input from the Middle Rio Grande Endangered Species Collaboratiive Program on configuration of the pipeline and discharge channel to encourage the use of the Neil Cupp Distribution Hub in Adaptive Management for the listed species.

Penetration of the levee along the east side of the LFCC may require permitting by the U.S. Army Corps of Engineers, in addition to Reclamation.

Electrical service to the site may require permitting by Socorro County. Also, a possible alignment for the pipeline discharge to the Mosely Lateral may require crossing a Socorro County maintained farm road. If this route is selected, Socorro County will be contacted for appropriate licensing of a road crossing, and permits for road closure during the construction process.

Identify and describe any engineering or design work performed specifically in support of the proposed project.

Upon award, design and engineering work will begin on the project. MRGCD engineers will provide a full set of construction drawings and plans to Reclamation with details of pump installation, structures, inlet and outlet features, pipelines, and electrical supply. Pump drawings will be provided by the selected pump manufacturer, along with appropriate operating characteristics. Electrical drawings may be provided by Socorro Electric Cooperative, pump manufacturer, or others. Engineering drawings will be approved by registered professional engineer in the State of New Mexico. Final submittal on the project will include copies of all engineering, pump, and electrical drawings.

Criterion E -- Nexus to Reclamation

How is the proposed project connected to a Reclamation project or activity?

The project is planned in an area that is within Reclamation's Middle Rio Grande Project and involves the Low Flow Conveyance Channel that is owned and maintained by Reclamation. The project will provide a collection point for drain returns so it can be efficiently delivered to an irrigation delivery canal and/or to an area in the Rio Grande that is historically difficult to keep water in for Rio Grande silvery minnow and southwestern willow flycatcher habitat. The District is a partner with Reclamation in the MRG Water Operations Biological Assessment (BA) and this area is an important component in our collective commitments in that BA.

Does the applicant receive Reclamation project water?

Yes, the MRGCD receives Reclamation project water from the Middle Rio Grande Project and the San Juan-Chama Project.

Is the project on Reclamation project lands or involving Reclamation facilities?

Yes, the Low Flow Conveyance Channel is in on Reclamation lands and is a Reclamation facility.

Is the planning area in the same basin as a Reclamation project, facility, or activity?

Yes, the planning area is located within the Middle Rio Grande Project.

Will the proposed work contribute water to a basin where a Reclamation project is located?

Yes, the proposed work will contribute water to the Middle Rio Grande Basin.

Will the project help Reclamation meet trust responsibilities to any tribe(s)?

This project is below the tribal lands and facilities served by the District; however, this is a component of the District's ESA commitments that helps provide regulatory coverage to all District constituents including the six MRG Pueblos.

Performance Measures

The benefits of the Neil Cupp Distribution Hub to the area's water supply will be readily quantifiable after completion. Measurement devices included in the project will allow for a full and detailed accounting of water arriving at the hub, and where it is distributed leaving the hub. Overall inflow and outflow to the hub will remain unchanged, but the distribution of water to various channels before and after the project will be different. There are existing stream gauges on the Socorro Main South and Socorro Drain where they leave the MRGCD service area. These flow measuring points are currently characterized by frequent and dramatic changes in flow. The Neil Cupp Distribution Hub is expected to stabilize these changes in flow, and give area water managers the ability to increase or decrease these flows as desired, in response to scheduled irrigation needs. The effectiveness of the project will be apparent by comparisons of annual discharge and hydrograph variability before and after, showing that water was able to be delivered to locations where it was needed, and in quantities appropriate for acreage being irrigated. Elimination of variability almost surely leads to a reduction in on-farm application, since interruptions during irrigation delivery reduce application efficiency.

In addition, the complete picture of water entering the service area at the Neil Cupp Distribution Hub, compared to water leaving the service area at the outflow gauges, will allow quantification of the benefits of the project. The present inflow is unknown, but as previously noted it is not expected to change due to the construction of the project, at least initially. With the assumption that inflow remains the same (expected), an increase in overall outflow from the south boundary of the service area will be indicative of water savings (expected).

Examining these gauge records in finer detail will reveal subtle changes in distribution of water leaving the service area. The current practice of over-checking the Socorro Drain at Highway 380 results in all flow being forced into the Socorro Main South, producing the aforementioned frequent changes in flow on that canal. The Socorro Main South has become a feast-or-famine system. Being able to control flow into the Socorro Main South and precisely meet scheduled irrigation is expected to produce a general result of more water leaving the service area in the Socorro Drain, and the change in annual volume before and after the project will be evident.

A later outcome of the project, if the expected increase in overall outflow results, is a change in upstream operating practices, at the point where water is diverted from the river at San Acacia Dam. If agricultural needs in the service area can be met with a smaller inflow to the service area, the diversion can be reduced accordingly, allowing this volume of water (estimated 5,000+ AF) to remain flowing downstream in the river channel. This can be ascertained after the operational changes have been made by comparison of gauge records for the Socorro Main Canal at San Acacia, and the San Acacia Diversion control gate.

Environmental and Cultural Resources Compliance

Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

The proposed project will involve construction activities along MRGCD facilities in Socorro county. The primary project site is along an earthen channel, subject to occasional dredging/cleaning/mowing, and is regularly disturbed by MRGCD maintenance workers and equipment. The proposed project will require excavation, earthwork, concrete placement, etc. It will produce a slight increase in dust, noise, vehicular and human traffic in the project area while construction is occurring, although these are normal activities in the area. Normal MRGCD construction practices will be employed to prevent construction impact to water in nearby MRGCD canals and drains. There are two farm houses near the project site (700 ft and 1,400 ft away). Residents of these farm houses will be notified about the project, and any concerns about noise, dust, or vehicle traffic they may have will be addressed. Although activity will increase in intensity for a short time during construction of the project, residents of these farmhouses are accustomed to similar activities by MRGCD during normal operation and maintenance of canals and drains in the area.

Placement of pipelines for discharging water to canals will also require excavation and earthwork. These will be primarily on MRGCD canal rights of way, which are disturbed areas, subject to regular grading and mowing. Installation will produce a slight increase in dust, noise, vehicular and human traffic in the project area while construction is occurring, although these are normal activities in the area. Normal MRGCD construction practices will be employed to prevent construction impact to water in nearby MRGCD canals and drains.

Placement of pipelines for discharging water to the channel of the Rio Grande will also require excavation and earthwork. This work will be across a Reclamation-maintained facility (LFCC), and may involve lands owned by MRGCD, Reclamation, or the State of NM. All work on these lands will be coordinated with the appropriate agency. Penetration of the levee to the east of the LFCC will require permitting/coordination with Reclamation and the US Army Corps of Engineers. Once inside the levee, the project will occur within designated critical habitat for RGSM and SWFL. Activities within critical habitat areas will be coordinated with the Service (no construction during nesting/rearing period for SWFL.

Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

Listed species include the Rio Grande silvery minnow, southwestern willow flycatcher, western yellow-billed cuckoo and/or the New Mexico meadow jumping mouse. Critical habitat for RGSM and SWFL may be directly affected by the proposed project. Effects are expected to be beneficial, through providing a delivery of water to the critical habitat areas, and will be coordinated with the Service. The proposed project will not directly affect Mouse habitat. The ability to direct distribution of water from the proposed project, and an expected increase in flow

leaving the service area via the Socorro Drain may provide a benefit to Mouse habitat located on the Bosque del Apache NWR.

The outfall to the Rio Grande from the Neil Cupp Distribution Hub presents an opportunity for combined habitat restoration and scientific research. The pipe outfall will deliver water to the east side of the LFCC and through the levee (designated Critical Habitat for RGSM and SWFL). A decision must be made about how the water will then enter the channel of the Rio Grande. It is expected that an open, meandering channel across the floodplain will be excavated. This could be configured as critical habitat. The MRGCD will be supportive of experimental habitat treatments along this channel. The channel may also function as a refugium for the RGSM during times of extreme drought. The construction of this outfall channel by MRGCD will support MRGCD (including Reclamation and others) commitments to the USFWS to construct habitat throughout the MRG valley for endangered species.

Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the US?" If so, describe and estimate any impacts the proposed project may have.

The proposed project will change the distribution of water between the LFCC, Socorro drain, Socorro Main South and Mosely Lateral. There are no negative impacts expected.

When was the water delivery system constructed?

The existing MRGCD water delivery system, including the Socorro Drain, Socorro Main South, and Mosely Lateral were constructed between 1928 and 1935. The MRGCD canals replaced the function of historic acequias in the area dating back to the early 1800's. The LFCC was constructed by Reclamation between 1951 and 1959.

Will the proposed project result in any modification of, or effects to, individual features of an irrigation system (e.g., headgates, canals or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

The proposed project will not result in modifications to individual features of the MRGCD irrigation system, with the exception of the present inflow from the LFCC to the Socorro Drain. This inflow structure is a round cast iron headgate attached to corrugated metal pipe, probably installed in the mid-1980's. It is a minor structure, with no surrounding concrete walls. Modification will eliminate the pipe termination in the Socorro Drain, and redirect it to the concrete pump inlet structure of the proposed project.

Are any buildings, structures or features in the irrigation district listed or eligible for listing on the NRHP? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office an assist in answering this question.

The MRGCD's El Vado Dam and El Vado Reservoir, and several of the MRGCD diversion dams, are listed on the NRHP. The Corrales siphon, abandoned Atrisco Heading, and other structures are eligible or already listed on either the NRHP, or with the NM SHPO. Features or structures in the immediate area of the project site which might be eligible for listing on the NRHP or of interest NM SHPO will not be affected by the project.

Are there any known archeological sites in the proposed project area?

No, none are known, and the project area is already extensively disturbed.

Will the proposed project have a disproportionately high and adverse impact on low income or minority populations?
No.

Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?
No.

Will the proposed project contribute to the introduction, continued existence or spread of noxious weeds or non-native invasive species known to occur in the area?
No.

Existing Drought Plan

See Appendix C for Existing Drought Plan and Appendix D for Drought Graphs.

Required Permits or Approvals

Above grade crossing of the LFCC with a 30" pipeline to discharge water to the Rio Grande will require approval and permitting by Reclamation. This will be coordinated by the MRGCD and Reclamation's Albuquerque Area Office. The MRGCD and Reclamation frequently license such crossing to each other in the MRGCD service area, due to the overlap and proximity of our respective facilities.

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Letters of Support

See Appendix E for Letters of Support.

Official Resolution

RESOLUTION OF THE BOARD OF DIRECTORS
OF THE MIDDLE RIO GRANDE CONSERVANCY DISTRICT

AUTHORIZING APPLICATION FOR A WATERSMART GRANT THROUGH THE U.S. BUREAU OF RECLAMATION FOR THE INSTALLATION OF A SOCORRO MAIN CANAL SOUTH DISTRIBUTION HUB

M-03-14-16-142

WHEREAS, the reliability of water supply is essential to all water users within the Middle Rio Grande Conservancy District (MRGCD); and

WHEREAS, the MRGCD relies on the Rio Grande to meet customer demand, including 70,000 acres or irrigated agriculture within four counties and six Indian Pueblos, as well as operations required to meet the MRG ESA Biological Opinion; and

WHEREAS, the District desires to increase system efficiency and optimize its practices; and

WHEREAS, the U.S. Bureau of Reclamation (Reclamation) has made available funds through its WaterSMART grant program for the purpose of supporting Drought Resiliency Projects that seek to increase the reliability of water supplies through infrastructure improvements, improve water management through decision support tools, modeling and measurement, facilitate the sale, transfer or exchange of water, and/or provide protection for fish, wildlife and the environment; and

WHEREAS, the MRGCD has prioritized the installation of a Socorro Main Canal South Distribution Hub water measurement device to enable precise rate of flow regulation for all lands south of the project as well as increase discharge of water to the Rio Grande to improve habitat for endangered species protection; and

WHEREAS, the MRGCD does hereby commit to being a cost share and local sponsor of the Drought Resiliency Project if the MRGCD is awarded a grant. This includes the cost-share of up to $300,000 in cash and/or in-kind services that the Board of Directors will accordingly budget for in the District's FY17 and FY 18 operating budgets; and

WHEREAS, the MRGCD will work with Reclamation to meet established deadlines for entering into a cooperative financial agreement and completing the work schedule within the designated timeframe from the date of award, and

WHEREAS, the WaterSMART grant procedures requires a resolution of the governing body authorizing the submission of an application to Reclamation.

NOW THEREFORE, BE IT RESOLVED that the MRGCD Board of Directors does hereby authorize the CEO/Chief Engineer to submit an application to the U.S. Bureau of Reclamation requesting consideration for a Drought Resiliency Project grant to fund the Socorro Main Canal South Distribution Hub.

DATED AND RESOLVED this 14th day of March 2016.

MIDDLE RIO GRANDE CONSERVANCY DISTRICT

Derrick J. Lente, Chairman

ATTEST:

David Fergeson, Secretary/Treasurer

Appendix A -- Additional Project Maps

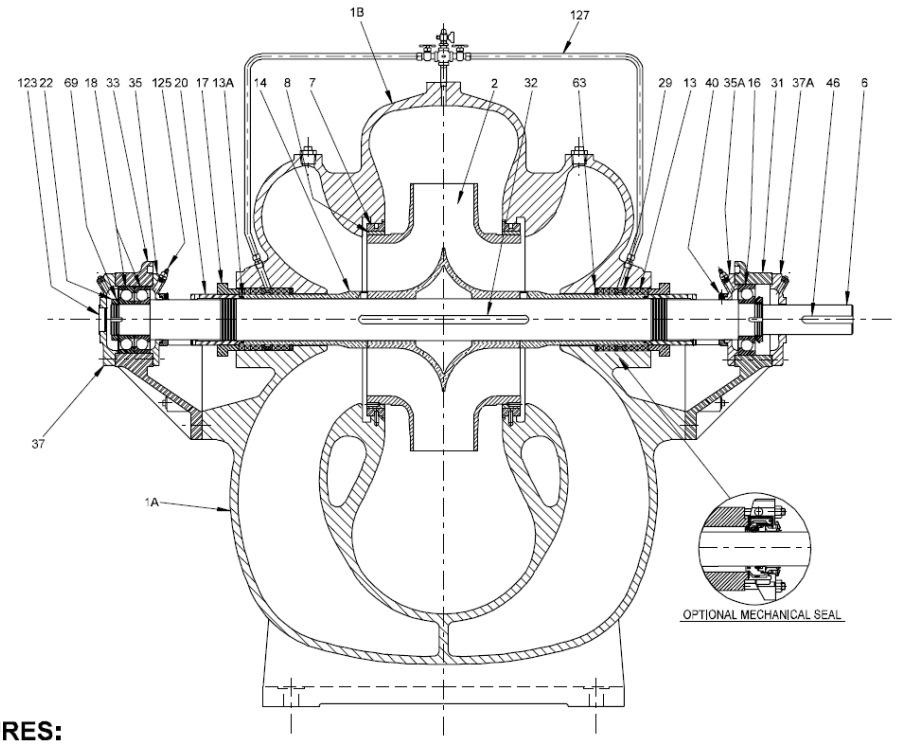

Neil Cupp
Flow Distribution Hub
3/22/2016
0
200
400
Feet
N
MOSLEY LATERAL
SOCORRO MAIN CANAL SOUTH
SOCORRO RIVERSIDE DRAIN "A"
LOW FLOW CONVEYANCE CHANNEL
Deliver to River
Deliver to Mosely Lateral
Deliver to Socorro Main Canal
Bypass to LFCC

Appendix B -- Pump Details

Peerless
Tocoa, Georgia
U.S.A.

24 x 20 MAD
SPLIT CASE PUMP

SECTION A20
PAGE 21
DATE: JAN. 2,2000



FEATURES:

- REPLACEABLE PACKING BOX BUSHING PROVIDED TO PROTECT CASING FROM PACKING WEAR
- MACHINED MOUNTING SURFACES
- DEFLECTORS PROVIDED TO PREVENT PRODUCT FROM ENTERING BEARING HOUSINGS
- CASING RINGS PROVIDED TO PROTECT CASING FROM WEAR
- DYNAMICALLY BALANCED IMPELLER
- HYDROSTATICALLY TESTED TO 1 1/2 TIMES SHUT-OFF
- INTEGRALLY CAST PACKING BOXES
- PREDRILLED AND TAPPED PACKING BOX DRIP POCKETS FOR REMOVAL OF PACKING BOX LEAKAGE
- SHAFT SLEEVES LOCKED AGAINST ROTATION BY IMPELLER KEY

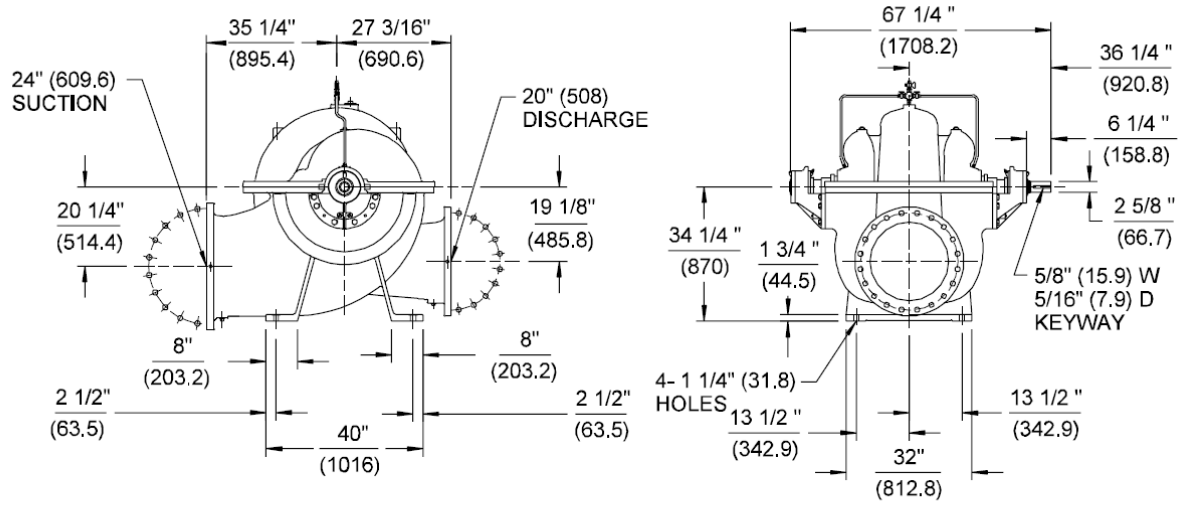
ITEM	DESCRIPTION	MATERIAL	ITEM	DESCRIPTION	MATERIAL
1A	LOWER CASING	Cast Iron - ASTM A48-CL40	31	INBOARD BRG HOUSING	Cast Iron - ASTM A48-CL30
1B	UPPER CASING	Cast Iron - ASTM A48-CL40	32	IMPELLER KEY	Stainless - AISI 304
2	IMPELLER	ASTM B148 C95400 Bronze	33	OUTBOARD BRG HSG	Cast Iron - ASTM A48-CL30
6	SHAFT	AISI 4340	35	INBOARD BRG COVER	Cast Iron - ASTM A48-CL30
7	CASING RING	ASTM B505 C95200 Bronze	37	OUTBOARD BRG COVER	Cast Iron - ASTM A48-CL30
8	IMPELLER WR RING	ASTM B505 C95400 Bronze	40	DEFLECTOR	Aluminum
13	PACKING	TFE Graphite Impregnated	46	COUPLING KEY	AISI 1018 Cold Drawn Steel
13A	SHAFT SLEEVE O-RING	Nitrile (Buna N)	63	STUFFING BOX BUSHING	ASTM B505 C95400 Bronze
14	SHAFT SLEEVE	ASTM B505 C95400 Bronze	69	BEARING LOCKWASHER	Steel - Mfg Standard
16	INBOARD BEARING	Mfg Standard	123	BEARING END COVER	Steel - Mfg Standard
17	PACKING GLAND	ASTM B584 C83600 Bronze	125	GREASE FITTING	Mfg Standard
18	OUTBOARD BEARING	Mfg Standard	127	SEAL WATER PIPING	Copper Tubing
20	SHAFT SLEEVE NUT	ASTM B505 C95400 Bronze			
22	LOCK NUT	Steel - Mfg Standard			
29	LANTERN RING	ASTM B505 C95400 Bronze			

Emerson
Toccoa, Georgia
U.S.A.

24 x 20 MAD
SPLIT CASE PUMP

SECTION	A20
PAGE	22
DATE:	JAN. 2,2000

	SUCTION					DISCHARGE				
FLANGE	O.D.	THK	HOLES	SIZE	D.B.C.	O.D.	THK	HOLES	SIZE	D.B.C.
125#	32 1/4" (819.2)	2" (50.8)	20	1 3/8" (34.9)	29 1/2" (749.3)	27 3/4" (704.9)	1 3/4" (44.5)	20	1 1/4" (31.8)	25" (635)
250#	36" (914.4)	2 3/4" (69.9)	24	1 11/16" (42.9)	32" (812.8)	30 1/2" (774.7)	2 1/2" (63.5)	24	1 3/8" (34.9)	27" (685.8)



ENGINEERING DATA:

GENERAL	
BARE PUMP WEIGHT	6900#
MAXIMUM OPERATING TEMPERATURE - F °	200
MAXIMUM WORKING PRESSURE	110
HYDROSTATIC TEST PRESSURE	165

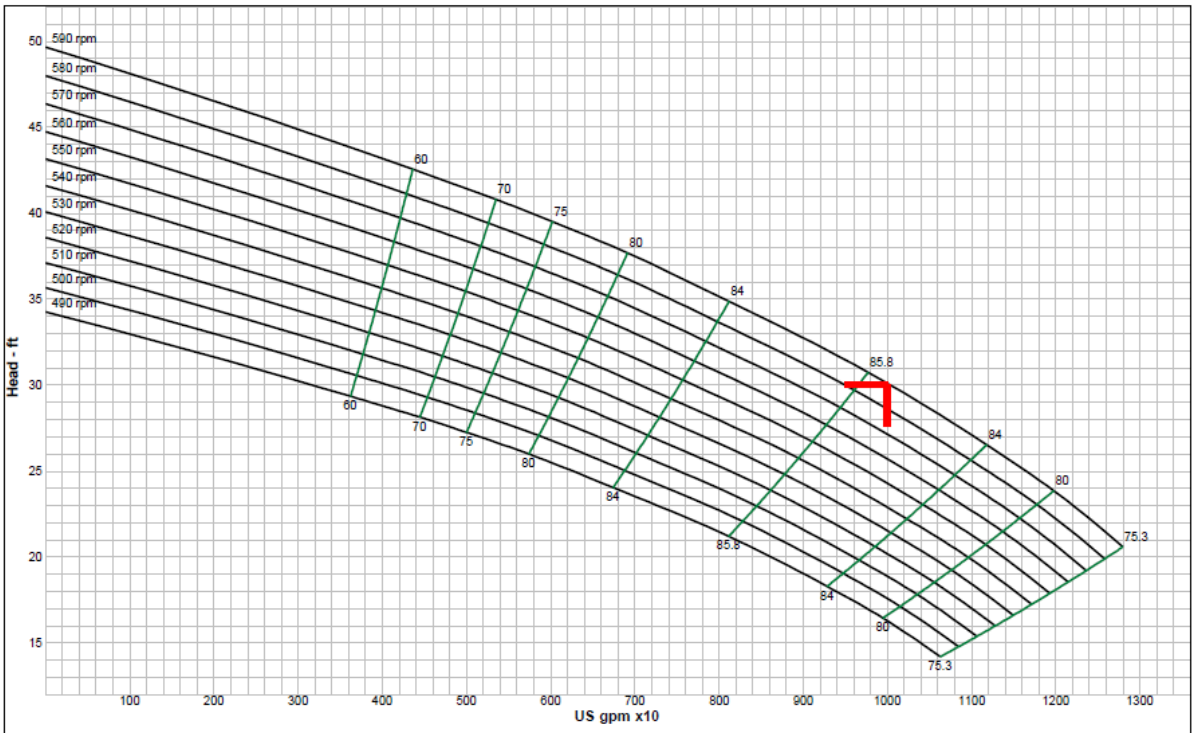
CASING	
CASING MATERIAL	CAST IRON
STANDARD DISCHARGE FLANGE RATING	125# - FF
STANDARD SUCTION FLANGE RATING	125# - FF
CASING WALL THICKNESS	3/4"
VENT/PRIMING NPT	2"
GAUGE NPT	1/4"
DRAIN NPT	1"

IMPELLER	C-4097	C-3966	C-3966A
MAXIMUM DIAMETER	21"	21 1/2"	22 3/8"
MINIMUM DIAMETER	16 3/4"	18"	19 1/2"
MAXIMUM SHPERE	2 1/2"	2 1/2"	2 1/2"
NUMBER OF VANES	6	7	7
EYE AREA SQ. IN.	247	267	267
WEIGHT	350#	380#	380#
WR ^2 for MAXIMUM DIAMETER (LBS-FT^2)	153	180	196
NOMINAL DIAMETRICAL WEAR RING CLEARANCE	.017"	.017"	.017"

SHAFT AND BEARING		
SHAFT DIAMETER	AT COUPLING	2 5/8"
	AT IMPELLER	3 3/4"
	AT SHAFT SLEEVE	3 3/4"
CENTER TO CENTER OF BEARINGS		49 3/4"
KEYWAYS	AT COUPLING	5/8" X 5/16"
	AT IMPELLER	3/4" X 3/8"
INBOARD BEARING		5314
OUTBOARD BEARING		7314 BECB

PACKING BOX		
SLEEVE O.D.		4 1/2"
PACKING BOX BORE		5 9/16"
PACKING BOX DEPTH		4 3/4"
BOX INLET NPT		3/8"
PACKING	SIZE	1/2"
	NUMBER OF RINGS	7
	WATER SEAL RING WIDTH	1"

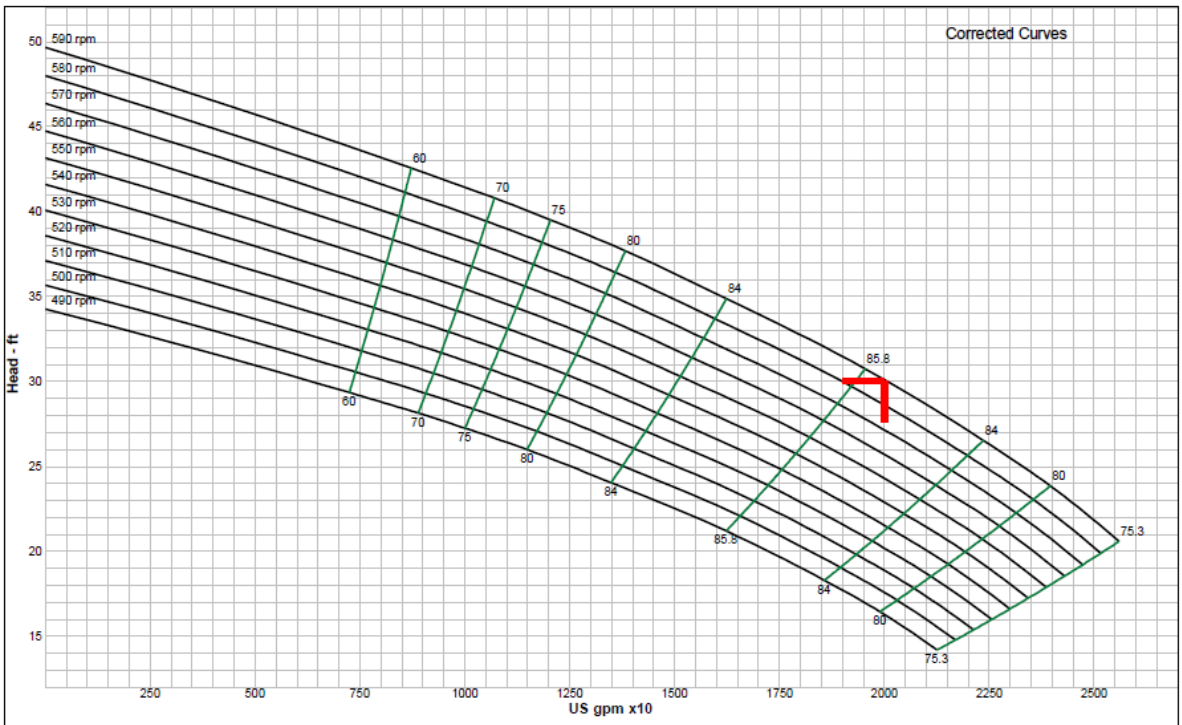
A02-74159



In accordance with the Hydraulic Institute Standards, pump is guaranteed for one set of conditions. Performance guarantees are based on shop test and when handling clear, cold, fresh water at sea level and at a temperature no greater than 85 degrees F. Suction lift must not exceed that shown on curve.

Company: Patterson Pump Company	Patterson 60 Hz Pumps	Size: 24x20 MAD-F
Name:	Catalog: Patterson Pumps 60HZ, Vers 1.2	Speed: 490 - 590 rpm
1/29/2016	HSC - 720	Dia: 20.0625 in
		Curve: 20MAD-F
		Impeller: C-3966A

Pumping Technology for Tomorrow's World
A Subsidiary of The Gorman-Rupp Company



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Company: Patterson Pump Company
Name:
1/29/2016

Patterson 60 Hz Pumps
Catalog: Patterson Pumps 60HZ, Vers 1.2
HSC - 720

Size: 24x20 MAD-F
Speed: 490 - 590 rpm
Dia: 20.0625 in
Curve: 20MAD-F
Impeller: C-3966A

Pumping Technology for Tomorrow's World
A Subsidiary of The Gorman-Rupp Company

Pump Data Sheet - Patterson 60 Hz Pumps

Company: Patterson Pump Company
Name:
Date: 1/29/2016

Pumping Technology for Tomorrow's World
A Subsidiary of The Gorman-Rupp Company

Pump:

Size: 24x20 MAD-F

Type: HSC
Synch speed: 720 rpm

Speed: 590 rpm
Dia: 20.0625 in

Curve: 20MAD-F

Impeller: C-3966A

Specific Speeds:

Ns: 3805
Nss: ---

Dimensions:

Suction: 24 in
Discharge: 20 in

Pump Limits:

Temperature: 200 °F
Pressure: 110 psi g
Sphere size: 2.5 in

Power: ---
Eye area: ---

Search Criteria:

Flow: 10000 US gpm

Head: 30 ft

Fluid:

Water
SG: 1
Viscosity: 0.9946 cP

Temperature: 68 °F
Vapor pressure: 0.3391 psi a
Atm pressure: 14.7 psi a

NPSHa: ---

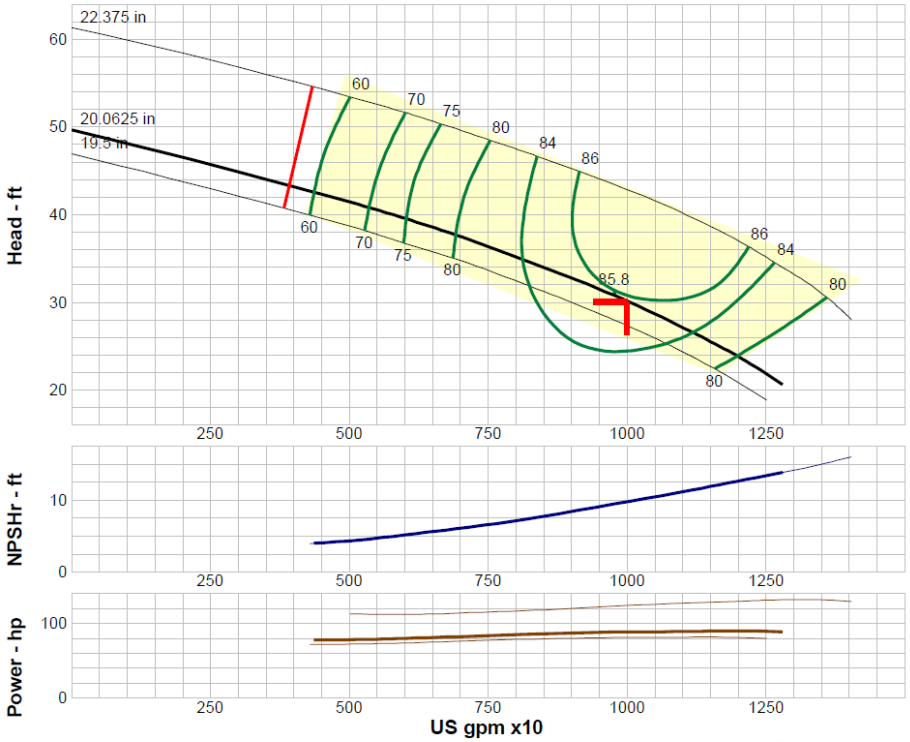
Motor:

Standard: ---
Enclosure: ---

Speed: ---
Frame: ---

Sizing criteria: Max Power on Design Curve

---- Data Point ----	
Flow:	10000 US gpm
Head:	30.1 ft
Eff:	85.5%
Power:	88.5 hp
NPSHr:	9.81 ft
---- Design Curve ----	
Shutoff head:	49.7 ft
Shutoff dP:	21.5 psi
Min flow:	3907 US gpm
BEP:	85.8% @ 9767 US gpm
NOL power:	90.2 hp @ 11973 US gpm
-- Max Curve --	
Max power:	131 hp @ 12651 US gpm



In accordance with the Hydraulic Institute Standards, pump is guaranteed for one set of conditions. Performance guarantees are based on shop test and when handling clear, cold, fresh water at sea level and at a temperature no greater than 85 degrees F. Suction lift must not exceed that shown on curve.

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
12000	590	23.8	79.8	90.1	12.7
10000	590	30.1	85.5	88.5	9.81
8000	590	35.1	83.6	84.8	7.19
6000	590	39.6	74.9	80	5.2
4000	590	43.1	56.4	77.8	3.82

PDI PUMP SELECTION 10.6.0.0

Selected from catalog: Patterson Pumps 60HZ Vers: 1.2

Appendix C -- Existing Drought Plan

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
SANTA FE

John R. D'Antonio, Jr., P.E.
State Engineer

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MEMORANDUM

DATE: August 1, 2008
FROM: John D'Antonio, State Engineer, Chair, Governor's Drought Task Force
TO: Governor Bill Richardson

RE: **RECOMMENDATIONS FROM THE DTF**

On behalf of the Governor's Drought Task Force (DTF), I would like to thank you for issuing Executive Order 2008-037 (EO) on July 14th. Pursuant to item 4 in the EO, the Drought Task Force (DTF) met immediately on July 18th to consider any revisions to the New Mexico Drought Plan and to prepare recommendations concerning steps that the State may take to conserve water during this period of extreme drought.

Current Status

The State of New Mexico still suffers extreme quantity water-related conditions; parts of the state are suffering from extreme drought. The DTF is looking carefully into how New Mexico can better manage and prepare for such extreme climate conditions and is pleased to provide the following recommendations.

Page 1 of 18

Recommended Actions:

1. **Critical Actions -**
   Continue to work with the United States Department of Agriculture Farm Service Agency and the New Mexico Department of Agriculture to follow through with the drought declaration process in order to facilitate the release of federal assistance to farmers and ranchers in our state.

2. **Ongoing Measures –**

   The Task Force has been and is continuing to work cooperatively to ensure that areas affected by drought have the necessary assistance. This effort has been ongoing over the past four years, but began to take focus as a result of your implementation of the 2005 House Joint Memorial 86. That effort instructed the Office of the State Engineer and the New Mexico Environment Department (NMED) to work with other agencies to develop criteria for water system planning, performance and conservation as a condition of state financing. This effort has culminated in Executive Order 2007-50 which, amongst other direction, established the Water Cabinet and the Water and Wastewater Infrastructure Development Division at NMED. These efforts have lead to the development of water and wastewater infrastructure evaluation plan, a uniform application implementation plan, and recommendations for efficient and effective use of water and wastewater funds. EO 2007-50 also requested the collaborations of the Department of Finance and Administration and the New Mexico Finance Authority. The coordination between these agencies provides drinking water suppliers in need with one-stop-shop opportunities to obtain capital funding. These efforts are ongoing and will continue.

   Below are the highlights of recommendations from each of the Drought Task Force member agencies. The full recommendations of each agency are also attached for your perusal.

OFFICE OF THE STATE ENGINEER

- Support ongoing water development planning efforts mandated by HM 42 from the 2007 Legislative Session
- Provide technical assistance (leak detection & audit training programs) to encourage use of the best available conservation technologies. To date the OSE has worked with Ruidoso, Rio Rancho, Gallup and Las Vegas to identify over 600 million gallons/year of water leaking from those systems.
- Continue to promote best practices in local communities to achieve benchmarks and conservation goals
- Continue to develop new partnerships with public and private entities throughout the state to promote water conservation

- Continue to expand water conservation education and outreach programs in our schools and with the general public
- Lead efforts to create guidelines for more efficient use of water (gpcd methodology)

INTERSTATE STREAM COMMISSION

- Maintain the effort to keep the Elephant Butte Pilot Channel open
- Continue the operation of the Water Management Decision Support System for Middle Rio Grande Conservancy District
- Support the following:
    - San Juan River Administration Agreements
    - Regional Water Planning
    - Acequia Rehabilitation Programs
    - Metering Re-loan Program
    - Middle Rio Grande ESA River Operations Optimization

NEW MEXICO DEPARTMENT OF AGRICULTURE

Continue coordination effort to ensure appropriate information is transmitted to US Department of Agriculture. Other activities include developing systems to assist producers in anticipating drought conditions and planning appropriate plantings, operations and other activities.

TOURISM DEPARTMENT

- The Tourism Department will strive to make all visitors and local residents aware of New Mexico's many recreational opportunities and any potential restrictions to those opportunities; educate the media on the negative consequences "sensational" news reporting can have on the tourism industry; and continue its partnership with State Parks and the State Engineer's Office on an annual press conference each spring to update residents and tourists on possible impacts to the summer tourism season.

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

- NMEMNRD will continue the Governor's Green Power Purchase initiatives, electrical production from installed wind turbines and other similar programs. These renewable energy and efficiency projects are saving 3,400 acre-ft per year.

- Diversify programming. To counter the negative impacts the drought has on State Parks Division revenue - which have been significant - SPD has been expanding and diversifying recreational opportunities, programming, events, etc. that might appeal to visitors in spite of drought conditions. All landscaping, new building and retrofitting projects use best water conservation technology.

- Pre-positioned resources. The Forestry Division prepositions fire suppression resources in areas of the state to provide for fast response times to wildland fires. The pre-positioning helps keep new fires small and less costly when compared to large catastrophic fires that threaten or burn into communities.

- Community wildfire protection planning. The Forestry Division is working with many communities at risk from wildfire to develop Community Wildfire Protection Plans.

NEW MEXICO FINANCE AUTHORITY

- The New Mexico Finance Authority (NMFA) has provided effective financial and administrative support to combat the on-going drought in New Mexico. NMFA has several programs which can be applied to assist in the drought relief efforts

DEPARTMENT OF FINANCE AND ADMINISTRAION

- DFA is exploring the potential of requiring all entities that are seeking capital funds for the construction or improvement of wastewater treatment plants to evaluate the potential of dedicating produced wastewater to reuse on golf courses or other appropriate areas.

NEW MEXICO ENVIRONMENT DEPARTMENT

- The Environment Department has been working diligently on creating the Water and Wastewater Infrastructure Development Division.

3. Potential New Initiatives

In addition to these ongoing activities, we recommend further study of the following new potential activities for your consideration:

- Review the potential for creation of water conservation tax incentives
- Creation of a state sponsored "Living with Drought" web site
- Report water use savings that are monitored at a local level and share successes statewide
- Provide further suggestions for funding and implementing conservation programs that can provide measurable results

CURRENT and ONGOING STATE AGENCY DROUGHT MITIGATION ACTIVITIES

THE FOLLOWING INFORMATION HAS BEEN PROVIDED BY THE SECRETARY OR DIRECTOR OF THE DEPARTMENT OR AGENCY. THIS INCLUDES INFORMATION THAT UPDATES THE 2006 RECOMMENDATIONS.

NM OFFICE OF THE STATE ENGINEER

Technical Assistance for Public Water Suppler

- Leading efforts on House Memorial 42, a review of the 72.1.9 NMSA on water development planning to hold water rights unused.
- Publication of *New Mexico Water Use by Categories 2005*
- Pilot tested draft methodology and spreadsheet for standardizing the calculations of gallons per capita per day in Santa Fe, Santa Fe County, Gallup, El Vadito and Albuquerque.
- Distributing draft modules for conducting water use accounting as recommended by the American Water Works Association
- Conducting commercial audits for the food service industry through grant from the Bureau of Reclamation

Partnerships

- Worked with the NM Water Conservation Alliance and various sponsors to conduct "Save Every Drop: NM Landscape Training," that included certification opportunities and continuing education credits for professional landscapers, irrigators and landscape architects.
- Became a state partner of the Environmental Protection Agency's Water Sense program that develops specification for water efficient appliances, fixtures and irrigation equipment along with providing promotional materials.
- Produced *Irrigation Maintenance 101* DVD with the City of Santa Fe and Santa Fe Community College. DVD details operation of a commercial grade irrigation system.

Education and Outreach

- Provide kindergarten through high school curriculum on NM water issues and water conservation, distribution of over 85,000 pieces last year.
- Publication in November 2007 of *Discover the Waters of New Mexico*, developing in conjunction with Project WET, an award-winning international non-profit focused on water education. The publication provides a complete picture of New Mexico's water to NM's 8 to 12 year olds.
- Publication of *Roof-Reliant Landscaping: Rainwater Harvesting with Cistern Systems in New Mexico* is scheduled for August 2008
- Received grant from the Bureau of Reclamation to develop a DVD series on how to water New Mexico Landscapes, scheduled for completion summer 2009.

- Also coming in Summer 2009: statewide searchable plant list for xeriscapes and landscape irrigation calculator
- Lead efforts in planning implementation, sponsorships and/or presentations for various workshops, conferences, and festivals, including NM Rural Water Conference, Albuquerque Green Practices, Environmental Health and various County extensions and children's water festivals

INTERSTATE STREAM COMMISSION

Elephant Butte Pilot Channel – The dredging of the pilot channel through the sediment delta left behind at the upstream end of Elephant Butte Reservoir as the water level has receded in the recent drought years prevents the spreading and evaporation of the water on the delta. The pilot channel has been estimated to save between 10-20,000 acre-feet of water per year. This is roughly equivalent to one to two times the amount of water consumed by the City of Santa Fe annually.

Water Management Decision Support System for Middle Rio Grande Conservancy District – ISC staff working with MRGCD have developed an irrigation routing model that optimizes water use within the District. This type of work coupled with state and federally funded infrastructure improvements is credited with reducing diversions from a historical average of about 600,000 acre-feet/yr to about 325,000 acre-feet in 2004. Collaborative efforts between ISC and MRGCD continue to improve efficiencies.

San Juan River Administration Agreements - ISC staff has facilitated annual agreements for San Juan River administration and operations among the major agricultural, municipal and industrial water users on the river, which agreements include provisions for sharing of any water supply shortages between water users and habitat maintenance flows for endangered fish species. Such an agreement is in place for 2008.

Water Planning – The 16 regional water plans accepted by the ISC were required to include drought emergency contingency plans. In addition, the 2003 State Water Plan set "promoting drought planning" as a common goal and included implementation strategies related to drought planning, the Drought Task Force, and shortage sharing agreements.

Acequia Rehabilitation Programs – The ISC has several programs (in collaboration with the US Army Corps of Engineers and the Natural Resource Conservation Service) for rehabilitation and improvement of efficiency of acequia systems around the state. Many such rehabilitation projects include lining or piping of the acequias, which conserves significant quantities of water.

Re-loan Program – Under this program, irrigation, conservancy and soil and water conservation districts are able to borrow low interest money from the ISC's Irrigation Works Construction Fund to re-loan to their individual members for installation of irrigation efficiency measures that do not increase overall water consumption.

Metering Re-loan Program – Beginning in July 2006, additional re-loan funds were made available specifically for meters and metering equipment. These funds will be prioritized for use where the State Engineer has issued metering orders. The simple fact of installing meters and farmers being aware of their uses has been credited with changing use habits and conserving large quantities of water in the Pecos River Artesian Conservancy District.

San Juan Mountains Snowpack Augmentation - The ISC in 2007 entered into a five-year agreement with the Colorado Water Conservation Board to support winter cloud seeding activities in the San Juan Mountains in southwestern Colorado for the purpose of augmenting stream flows in the San Juan River stream system in Colorado and New Mexico. Pursuant to an amendment to the agreement, the ISC provided cost-share funding for seeding activities during the winter of 2007-2008.

Middle Rio Grande ESA River Operations Optimization – ISC staff have been reviewing river operations options that will help minimize conflicts among irrigators while still meeting the water needs of the endangered silvery minnow. This is being done in coordination with the appropriate federal agencies. In addition, the Commission has authorized expenditure of several hundred thousand dollars to support the optimization of river operations over the last several years.

NEW MEXICO DEPARTMENT OF AGRICULTURE

- Staff has been working with the United States Department of Agriculture Farm Service Agency to better communicate county damage reports/flash reports from FSA County Committees. These reports are integral to the drought declaration process and the release of federal assistance to farmers in our state. The department will coordinate with the Governor's office in sending a letter to the U.S. Secretary of Agriculture requesting drought declarations whenever the need arises.

- NMDA staff supports water conservation outreach initiatives be implemented through Cooperative Extension Service personnel.

- NMDA staff continues to participate with the Drought Monitoring Workgroup and provide agricultural indicators of drought conditions. Conditions such as soil moisture and range/pasture conditions are reported weekly by USDA National Agricultural Statistics Service (NASS). NMDA staff analysis this information and includes it in the New Mexico Drought Status Report throughout the growing season.

- NMDA staff has worked with scientist from the Climate Assessment for the Southwest (CLIMAS) as they expand AgClimate, the web-based decision support system, into New Mexico. This system provides risk assessment information based on historical temperature and precipitation associated with El Nino Southern Oscillation (ENSO) cycles. The system will also provide optimal growing schedules, chill accumulation risk assessments. Growing degree days, and also links with the pecan irrigation scheduling assistant. Many more features will become available to agricultural producers, as the

product is refined. In 2008 a workshop was held with county Extension personnel and local producers to inform them of the capability and to instruct them on the use of this system.

- NMDA staff performs bi-weekly reviews of the National Drought Mitigation Center's Vegetation Drought response Index (VegDRI). These maps are produced through calculation of integrated satellite observations of vegetation conditions, climate data, land cover, land use, soil characteristics, and ecological setting. They categorize drought conditions using ten-scale indicators ranging from extreme drought to extremely moist. This product was released in New Mexico in 2007 and the developers use stakeholder feedback as an indication for any needed adjustments.

TOURISM DEPARTMENT

NMTD has redesigned and brought the management of its web site, www.newmexico.org, in-house, in order to:
---Respond more quickly to questions regarding recreational opportunities, fire dangers, potential closings and upcoming events updated throughout the summer.
---Now offer a "live chat" with Department employees in New Mexico; and
---Provide links to sister state and federal agencies in New Mexico offering more in-depth information.

NMTD, State Parks, and the State Engineer's Office continue to work together to stage an annual press conference each spring in Albuquerque to forewarn residents and tourists about the impact the drought may have on the summer season and to plan accordingly. NMTD and State Parks also use the opportunity to encourage local residents to avail themselves of in-state recreational opportunities. NMTD continues to address concerns with media coverage on the negative impact "sensational" news reporting can have on the $5 billion tourism industry. Undue fears cause real harm to businesses. In many cases the greatest threat is not the natural disaster, but the public opinion created by imprecise or sensational news coverage.

Staff at NMTD's nine visitor information centers and at the Department's main office in Santa Fe will make all visitors aware of New Mexico's recreational conditions, including restrictions, closures, etc. through conversation and handouts. The handouts will include instructions on controlling campfires in those areas where they are permitted.

With the help of its industry partners, NMTD has developed a consistent message regarding New Mexico visitation and recreation that addresses weather conditions, drought and other potentially negative factors that could impact the industry if ignored. NMTD's communications officer works with the industry and other state agencies to maintain this message.

NMTD encourages sister agencies to incorporate language in their press releases that is "reader friendly," and that the releases are in a language the average citizen will understand. Above all, note any activities or events impacted by the news in the release, as well as those a citizen might suspect could be impacted but are not. If activities or events are restricted or cancelled due to the

situation, conspicuously note the nearest safe alternative location or other unaffected events in the region.

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

Energy Conservation and Management Division (Contact: Fernando Martinez)

Governor's Green Power Purchase initiative of June 17, 2004. State agencies are making green power purchases of approximately 65 million kWh of electricity in FY09 (up from 8,239,697 in 2006), primarily from wind energy sources.. These purchases will save 48 million gallons, (up from 6 million gallons in 06), which is a savings of 147 acre-feet of water at the power plant. It is planned to increase green power purchases by state agencies to 130 million kWh in FY11, which is projected to save 96 million gallons (294 acre-feet) of power plant water consumption annually.

Electrical production of installed wind turbines. Estimated production is 1.439 billion kWh per year, up from 830 million kWhs per year in '06. Water savings are 1.064 billion gallons, which is a savings of 3,265 acre-ft. per year at the power plant, (up from 614.2 million gallons in '06).

Clean Energy Grants. Electrical savings for projects that have been completed are nearly 1 million kWh per year and 0.7 million gallons (2.2 acre-ft) per year at the power plant.

Total water savings. Total savings from ECMD-supported renewable energy and efficiency projects are approximately 1.11 billion gallons (up from 912.8 million gallons in '06), which is a savings of 3,400 acre-ft per year, enough water for 13,600 people in the arid southwest U.S.

Requiring all new fossil fuel or nuclear electric thermal power plants to be dry-cooled or at least employ hybrid cooling would save water. Power plants in NM consume (not just use) in excess of 55,000 AFY – roughly the consumptive use of ABQ. Don't place this additional cost burden on solar thermal electric power plants for the first 5-8 years while the technology matures and costs come down. Then have it apply to all. Retrofitting existing power plants with dry or hybrid cooling should not be ruled out.

A drought "PIK" program should be considered where farmers growing water consumptive but low value crops (e.g. alfalfa) are paid to not grow/irrigate).

State Parks Division (Contact: Dave Simon)

SPD has a Drought Response Action Plan (DRAP), developed in 2003, which we have in force and implement as appropriate. Some of the measures in the DRAP that we are implement include:

Rehabilitation and new construction. "Green" building approaches conserve energy, water and natural resources. Projects are underway at several parks to replace roof and HVAC systems with

more energy- and water-efficient technology. For example, all showers at State Parks are on timers to insure that there is no possibility of wasting water.

Public Education. With additional educational/interpretive materials on drought conditions and responses that all citizens can have to these conditions, we could do much more substantive drought education with our partnership with PED and the Parks No Child Left Inside program.

Xeriscaping. SPD hired a licensed landscape architect who has been preparing and implementing professional xeriscape and landscaping plans for state parks. This work continues with every project that we have in state parks.

Marina relocations. To preserve visitor services, SPD concessionaires are prepared to relocate several marinas to the deepest water available on state park lakes if significant drops occur.

Fire season assistance. SPD continues to offer state parks for pre-positioning fire fighting equipment if appropriate. In addition, Forestry and State Parks are preparing SPD staff for fire prevention education, fire response administrative assistance, and actual firefighting as circumstances arise.

Diversify programming. To counter the negative impacts the drought has on SPD revenue - which have been significant - SPD has been expanding and diversifying recreational opportunities, programming, events, etc. that might appeal to visitors in spite of drought conditions. For example, SPD is purchasing a large stage to support events in the parks as well as a large outdoor movie screen to offer an alternative type of evening activity in the parks.

State Forestry Division (Contact: Arthur "Butch" Blazer)

Harvest regulations compliance. The Forestry Division is ensuring that industry is complying with forest harvest regulations to ensure water quality standards are met.

Forest and Watershed Health Plan. EMNRD is protecting water quantity and quality through collaboration with state and federal agencies and local units of government and communities on projects such as: forest thinning, the development of community wildfire protection plans, and the delivery of good science to private and public landowners for restoration and monitoring of watersheds.

Implement fire restrictions. Forestry has implemented fire restrictions in areas of the state where there are occurrences of human-caused fires and where high fire danger exists. The Division also conducts other fire prevention activities, such as Smokey Bear presentations and a media blitz for Wildfire Awareness Week.

Pre-positioned resources. The Division prepositions fire suppression resources in areas of the state to provide for fast response times to wildland fires. The pre-positioning helps keep new fires small and less costly when compared to large catastrophic fires that threaten or burn into communities.

Interagency season planning and training. Forestry works all year to develop initial attack plans and legal agreements with federal, state and local partners to ensure a fast and safe response to wildland fires in all jurisdictions in New
Mexico. The Division also provides basic and advanced training to more than 500 paid and volunteer local government firefighters each year.

Community wildfire protection planning. The Division is working with many communities at risk from wildfire to develop Community Wildfire Protection Plans. These plans identify areas at risk in the communities, as well as set project and other priorities that mitigate the threat of wildfire, which is increased by drought.

Salt cedar interagency cooperation. Forestry has been working with interagency cooperators and private landowners to reduce the threat of wildfire and improve forest health in the Middle Rio Grande Bosque. Work with similar groups has also been occurring in all major New Mexico riparian ecosystems in the state.

Landowner management planning. The Division works with private landowners, who want to improve and protect their property's habitat by generating management plans. The plans outline recommendations on how to manage their forests for wildlife habitat, recreation, fire safety, forest health and protection from forest insect and disease epidemics, all of which are affected by drought.

Youth Conservation Corps (Contact: Wendy Kent)

The YCC program funds many projects that have improved New Mexico's natural resources that have an impact on drought conditions.

Corps members have been involved in thinning projects on at least 7 USFS Ranger Districts, the Bosque and City Parks. The excessive vegetation has either been removed from the site or piled for burning or used to improve wildlife habitat. Not only does the removal of excessive vegetation reduce the use of water from this unwanted vegetation, it also helps to reduce fire danger and improve habitat diversity.

Many other projects have involved xeriscape installation at public facilities. Native or low water use plants and drip irrigation systems are being installed to replace landscapes that have plants or grass that use an extensive amount of water. Some of these projects also include water catchments systems.

Some of our other projects involve the installation of erosion control structures to reduce water runoff, stream bank deterioration and silting of New Mexico's streams and rivers.

Every one of these projects involve an educational component that provides information and hands on experience to the Corps members regarding watershed health, water use reduction, fire

prevention, xeri plants, drip irrigation, soil and water conservation and many other environmental principles that help New Mexico's young people become "conservationists."

Mining and Minerals Division (Contact: Bill Brancard)

Mine reclamation. MMD requirements reduce contamination of ground water and surface water supplies. Areas disturbed by mining are re-graded, covered and re-vegetated to prevent erosion and leaching of contaminants.

Abandoned coal mines. Sites have been reclaimed where mine waste piles are eroding into, and degrading, watercourses. Recent examples include reclamation of historic coal mine waste piles in Sugarite and Yankee Canyons near Raton.

Flexible reclamation standards. During droughts, companies are allowed to demonstrate success in non-consecutive years to meet regulatory standards.

Oil Conservation Division (Contact: Mark Fesmire)

Additional rules. OCD promulgates and enforces rules specifically designed to protect groundwater and surface water supplies.

Compliance and enforcement. Rules are designed to minimize pollution and punish offenders:

Surface waste management rules prevent salt and hydrocarbon contamination of surface and ground water.

Pit rules encourage safer handling of waste and contaminants to protect water supplies.

Produced water. OCD supports efforts to use produced water by:

Issuing discharge permits for experimental treatment projects that produce useable and environmentally safe water from oil production wastes.

Drafting rules to facilitate the use of produced water in applications that re-place fresh water.
Secondary recovery. OCD supports environmentally sound recovery and carbon sequestration projects, including permitting and participating in pilot projects using CO2 for secondary oil recovery and coal bed methane secondary recovery.

NEW MEXICO FINANCE AUTHORITY

The New Mexico Finance Authority (NMFA) has provided effective financial and administrative support to combat the on-going drought in New Mexico. NMFA has several programs which can be applied to assist in the drought relief efforts:

The Public Project Revolving Loan Fund (PPRF)

- Interest rates are based on insured bond market rates
- Up to $200,000 in disadvantaged entity funding at 0% & 3% interest rates are available based on the entities Median Household Income (MHI)
- Costs of Issuance, up to $200,000 per fiscal year, may be paid by the NMFA
- Can close on the loan as soon as 60 days after NMFA Board approval
- Since 2004, the NMFA has closed on 26 water and wastewater projects totaling $233,798,220
- Can fund projects under $1 million without specific Legislative Authorization
- May give special consideration to projects that are:
    - Affected by the drought
    - Exhibit water conservation practices
    - Maximize the re-use of water
    - Have innovative solutions to the drought
    - Regionalizing water systems
    - Rebuilding and improving acequia's
    - Exemplifying the efficient storage of water
    - Focused on fire suppression

Local Government Planning Fund:

- Provides upfront capital necessary to allow for proper planning of vital water and wastewater projects which include:
- Feasibility reports
- Preliminary engineering reports
- Master plans
- Conservation plans
- Economic development plans

Statute requires that the entity repay the grant if funding for the project is received. If the entity finances the project through the NMFA, the grant will be forgiven. Since 2004, the NMFA has closed on 47 projects totaling $ 1,047,709. Documents must be submitted by the consulting engineers and approved by the NMFA prior to disbursement of funds.

Water Trust Board (WTB)

The NMFA administers the WTB. The WTB provides funding for water storage, conveyance & delivery, watershed restoration and management, water conservation measures, flood prevention and Endangered Species projects. The WTB is a one year process that requires Legislative Authorization. Since 2003, the NMFA has closed 48 WTB projects totaling $45,170,559.

Drinking Water Revolving Loan Fund (DWRLF)

The DWRLF provides low-cost financial assistance for construction and improvements to drinking water facilities. If the project qualifies for a categorical exclusion, the project can close in approximately 6 months. The categorical exclusion is for a population of 10,000 or less and can be used for specific projects such as:

- Replacement of existing distribution lines within the same rights-of-way or easements
- Rehabilitation of existing equipment and structures.
- The construction of structures on existing sites
- Since 2004, the NMFA has closed 15 DWRLF projects totaling $55,345,392

Emergency Drought Relief (EDR)
The EDR was created in 2002 by Executive Order by the Office of the Governor. Thirteen projects totaling $2,241,973 were funded pursuant to the Disaster Relief Act, (NMSA 1978).

The WTB created a sub-committee which reviewed each project and recommended approval to the WTB.

The NMFA administered the program and the financing associated with all EDR projects.

The NMFA also staffed the Drought Hotline that was put in place by the WTB.

PLEASE FIND THE 2006 RECOMMENDATIONS BELOW. THEY REMAIN APPLICABLE FOR THE 2008 REPORT.

NEW MEXICO ENVIRONMENT DEPARTMENT

Drinking Water Bureau
The Capacity Development Program works to build financial, managerial and technical capacity at public water systems so they are capable of developing sustainable infrastructure, develop realistic rates to deal with future capital and operations and maintenance costs, and emergencies.

Source Water Protection and Wellhead and Watershed Protection programs focus on preserving the quality of the water available to public water systems by evaluating the susceptibility of each system to various contaminants, such as nitrates in groundwater, that are used to develop individualized wellhead and watershed protection plans.

Emergency Coordination with the Department of Public Safety, the Department of Health through a Joint Powers Agreement, and local governments to coordinate aid for communities that suffer outages due to drought conditions or other problems. The Department works with DPS to coordinate water hauls and works with DOH to manage and control water borne illness outbreaks, and coordinates with the New Mexico Finance Authority when the Department declares emergency situations for water systems due to water outages. The Department investigates potential threats to public health and safety and recommends NMFA grant emergency funds to water systems address the situation.

The Department offers technical assistance and training through contractors, such as the New Mexico Rural Water Association, which is focused on operations and management and certified

water operator training, and the Rural Community Assistance Corporation, which is focused on technical assistance and training on financial and managerial issues.

Department staff also offers public water systems technical assistance and training on financial, managerial and technical issues internally.

Emergency Preparedness
Developing Comprehensive Performance Evaluations and Area-Wide Optimization Programs for surface water systems across the state.

NMED plays a support role during and after a drought emergency. In this capacity, NMED will assist the Department of Public Safety and the Department of Health in responding to emergencies. NMED staff will assist in surveillance and sampling efforts and provide technical information on human health and the environment as related to the drought, as appropriate.

Will cooperate with the National Guard to initiate measures for furnishing drinking water during situations in which the source of water has been contaminated (NMED has neither the equipment nor the expertise to actually provide water in an emergency). No person or agency shall provide emergency supplies of drinking water unless the supplies have been determined to be safe by the NMED Drinking Water Bureau.

Will provide sound scientific information regarding the quality of drinking water to other agencies and the public.

Will work to identify funding sources to aid in disaster relief for drinking water systems and provide advice on technical issues to drinking water suppliers.

Notify the public regarding the seriousness of the emergency and providing the public with appropriate procedures to minimize health risks from contaminated drinking water.

Construction Programs Bureau
Established a process to expedite loan applications for emergency funding.

Surface Water and Ground Water Quality Bureaus
GWQB and SWQB are sampling quarterly in the Lower Rio Grande to determine and track the effects of drought.

Based on a rotational schedule, NMED is intensively sampling the western half of the Canadian watershed, Valle Vidal, and the Dry Cimarron watersheds during 2006. Since we anticipate some of the streams we are monitoring in these areas may dry up, we are modifying our normal sampling plan slightly to be sure to monitor the bulk of parameters in the spring and early summer before the streams go dry.

GWQB and SWQB are enforcing Water Quality Control Commission regulations designed to protect ground water and surface water supplies.

NMED is encouraging reduction in waste generation and recycling of waste-water through its Pollution Prevention and Mining Environmental Compliance Programs, which in turn reduces the use of fresh water.

District Offices

Field staffs are educating citizens in their districts on the ramifications of wild fire and the impact it could have on available water supply, such as contaminated water supplies from ash flows and increased water demands for fire fighting uses.

Air Quality Bureau

Per state regulation, the AQB tracks and receives reports of controlled and wildfire burns throughout the state. State regulation also requires notification of the public for controlled burns. The reports can be mapped to determine areas that may be impacted by enough smoke to create unhealthy conditions for the public. In areas already inundated by smoke, prescribed burn permits will be denied. The AQB collaborates with federal agencies to issue press releases regarding wildfire and the levels of air pollution associated with these fires. Some sectors of the population are extremely sensitive to the pollutants emitted from wildfire and controlled burns, so it is important to provide information and forewarning regarding the expected and current air pollution levels within the state.

The AQB has equipment and expertise to monitor particulate matter from wildfires and controlled burns. The AQB often partners with federal land management agencies to monitor air pollution from controlled burns and wildfire.

Governor Richardson's climate change initiative will help to reduce greenhouse gasses that are responsible for increasing temperatures that exacerbate the effects of drought in the Southwest. Scientists tell us that increasing temperatures due to global warming cause reduced snowpack, earlier and quicker spring runoff, increased and more severe forest fires and increased evaporation from water bodies and soil.

DEPARTMENT OF INDIAN AFFAIRS

IAD continues to apprise and work with the State's 22 Nations, Tribes, and Pueblos regarding the ever-changing drought situation in New Mexico. IAD will continue to monitor local drought conditions in Indian country, particularly as they impact or relate to pending legislation or existing water projects within those areas. IAD continues to serve as a conduit of information to the Tribes for the Drought Task Force.

DEPARTMENT OF FINANCE AND ADMINISTRATION

Water Innovation Fund. The Department of Finance and Administration is working with local communities throughout the state to implement innovative water technology that will save water and demonstrate the successful use of these technologies. In FY05-06, more than $3.0 million was awarded to projects that are estimated to save 1.67 billion gallons of water. Another $3.0

million was appropriated in the 2006 session. The Department of Finance and Administration will work to ensure that these funds are awarded in a timely manner to projects that will conserve water throughout the state.

Efficient Infrastructure for Colonias. The Department of Finance and Administration is working to distribute $5.0 million that was allocated in the 2006 Session for infrastructure improvements at colonias. The Agency is also attempting to leverage these funds with federal USDA dollars for infrastructure improvements. More efficient water and wastewater systems will conserve water supplies and protect the quality of water resources.

Support Local Government Water and Wastewater Projects. The Local Government Division at the Department of Finance is responsible for distributing funding for many local water and waste water projects, including a group of projects selected as examples of implementing new technologies in a scope and scale that demonstrates the viability of the technology. More than $22.5 million was appropriate for these strategic projects, as well as significant funding for local water and wastewater projects.

Support Water System Regionalization. The Department of Finance and Administration is working closely with the New Mexico Environment Department to promote water system regionalization projects. The Governor requested $10.0 million for this purpose and the 2006 Legislature appropriated $3.0 million. Water system regionalization, in most cases, will increase overall system efficiency and lead to water savings. The Department of Finance and Administration will work to ensure that these funds are distributed in a timely manner.

ECONOMIC DEVELOPMENT DEPARTMENT

The Economic Development Department is working to better integrate water conservation with business development and recruitment.

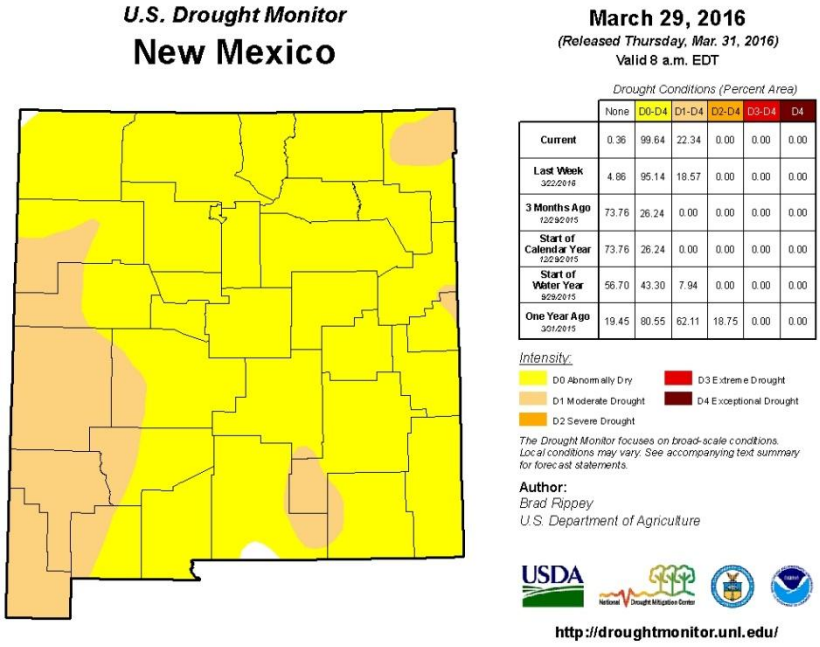
The Department is convening a working group of New Mexico business representatives and EDD staff to consider ways New Mexico could encourage conservation by existing business and facilitate the recruitment and expansion of water efficient industries. The group will examine ways that state incentives could be modified to encourage water conservation. It will also identify aspects of New Mexico's tax code -- such as the preferential tax treatment of sprinklers relative to drip systems – that may actually work to *discourage* water conservation. Finally, the group will examine financing mechanisms such as a bonding fund for water conservation retrofits and equipment capitalized with revenue generated by the cost savings attributable to those improvements.

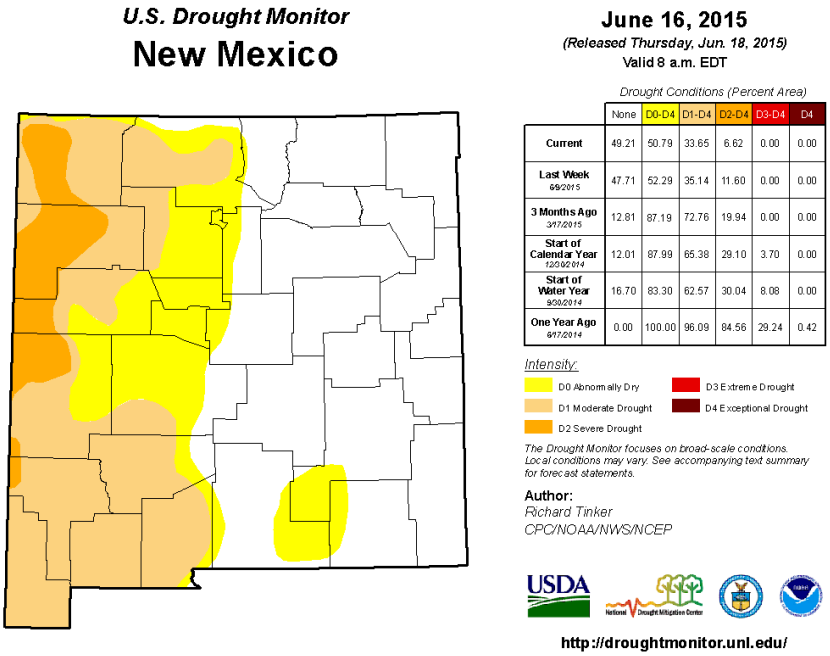
Participants in the group's first meeting agreed that the state should recognize businesses that were exceptionally innovative or conscientious in their use of water through an annual award to be presented by the Governor. To gain statewide, broad-spectrum support, the group suggested that regional awards be presented to both small and large businesses over the course of the year and that the annual Governor's award winner be chosen from among the year's regional winners.

Meeting participants agreed that conservation efforts by business would benefit from an Internet-based one-stop shop for state and local water conservation incentives. Users of such a site would input their geographic location and type of business and would be provided with a list of state and local incentives for which they might be eligible.

Appendix D -- Drought Graphs

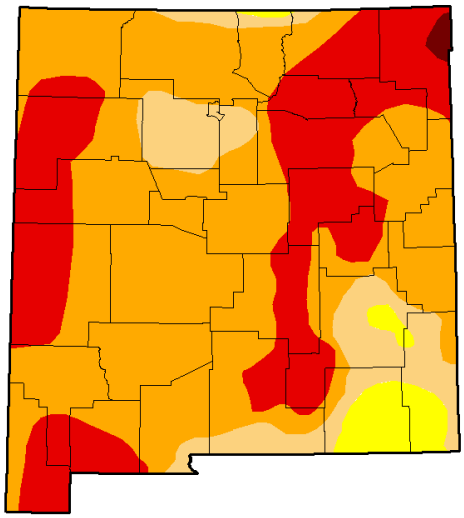
U.S. Drought Monitor: New Mexico Six Year Period





U.S. Drought Monitor

New Mexico



June 17, 2014

(Released Thursday, Jun. 19, 2014)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	96.09	84.56	29.24	0.42
Last Week 6/10/2014	0.00	100.00	95.57	84.54	29.24	0.42
3 Months Ago 3/18/2014	0.49	99.51	95.60	64.87	23.44	0.00
Start of Calendar Year 12/31/2013	0.39	99.61	75.21	32.68	3.96	0.00
Start of Water Year 10/1/2013	1.66	98.34	74.92	37.81	3.39	0.00
One Year Ago 6/18/2013	0.00	100.00	100.00	98.49	90.18	44.13

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

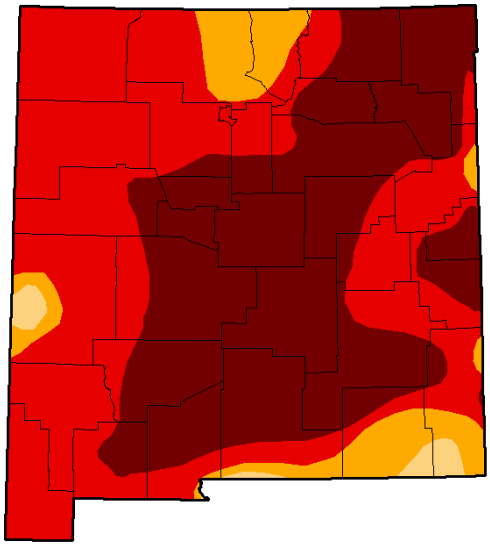
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Eric Luebehusen
U.S. Department of Agriculture

http://droughtmonitor.unl.edu/

U.S. Drought Monitor

New Mexico



June 18, 2013

(Released Thursday, Jun. 20, 2013)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	98.49	90.18	44.13
Last Week 6/11/2013	0.00	100.00	100.00	98.72	82.10	44.70
3 Months Ago 3/19/2013	0.23	99.77	98.47	89.85	49.95	4.25
Start of Calendar Year 1/1/2013	0.00	100.00	98.83	94.05	31.88	0.97
Start of Water Year 9/25/2012	0.00	100.00	100.00	62.56	12.25	0.66
One Year Ago 6/19/2012	0.00	100.00	99.64	81.29	25.17	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

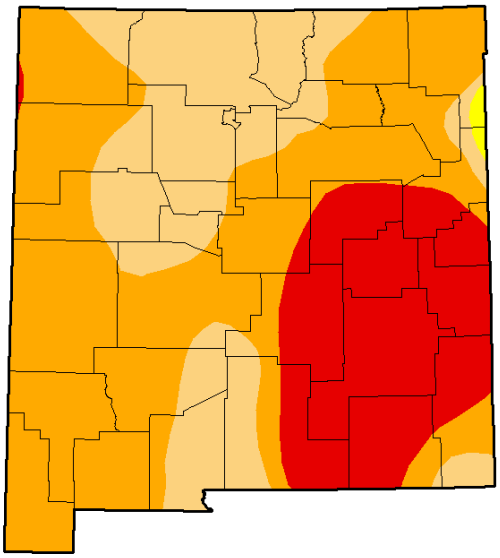
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Mark Svoboda
National Drought Mitigation Center

http://droughtmonitor.unl.edu/

U.S. Drought Monitor

New Mexico



June 12, 2012

(Released Thursday, Jun. 14, 2012)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	99.64	73.03	23.46	0.00
Last Week 6/5/2012	0.00	100.00	99.64	69.34	23.46	0.00
3 Months Ago 3/13/2012	11.31	88.69	81.79	60.06	24.94	9.13
Start of Calendar Year 1/3/2012	8.63	91.37	87.60	72.13	23.37	7.57
Start of Water Year 9/27/2011	0.00	100.00	96.40	88.99	69.61	35.13
One Year Ago 6/14/2011	0.75	99.25	93.98	87.35	67.86	44.90

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

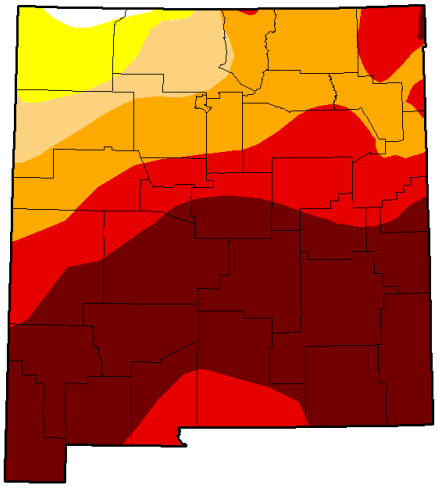
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
David Miskus
NOAA/NWS/NCEP/CPC

http://droughtmonitor.unl.edu/

U.S. Drought Monitor

New Mexico



June 14, 2011

(Released Thursday, Jun. 16, 2011)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.75	99.25	93.98	87.35	67.86	44.90
Last Week 6/7/2011	0.75	99.25	93.98	87.35	67.91	44.53
3 Months Ago 3/15/2011	7.79	92.21	84.02	33.82	9.25	0.00
Start of Calendar Year 1/4/2011	6.34	93.66	40.44	0.00	0.00	0.00
Start of Water Year 9/28/2010	76.66	23.34	0.00	0.00	0.00	0.00
One Year Ago 6/15/2010	50.60	49.40	17.27	0.00	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

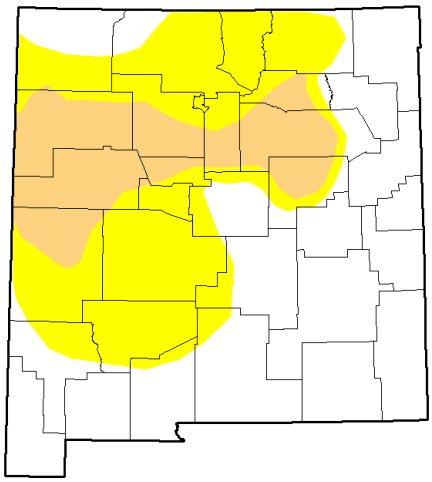
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Brian Fuchs
National Drought Mitigation Center

http://droughtmonitor.unl.edu/

U.S. Drought Monitor

New Mexico



June 15, 2010

(Released Thursday, Jun. 17, 2010)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	50.60	49.40	17.27	0.00	0.00	0.00
Last Week 6/8/2010	81.91	18.09	0.02	0.00	0.00	0.00
3 Months Ago 3/16/2010	76.26	23.74	0.00	0.00	0.00	0.00
Start of Calendar Year 12/29/2009	56.91	43.09	10.11	2.26	0.00	0.00
Start of Water Year 9/29/2009	73.10	26.90	2.98	0.00	0.00	0.00
One Year Ago 6/16/2009	38.10	61.90	37.13	9.99	0.00	0.00

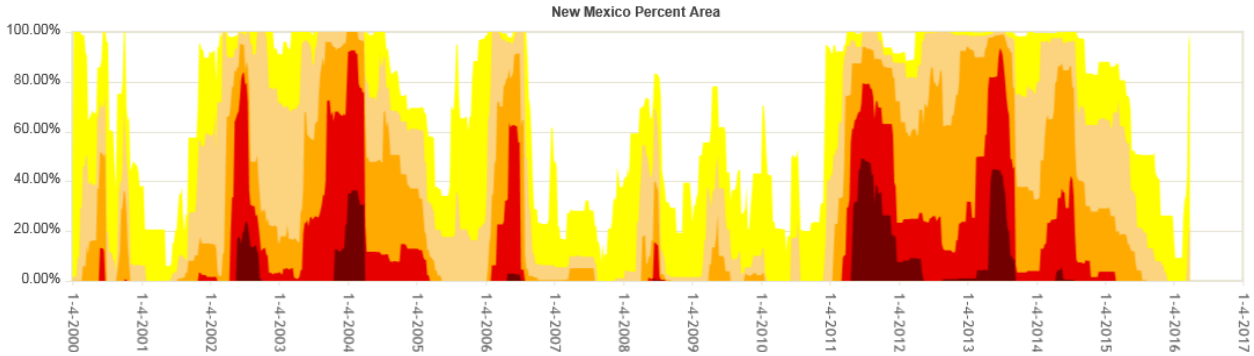
Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Mark Svoboda
National Drought Mitigation Center

http://droughtmonitor.unl.edu/



Appendix E -- Letters of Support

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority
2600 Prospect N.E., Albuquerque, NM 87107
Phone: (505) 884-2215 Fax: (505) 884-0214
Website: www.amafca.org

April 1, 2016

Dear Bureau of Reclamation:

Albuquerque Metropolitan Flood Control Authority (AMAFCA) fully supports the Middle Rio Grande Conservancy District's (DISTRICT) application for a Drought Resiliency Project Grant made available through the U.S. Bureau of Reclamation's WaterSMART Program. The DISTRICT has been a long-time partner with AMAFCA dealing with regional flooding issues and water quality concerns.

AMAFCA builds and maintains flood control structures and addresses stormwater quality to protect residents in the urban area and aquatic habitat in the Rio Grande. The drought resiliency project proposed by the DISTRICT is the type of project that will mitigate current issues and provide infrastructure for long-term resiliency to drought and climate change for the DISTRICT and its constituents that include a portion of AMAFCA's jurisdiction.

The installation of the Socorro Main Canal South Distribution Hub, a water measurement device that will enable precise rate of flow regulation for all lands south of the project as well as increase discharge of water to the Rio Grande to improve habitat for endangered species protection.

AMAFCA was created over 50 years ago to protect lives and property from flooding. While this is still our primary focus, we constantly evaluate how best to accomplish this. Our recent efforts have been directed at ways to slow down stormwater and think more holistically about the role stormwater plays in the management of all water resources in the region.

There are unique challenges facing AMAFCA and we are pleased the DISTRICT is undertaking this effort, as we are equally concerned about future water availability and system resiliency. AMAFCA's contribution towards the acquisition of the nation's first National Wildlife Refuge, Valle de Oro, in the western United States is part of a larger effort to provide flood protection for the urban area, but also to protect, restore and enhance important wetland, riparian and associated upland habitat needed to address storm water quality before runoff enters the Rio Grande.

April 1, 2016
Bureau of Reclamation
Letter of Support for the Middle Rio Grande Conservancy District application for Drought Resiliency Project Grant

If you have any questions or require additional information, please call me at (505) 884-2215.

Sincerely,
AMAFCA

Jerry M. Lovato, PE
Executive Engineer

CC: Mike Hamman, CEO MRGCD
Katie Babuska

CITY OF SOCORRO

Ravi Bhasker
Mayor

111 School of Mines Road
P.O. Box K
Socorro, NM 87801
Phone: (575) 835-0240
Fax: (575) 838-4027
www.socorronm.gov

March 29, 2016

Dear Bureau of Reclamation:

The City of Socorro is providing this letter of support for the Middle Rio Grande Conservancy District's (District) application for a Drought Resiliency Project Grant made available through the U.S. Bureau of Reclamation's WaterSMART Program. The MRGCD has been a long-time partner of the City of Socorro, working together on multiple projects including the Rio Grande Levee Reconstruction Project, the City's Waterline Replacement Project, the reconstruction of Socorro Ditch to make the area safe for students, cleaning culverts and providing safe walking routes within the City of Socorro.

The District is proposing the installation of the Socorro Main Canal South Distribution Hub, a water measurement device that will enable precise rate of flow regulation for all lands south of the project as well as increase discharge of water to the Rio Grande to improve habitat for endangered species protection. The project will increase the reliability of water supplies through infrastructure improvements, and provide protection for fish, wildlife and the environment. In addition, the project may result in water savings that enhance infrastructure resiliency to better manage extended periods of drought and help reduce the subsequent risk to fish and wildlife.

Completion of this project is crucial. The Middle Rio Grande (MRG) and New Mexico have experienced drought conditions resulting in below normal spring runoff periods and low summer river flows over the last decade, with a number of years at well below long-term averages. The resultant water shortages from long-term and persistent drought have created a number of intense challenges in the MRG in meeting the competing water management interests that include the demands of the riparian system from Cochiti Dam to Elephant Butte, meeting 60,000 acres of irrigation demands, assuring that Rio Grande Compact delivery requirements are met annually, and operating in a manner that keeps sufficient water within the river for environmental and endangered species purposes.

There are unique challenges facing the City of Socorro and we are pleased the District is undertaking this effort as we are equally concerned about future water availability and system resiliency. If you have questions or need additional information, please feel free to contact me at 505-480-6172 or rbhasker@socorronm.gov.

Sincerely,

Ravi Bhasker, Mayor
City of Socorro

Southern Sandoval County Arroyo Flood Control Authority

1041 Commercial Dr. S.E. • Rio Rancho, New Mexico 87124
(505) 892-RAIN (7246) • FAX (505) 892-7241

March 31, 2016

Dear Bureau of Reclamation:

The Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA) is providing this letter of support for the Middle Rio Grande Conservancy District's (District) application for a Drought Resiliency Project Grant made available through the U.S. Bureau of Reclamation's WaterSMART Program. The MRGCD has been a long-time partner of SSCAFCA, working together on management of water resources.

The District is proposing the installation of the Soccoro Main Canal South Distribution Hub, a water measurement device that will enable precise rate of flow regulation for all lands south of the project as well as increase discharge of water to the Rio Grande to improve habitat for endangered species protection. The project will increase the reliability of water supplies through infrastructure improvements, and provide protection for fish, wildlife and the environment. In addition, the project may result in water savings that enhance infrastructure resiliency to better manage extended periods of drought and help reduce the subsequent risk to fish and wildlife.

Completion of this project is crucial. The Middle Rio Grande (MRG) and New Mexico have experienced drought conditions resulting in below normal spring runoff periods and low summer river flows over the last decade, with a number of years at well below long-term averages. The resultant water shortages from long-term and persistent drought have created a number of intense challenges in the MRG in meeting the competing water management interests that include the demands of the riparian system from Cochiti Dam to Elephant Butte, meeting 60,000 acres of irrigation demands, assuring that Rio Grande Compact delivery requirements are met annually, and operating in a manner that keeps sufficient water within the river for environmental and endangered species purposes.

There are unique challenges facing SSCAFCA and we are pleased the District is undertaking this effort as we are equally concerned about future water availability and system resiliency.

If you have questions or need additional information, please contact me at 505-892-7246 or cthomas@sscafca.com.

Sincerely,

Charles Thomas, P.E.
Executive Engineer
SSCAFCA

Town of Bernalillo

"The City of Coronado"

March 30, 2016

Dear Bureau of Reclamation:

The Town of Bernalillo is providing this letter of support for the Middle Rio Grande Conservancy District's (District) application for a Drought Resiliency Project Grant made available through the U.S. Bureau of Reclamation's WaterSMART Program. The MRGCD has been a long-time partner of Town of Bernalillo, working together on local acequia issues including stormwater management.

The District is proposing the installation of the Soccoro Main Canal South Distribution Hub, a water measurement device that will enable precise rate of flow regulation for all lands south of the project as well as increase discharge of water to the Rio Grande to improve habitat for endangered species protection. The project will increase the reliability of water supplies through infrastructure improvements, and provide protection for fish, wildlife and the environment. In addition, the project may result in water savings that enhance infrastructure resiliency to better manage extended periods of drought and help reduce the subsequent risk to fish and wildlife.

Completion of this project is crucial. The Middle Rio Grande (MRG) and New Mexico have experienced drought conditions resulting in below normal spring runoff periods and low summer river flows over the last decade, with a number of years at well below long-term averages. The resultant water shortages from long-term and persistent drought have created a number of intense challenges in the MRG in meeting the competing water management interests that include the demands of the riparian system from Cochiti Dam to Elephant Butte, meeting 60,000 acres of irrigation demands, assuring that Rio Grande Compact delivery requirements are met annually, and operating in a manner that keeps sufficient water within the river for environmental and endangered species purposes.

There are unique challenges facing the Town of Bernalillo and we are pleased the District is undertaking this effort as we are equally concerned about future water availability and system resiliency. If you have questions or need additional information, please contact me at 505-867-3311 or mayortorres@townofbernalillo.org.

Sincerely,

Jack Torres, Mayor
Town of Bernalillo

P.O. Box 638 829 Camino del Pueblo Bernalillo, NM 87004 (505) 867-3311 *FAX (505) 867-0481

Audubon NEWMEXICO

P.O. Box 9314
Santa Fe, NM 87504-9314
Tel: 505-983-4609
Fax: 505-983-2355
http://nm.audubon.org

April 7, 2016

BOR WaterSMART Drought Resiliency Planning

Dear Bureau of Reclamation:

Audubon New Mexico (Audubon) is providing this letter of support for the Middle Rio Grande Conservancy District's (District) application for a Drought Resiliency Planning Grant made available through the U.S. Bureau of Reclamation's WaterSMART Program. Audubon and MRGCD have recently been partnering on the delivery of environmental water for the benefit of habitat in the Middle Rio Grande (MRG).

The District is proposing the installation of the Soccoro Main Canal South Distribution Hub, a water measurement device that will enable precise rate of flow regulation for all lands south of the project as well as increase discharge of water to the Rio Grande to improve habitat for endangered species protection. The project will increase the reliability of water supplies through infrastructure improvements, and provide protection for fish, wildlife and the environment. In addition, the project may result in water savings that enhance infrastructure resiliency to better manage extended periods of drought and help reduce the subsequent risk to fish and wildlife.

Completion of this project is crucial. The MRG and New Mexico have experienced drought conditions resulting in below normal spring runoff periods and low summer river flows over the last decade, with a number of years at well below long-term averages. Water shortages from long-term and persistent drought have created a number of intense challenges in the MRG in meeting several, competing demands: the riparian system from Cochiti Dam to Elephant Butte; irrigation; assuring annual Rio Grande Compact deliveries; and operating in a manner that keeps sufficient water within the river for environmental and endangered species purposes.

Audubon is pleased the District is undertaking this effort as we are equally concerned about future water availability and system resiliency. If you have questions or need additional information, please contact Sharon Wirth at 505-492-1399 or swirth@audubon.org.

Sincerely,

Sharon Wirth

Freshwater Program Manager
Audubon New Mexico