TIER-1 APPLICATION TO THE NEW MEXICO INTERSTATE STREAM COMMSSION FOR NEW MEXICO UNIT OR WATER UTILIZATION ALTERNATIVE UNDER THE ARIZONA WATER SETTLEMENTS ACT

Applicant Information **Date:** April 29, 2011

1. Legal Name:
Grant County Water Commission
a. City of Bayard
b. Town of Hurley
c. Village of Santa Clara
d. Town of Silver City
e. County of Grant

2. Organization:
Joint Powers Agreement
Municipality
Municipality
Municipality
Municipality
County

3. Address
Grant County Water Commission
Attn: Alex C. Brown, Chair
PO Box 1188
Silver City, NM 88062

4. Name, email, and phone number of contact person
Alex C. Brown
tscmgr@qwestsoffice.net
(575) 534-6450

5. Type of Application (check one):
[ ] Final [X] Preliminary for Review [ ] Revised

6. Type of Applicant (Check Box):
[X] local governments or municipalities
[ ] soil and water conservation districts, irrigation districts or commissions, acequias, or other political subdivision of the State of New Mexico
[ ] institutions of higher education or a consortium of such institutions
[ ] non-profit organizations or associations
[ ] private individual/s
[ ] federal agency (ies)
[ ] other (specify)

7. Brief Project Description:
This joint application supports the formal development of a Regional Water Supply and Distribution System to meet existing and future demand for drinking water for the municipalities of Grant County and adjacent unincorporated areas.

Purpose
The project will immediately serve approximately 26,000 people by:

- providing reliable access to local public supplies of drinking water by improving existing (and building new) water diversion and distribution infrastructure,
- making new sources of water available to meet local demand for public supplies of drinking water,
- and conserving existing local public water supplies by re-using municipal effluent water.

Elements
A. (PRIORITY) Construct a new well field in the vicinity of the Grant County Airport to make:
a. (PRIORITY) 193.2 AFY of water rights stranded by the critical block system
available to Hurley.
b. 750 AFY of return flow credits generated by the Silver City wastewater treatment plant water available to Hurley, Bayard, Santa Clara, Silver City and points in between via a regional waterline. (Model example of effluent reuse in New Mexico)

(7 continued)

B. (PRIORITY) Develop new supporting infrastructure for community water systems that are supported by the regional distribution system:

a. (PRIORITY) Develop two new wells, refurbish one existing well, construct a new water storage tank, and construct a new transmission line linking wells and storage tank facilities in Bayard.

b. (PRIORITY) Immediately construct a waterline that links the Santa Clara water system with the Arenas Valley Water Association for water deliveries in emergency situations. (This linkage is a temporary bridging action until the regional waterline can be constructed.)

C. (PRIORITY) Develop reuse capacity for effluent water generated by the Bayard Regional Waste Water Treatment Plant..

D. Improve Frank's Well Field (In the Gila Basin):

a. Recharge the Frank's well field, (1,120.24 AFY currently) with water from the existing pipeline linking Bill Evans Lake to the Tyrone Mine. (One cubic foot per second of flow recharges approximately 750 AFY.)

b. Construct a new transmission line linking Frank's Well Field with a regional distribution system.

c. Construct a regional waterline that links Silver City, Santa Clara, Bayard, and Hurley with ample groundwater supplies in the western part of the project area and the eastern part. (These supplies lie in the geologic feature called the Mangas Trench, which is naturally recharged at rate of 16,000 AFY on average and which has approximately 15,000,000 AF in storage.) The purpose of using the eastern and the western portions of the
trench feature is to disperse and minimize overlapping cones of depression, resulting from municipal withdrawals.

(6 continued)

8. AREAS AFFECTED

Central Grant County, including the municipalities of Bayard, Hurley, Santa Clara, Silver City, and nearby unincorporated areas, including Tyrone, Pinos Altos, Arenas Valley, Ft. Bayard, Hanover and North Hurley.

9. TOTAL FUNDING REQUESTED (in $1,000): $33,920

2012 Element A $5,400 Element Ba $1,250 Element Bb $100	2013: Element C $4,500	2014: Element Da $4,340	2015:	2016: Element Db $4,330
2017:	2018: Element E $14,000	2019:	2020:	2021:

10. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLIANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED REQUIREMENTS AND ASSURANCES IF THE PROPOSAL IS ACCEPTED.

10. TYPED OR PRINTED NAME OF AUTHORIZED REPRESENTATIVE: Alex C. Brown	**11. TITLE:** Chairman, Grant County Water Commission Town Manager, Town of Silver City	**12. PHONE NUMBER:** (575) 534-6350
13. **SIGNATURE:** /s/ Alex C. Brown	**DATE:** April 29, 2011	

Project Proposal

This project would develop a regional water distribution system and new water sources to support that system. It will conserve existing well fields, mitigate the current concentrated effects of water withdrawal, increase public water supplies, and improve reliable access to public water.

This regional project has five major elements:

A. A new well field in the vicinity of Grant County Airport to support Hurley and neighboring communities with a new water source. (Mimbres Basin). Element A on the attached map.

   a. This project element would enable Hurley to access 193.2 acre-feet of water rights that Silver City holds in the vicinity of the Grant County Airport. A proposal with description, analysis, and cost estimate was developed by Balleau Groundwater, Inc. It is available upon request. Capital costs are currently estimated to be $5,400,000 and the annual operating and maintenance costs to be $460,000. An additional report was prepared by Balleau assessing the "*Hydrologic Effects of Wellfield use in Area of Grant County Airport. March 2011.*"

   b. The project element would also be located appropriately for the diversion of as much as an additional 750 AFY of water that the Silver City demonstrably returns to the Mimbres aquifer through its wastewater discharge to the San Vicente Arroyo. Balleau Groundwater, Inc has prepared a document assessing the magnitude and timing of the return-flow from the Silver City wastewater treatment plant. The document is titled "*Effluent Percolation into the Gila Group Aquifer near Silver City, New Mexico. November 2010.*" Based on this assessment the Town will apply to the Office of the State Engineer for return-flow credits. All of this water could be conveyed from the new well field via a new transmission line to Hurley, where it could enter a regional distribution system.

B. Improvements to local water diversion and distribution systems supported by the regional system. (Mimbres Basin) Element B on the attached map. This project element would allow improvements to local community water systems that are independently operated but supported by the larger, cooperative system of regional supply and distribution. These activities would include such things as:

   a. For Bayard, the development of two new wells, the refurbishment of existing wells, the construction of a water storage tank, and the

construction of a new transmission line linking wells and tanks. The estimated cost of these improvements is $1,250,000.

b. For Santa Clara, the development of system link between the village water system and that of the Arenas Valley Water for water deliveries in emergency situations. (This linkage is a temporary bridging action until a regional waterline can be constructed.) The estimated cost of this improvement is $100,000.

C. Effluent reuse in Bayard, and potentially in Santa Clara and Fort Bayard, to irrigate cemeteries, sports fields, and other community facilities. (Mimbres Basin) Element C on the attached map. The Bayard wastewater treatment plant has a design capacity to treat 600,000 gallons average daily flow or about 672 AFY. Currently, about 500,000 gallons is treated on a daily basis. This project element would enable effluent reuse to displace the use of potable water for irrigation, thereby conserving groundwater in the well fields. Trumm Engineering – MBI Inc has developed a manual specific to Bayard that is titled *"City of Bayard, New Mexico Phase 2 Effluent Reuse Project, Project Manual, September 2010."* There is also a set of engineered plans to accompany the manual. The estimated cost of the new infrastructure is $4,500,000.

D. Groundwater recharge (aquifer storage and recovery) at the Franks Well Field . (Gila Basin). Element Da on the attached map. This project element would:

a. provide a link with the existing pipeline that conveys water from Bill Evans Lake to the Tyrone Mine, and a new pumping station would deliver water to the Franks Well Field, where it could be directly injected through wells into the aquifer or allowed to infiltrate into the aquifer along natural channels. A recharge rate of one cubic foot per second over 365 days would yield about 750 AFY, an amount that would roughly offset the existing use at the well field and stop current draw down of groundwater. Two cubic feet per second would offset existing use and make an additional 750 AFY available to replenish draw down stemming from more than 50 years of past use.

In 1984, J.W. Hernandez, W.G. Hines, and F.D. Trauger analyzed a similar project in considerable detail on behalf of the Town of Silver City and the Interstate Stream Commission. Among many issues addressed, the analysis concluded that mixing Gila River water and ground water would not be a problem. The title of this analysis is "*Evaluation of a Municipal Water Supply for the Silver City Area Using Ground Water Recharge of Water from Conner Reservoir on the Gila River. August 1984.*"

Recently Balleau Groundwater, Inc. developed a Technical Memorandum for the project that includes a feasibility analysis and costs. The title of this memorandum is *"Groundwater Recharge Analysis and Estimate of Recharge Option Costs. July 2010."* Capital costs for the infiltration scenario are currently estimated to be $4,340,000 and annual operation and maintenance costs to be $378,000. The cost of leasing or purchasing water rights from the Tyrone Mine would be in addition to the costs already identified.

b. provide a new and larger water transmission line from Franks Well Field to support the regional proposal. Element Dd on the attached map. The project would increase the delivery capacity of the line from 1,000 gpm to 2,000 gpm, an increase in capacity that would complement an aquifer storage and recovery project at the well field.

E. A new water transmission line linking Hurley, Bayard, Santa Clara, and Silver City. (Mimbres Basin) Element E on the attached map. The system could either draw on supplies from the storage tanks in Silver City and deliver water to the east through a gravity system to community storage tanks or the system could draw on supplies from a new well field in the vicinity of Grant County Airport and deliver water to the west through a series of pumping stations to community storage tanks. A proposal description and cost estimate was developed by Engineers Inc. Capital costs are currently estimated to be approximately $14,000,000 and the annual operating and maintenance costs to be approximately $166,500 for the delivery of 816 AFY.

Energy Efficiency

To the extent practical (based on local site physical features, land availability and cost-effectiveness), financing will also be sought to install solar PV systems to reduce water delivery dependence on more costly fossil fuel sources. Funding mechanisms might include Solar Power Purchase Agreements (PPA), bond revenues from Clean Renewable Energy Bonds (CREBs), or USDA, DOE and other federal sources.

FORM 14 A

USE THIS FORM TO COMPLETE ANSWERS TO CRITERIA 1 THROUGH 4. NUMBER EACH ADDITIONAL RESPONSE WITH THE CORRESPONDING CRITERIA NUMBER AND SUB-CRITERIA. USE AS MANY PAGES AS NEEDED.

Criteria 1: State whether the proposal is for the "New Mexico Unit," a "water utilization alternative," or both.
The proposal is a water utilization alternative.

Criteria 2: Describe how the proposal will meet a "water supply demand" in the Southwest New Mexico Water Planning Region, comprised of Catron, Grant, Hidalgo, and Luna Counties.
This proposal specifically addresses the needs of central Grant County. Identified below are the type of public water supply **needs** for each municipality, the **scale** of total need for additional water, potential **sources** of new water, and a framework of existing local **attributes** that influenced the development of the regional proposal.

The principal source of data cited in this section is the analytical report performed by INTERA, Inc under contract with the Interstate Stream Commission. This report is titled *"Water Resources Assessment of the Silver City Area, Arizona Settlements Act Planning Process 2009."* Other principal data sources include the 2010 U.S. Census, the comprehensive plans of Bayard, Santa Clara, and Silver City, and the *"Supplement on Water Use and Well field Service—A 40-year water plan for the Town of Silver City, New Mexico. 2006,"* by Balleau Groundwater, Inc.

a) **Water Supply Demand: Statement of Needs**
The public water systems of Bayard, Hurley, Santa Clara, and Silver City currently provide water to approximately 26,000 people in central Grant County. Each system has its own needs, challenges, and problems including—variously--inadequate water diversion and delivery infrastructure, insufficient access to water sources, and limitations associated with the availability and the location of water rights.

The specific community needs and challenges include the following:

- Hurley supplies water to a municipal population of 1,297 (2010 Census). The community has no water rights and no diversion wells, and it depends on Freeport McMoran Inc to provide its water. It is two years into a ten-year water leasing agreement with the mining company, which proposes to end the arrangement at that time. Hurley also provides water to the unincorporated community of North Hurley.
- Bayard supplies water to a municipal population of 2,328 (2010 Census). Overall, the community owns 742 AFY of water rights. It has antiquated water diversion and delivery infrastructure, the water rights for active well fields may be insufficient to meet extra demand generated during extreme

dry periods, and additional water rights owned by the community are tied to sources too distant to be accessed economically. Bayard also supplies water to the unincorporated community of Hanover.

- Santa Clara supplies water to a municipal population of 1,686 (2010 Census). The community has approximately 515 AFY of water rights. It has a single well field near Lone Mountain that is the main water source for the community, and an infiltration gallery in Twin Sisters creek, which runs through town--usually as a dry streambed. The diversion and delivery infrastructure is new, but the water rights assigned to the well field (272.9 AFY) may be insufficient to meet extra demand generated during extreme dry periods, and the infiltration gallery yields a little over a third (90 AFY) of the water rights assigned to it (241.9 AFY), and sometimes none at all in the dry months of the year. Santa Clara also supplies water to the new Fort Bayard Medical Center.
- Each of these municipalities participates in a regional wastewater treatment plant that has a design capacity of 600,00 gallons of daily treatment or approximately 672 AFY. Currently, the treatment plant treats approximately 500,000 gallons a day. This water is disposed of on the tailings piles of the Chino Mine, which is owned by Freeport McMoRan Inc. The mining company has informed the operator of the treatment plant that it will no longer dispose of the wastewater in two years. The communities are developing an effluent reuse plan for irrigation of community facilities.
- Silver City supplies water to a municipal population of 10,315 (2010 Census), and it supplies another 10,000 people more or less in adjacent areas of the county, including the communities of Tyrone, Pinos Altos, and Arenas Valley. The Town owns 4,566 AFY of water rights that are assigned to its well fields, and it pumps approximately 2,800 AFY. The amount necessary to pump has declined in recent years with improvements to leak detection and rising block rate structures. In their current configuration, these wells can sustainably yield 4,200 AFY, an amount modestly less than the assigned water rights. Like Bayard, the Town also owns some water rights (193.2 AFY) that are stranded or made inaccessible by distance, in this case by the Grant County airport. Some of the existing infrastructure is inadequate to pump and deliver the yield capacity of the wells, especially in the Franks Well Field, and at the Gabby Hayes Well
- Silver City also operates a wastewater treatment plant that over the last 30 years has discharged an average of 750 AFY of water into the San Vicente arroyo. This discharge has created a rising mound in the local groundwater that may influence the operation of the regional landfill.

b) Water Supply Demand: Scale of Needs

A reliable public water supply is essential to the welfare of the communities of central Grant County. Substantial improvements need to be made to

infrastructure, but the total amount of additional water and water rights necessary to meet the current and future needs of the communities is modest.

- In 2000, water use in Grant County was measured as 57,319 AFY.
- Public water supplies comprised only 7% of all these withdrawals or approximately 4,012 AFY.
- The current total number of water rights for public water supplies is 6,015 AFY.
- Based on a study performed on behalf of the New Mexico Interstate Stream Commission in 2009, the population of Grant County was estimated to increase at a rate of .75% annually. This study is titled *"A Report on Historical and Future Population Dynamics in NM. 2008. A. Alcantara."* A .75% annual increase would approximate a 35 % increase in local population over the next 40 years. A corresponding 35% increase in water demand might require that an additional 1,404 AFY be withdrawn (4,012 AFY x 35%). The total amount of water withdrawn would then be 5,416 AFY, which is an amount falling well within the total allocated waters rights of the municipalities (6,015 AFY.)
- Should such a 35% population increase occur, an appropriate planning precaution might be to acquire additional water rights in an amount (about 1,400 AFY) adequate to serve the new increment of the forecast and to keep the surplus in reserve as a buffer. In that case the total amount of water rights supporting public water supplies would be 6,015 + 1,400 = 7,445.
- Over the last 30 years, on the other hand, populations in Bayard, Hurley, Santa Clara, and Silver City have actually declined by nine percent.

Community/ Date	Bayard	Hurley	Santa Clara	Silver City
1980	3,036	1,616	1,968	10,315
2010	2,328	1,297	1,686	10,474

Some demographers expect a lower rate of increase and in some cases even continued population declines. Another appropriate planning precaution would be to not over invest in new water acquisitions. In other words, acquisitions should be balanced with reasonable prospects of meeting likely needs and of actually paying for the investment (more new ratepayers or increased rates).

c) Water Supply Demand: Potential New Sources

There exist several options for acquiring additional water rights. Below are some examples. Several are subject to the constraints of the critical block administrative system of the Office of the State Engineer.

- **Mining**. Mining used 38% of the water withdrawn in Grant County in 2000 or approximately 21,781 AFY. Based on documents submitted by

the mines to New Mexico regulatory agencies (including testimony regarding proposed closure plans for the Tyrone Mine), mining is expected to decline as an economic activity over the next 40 years. The water rights associated with the mining activity will need to find new beneficial uses or revert to the state. Certainly, municipal use, through lease or purchase, is a candidate for a new beneficial use, and the Town of Silver City is negotiating with Freeport McMoRan to that end.

- Advantages: Proposal already under discussion.
  Market cost for acquisition (lease or purchase).
  Qualifies for AWSA financial support ($66,000,000).
- Constraints: Modest distance (5 miles) between existing waterline and existing well field requires infrastructure costs for water delivery.
  Requires approval by the Office of the State Engineer.

- **Agriculture**. Agriculture used 52% of water withdrawn in Grant County in 2000 or approximately 29,805 AFY. Recently, at least two local ranches have offered for sale or lease up to 3,000 AFY for municipal use.
  - Advantages: Proposal already under discussion.
    Market cost for acquisition (lease or purchase).
    Qualifies for AWSA financial support ($66,000,000).
  - Constraints: Modest distance (10 miles) between current place of diversion and municipal use requires infrastructure costs for water delivery.
    Requires approval by the Office of the State Engineer.

- **Return Flow Credits and Wastewater Reuse**. Silver City will apply for 750 AFY of return flow credits based the annual discharge from its Waste Water Treatment Plant and the measured and documented contribution this water makes to the aquifer. Bayard, Hurley, and Santa Clara are contributors to a system that can ultimately generate 672 AFY. The combined amount of the two systems generates enough water to meet the ISC estimate of population growth.
  - Advantages: No acquisition costs.
    No additional infrastructure costs for delivery.
    Regional model for water reuse.
    Qualifies for AWSA financial support ($66,000,000).
  - Constraints: Requires approval by Office of the State Engineer.

- **Conservation**. Water leaks in transmission lines account for as much as 20% of water use in some of the local water supplies. Other water savings

could be generated by more efficient fixtures and by changes in time of use.

- Advantages: No water acquisition costs.
  No additional costs for diversion or delivery infrastructure.
  No approval required by the Office of the State Engineer.
  Qualifies for AWSA financial support ($66,000,000).
- Constraints: Modest infrastructure improvement costs.

- **New Mexico Unit on the Gila River.** Under the terms of the Arizona Water Settlements Act and the Consumptive Use and Forbearance Agreement, New Mexico is eligible to divert up to 14,000 AFY from the Gila River.
  - Advantages: New water source.
    Qualifies for AWSA support and an additional increment ($66,000,000 + $34,000,000 or perhaps $62,000,000 = $100,000,000 to $128,000,000).
  - Constraints: Acquisition has contractual limitations, including exchange requirements with water bank in Arizona.
    Diversion infrastructure very expensive ($220,000,000 to $300,000,000 according to testimony before Congress by the Interstate Stream Commission).
    Substantial distance (25 miles) between point of diversion and place of municipal use requires infrastructure costs for delivery.
    Requires approval of the U.S Fish and Wildlife Service.
    Requires approval of the N.M. Game and Fish Department.
    Diversions always subject to the Endangered Species Act.
    Requires approval of the Bureau of Reclamation.
    Requires approval of the Office of the State Engineer.

d) Water Supply Demand: Framing Attributes of Local Public Water Supplies

The proposal for a regional system builds on three attributes of public water systems, water sources, and demand in central Grant County:

- A modest regional water delivery system already exists. The proposal modestly expands (by 20%) and formalizes the system.

Currently, Silver City (pop. 10,315 in 2010) provides water to its own residents and to an additional 10,000 people living outside the municipal limits. These numbers represents a little over two-thirds of the entire Grant County population (pop. 29,514 in 2010). Silver City serves these additional people either directly through its own waterlines or indirectly by supplying water associations that deliver water to Tyrone, Pinos Altos, Arenas Valley, and points in between.

The proposal would link Santa Clara (pop. 1,686 in 2010) and Bayard (pop. 2,328 in 2010) with a formal regional system to provide a reliable source of water to supplement their individual systems. The communities would continue to own and manage their own water rights and their own water delivery systems and could draw on the regional system as a backup in times of need.

The Grant County Water Commission could own the regional waterline.

The proposal would also link Hurley (pop. 1,297 in 2010) with the regional system to provide supplemental support. In addition, the proposal would dedicate 193.2 AFY of water rights for use by Hurley, which currently depends entirely on Freeport McMoRan Inc for all of its water needs. The proposal includes the construction of a well at a new source by the airport and a delivery system from the well to Hurley.

These communities also serve Hanover, North Hurley and the Fort Bayard Medical Center.

- Central Grant County enjoys a very favorable geographic setting that supports an abundant regional aquifer and its ready natural recharge.

The high mountains just to the north receive significantly more rain and snow than the lower elevations of the communities under discussion. This precipitation runs down the canyons and arroyos to sink into the loose alluvial gravels and deep conglomerates of the flatlands that stretch south to the international border. The Mangas Trench, in particular, where Silver City well fields are located and the airport well is proposed, is an especially rich water feature.

Silver City not only draws water from the Mangas Trench, it contributes water to the geologic feature as well. The Town discharges on average 750 AFY of water from the waste water treatment plant to the San Vicente Arroyo, which is the principal drainage in the Mangas Trench, and hydrological monitoring has

demonstrated that 99% of that water enters the aquifer. Water levels in the vicinity of the treatment plant are rising.

The Town intends to apply for a return flow credit of 750 AFY to supplement its existing 4,566.64 AFY of water rights.

- An existing waterline linking surface water at Bill Evans Lake and the Tyrone Mine passes within five miles of the Franks Well Field.

  The proximity of this waterline to a principal well field offers of the possibility of modest conjunctive use of surface water and ground water to support a regional water system that is a little larger than the current informal system.

  The surface water could recharge the ground water in the vicinity of the well field (Gila Basin.) A constant flow of one cubic-feet-per-second will yield approximately 750 AFY of water.

Criteria 3: Describe how the proposal considers the Gila Environment and describe how any negative impacts might be mitigated.
Only Project Element Da will draw on new (to the system) resources in the Gila Environment. The proposal minimizes impact in two ways:

a) Element Da will use water drawn an existing pipeline that draws from an existing impoundment (Bill Evans Lake), which is in turn supplied by an existing diversion on the Gila River. The features have all received regulatory approvals, and no new burden or impact is proposed. An additional five miles of pipeline would have to be constructed from the Bill Evans pipeline to reach the actual well field, and all regulatory standards and best management practices would be instituted.

b) By recharging the Franks Well Field, the potential long-term pumping effects of groundwater withdrawal on Mangas Springs can be reduced or even averted.

All other activities of the proposal are located in the Mimbres Basin and would have no effect on the Gila Environment.

Criteria 4: Describe how the proposal considers the historic uses of and future demands for water in the Southwest New Mexico Water Planning Region and the traditions, cultures, and customs affecting those uses.

a) **Historic Uses, traditions, cultures, and customs:** The proposal recognizes that living in towns and in aggregated but unincorporated clusters of housing is a use established early in Grant County history. Pinos Altos was established in 1860 and became Grant County's first county seat. In 1867, the county seat was moved

to Santa Clara (formerly Central City), and it was moved again finally to Silver City in the 1870s. These communities were generally founded to support miners and mining interests, although Santa Clara began as a suttlers service area supporting the military post of Fort Bayard. Local farming and ranching activities were largely initiated after the establishment of those communities (and others such as Georgetown, etc.), in order to supply the new residents with essential agricultural products. The communities of Bayard and Hurley were established later as centers for mine administration and residential locations for miners working in the nearby large open pit mine. In short, it is reasonable to say that municipal living, mining, as well as farming and ranching were and still are contemporaneous traditional activities that all present equally valid claims for water needs.

There is also an established history and culture of water transfers between those economic sectors. In the 1950s, the Phelps Dodge mining company acquired numerous water rights in the Cliff-Gila valley, which it (and its successors) used (and still use) to support mining activities. By retaining the original farms that were the source of those water rights, the mining companies can and do transfer water rights back and forth between mining uses and agricultural uses. In fact, a mining company is by far the largest owner of irrigated land in that valley. Phelps Dodge and Exxon, which invested in mines locally, have in the past also conveyed water rights and even wells to Silver City in order to ensure adequate public water supplies that support housing for miners. Local ranches have also sold or conveyed water rights to municipalities for public water supply use, and some ranches have subdivided their land, and relied on these public water supplies to serve the new developments. In short, water and water rights in Grant County have moved across economic sector lines to the mutual benefit of all parties based on market demand and willing sellers.

Finally, it should be noted that public water supplies constituted only 7% of all water withdrawals in Grant County in 2000, while irrigated agriculture constituted 52% and mining 38%. The effects of modestly increasing public water supply withdrawals on the other economic sectors would likely be very modest indeed: a 35% increase of a 7% share is only a 2% increase in overall usage. Given the declining mining activities that are forecast, increasing public water supplies may in fact have no negative impact in actual use allocations.

b) **Future Demands:** The future public water supply needs are tied to modest growth projections that have been discussed at more length above in Criteria 2. There are substantial infrastructure needs to provide reliable access to people currently using public water supplies, but the amount of additional supplies suitable to accommodate future growth is modest—approximately 1,400 AFY.

PROJECT ELEMENTS