

GILA WATER COMMISSION: WATER UTILIZATION ALTERNATIVE TIER 2 APPLICATION

Brief Project Description: This regional project improves and augments access to public water supplies that currently serve 26,000 people in central Grant County. The project proposal has been modified from the Tier 1 submittal to address concerns of the Interstate Stream Commission. It retains two principal elements:

- I. The development of a new well field in the vicinity of Grant County Airport.**
 - a. This wellfield would make 193.2 AFY of existing water rights available to Hurley, which does not have its own supply of water. These water rights are currently stranded by the critical block administrative system of OSE. The wellfield would include three wells, a treatment facility and other appropriate infrastructure, including a pipeline to Hurley.
 - b. In addition, this wellfield would provide a point of diversion for new return flow credits of 750 AFY generated by the Silver City wastewater treatment plant and returned to the aquifer, where it would become available for reuse downstream. This conservation measure would make water available for reuse in Hurley, Bayard, Santa Clara, Silver City, and adjacent unincorporated neighborhoods. An initial credit application for 750 AFY is currently under development for submission to the Office of the State Engineer (OSE).

Note: Effluent reuse is a common and widely approved strategy for conserving water. Typically, reuse involves the irrigation of public facilities such as playing fields and cemeteries. In the case of this proposal, effluent would also be reused, downstream of its point of return to the aquifer, and for the full suite of uses that benefit a municipality. This could be a model for water management in arid and semi arid areas.

Note: The 750 AFY is a return to the aquifer of approximately 27% of the 2,800 AFY that Silver City pumps.

- II. The construction of an inter-community pipeline.**

This new infrastructure would link the public water supplies of Hurley, Bayard, Santa Clara, Silver City, and public water delivery systems in adjacent unincorporated areas. The intercommunity pipeline would deliver water as needed by the participating entities to supplement their own water supplies. In every case each entity would continue to manage its own established supply and system.

The development of elements I and II can be staged in four phases:

1. Wellfield at airport and pipeline to Hurley
2. Pipeline linking Hurley with Bayard

3. Pipeline Linking Bayard with Santa Clara
4. Pipeline linking Santa Clara with Silver City

The total cost for the project is \$30,123,297. The Proposal seeks 50% of the cost from AWSA funding: \$15,061,685.

***Note:** The proposal for a new wellfield and an inter-community pipeline builds on attributes of public water systems, water sources, and demand in central Grant County:*

1. *A modest regional water delivery system already exists. The proposal modestly expands the system and formalizes it.*
2. *Future demand is expected to be modest*
3. *Central Grant County enjoys a very favorable geographic setting that supports an abundant regional aquifer and its natural recharge*
4. *A water mound is building in the Silver City area, raising local water levels, as a result of effluent discharge into the San Vicente Arroyo. This water is eligible for return flow credits.*

TIER 2 CRITERIA

CRITERION 1. (570) *If the proposal would extend the water supply through conservation, or increase the supply through development of new water,*

a. *Describe the location and verify the ownership and legal access to lands related to the proposal. [0 to 30 points]*

Element I: The well field is located immediately to the west of the Grant County Airport in the NE ¼ SE ¼ and NW ¼ and SW ¼ of Section 22 of Township 19 South, Range 13 West, NMPM. By contractual agreement with the owners of the land, the Town of Silver City has access to explore for ground water, to drill wells, and to build access roads, pumping facilities, pipelines, etc. on the property.

Hurley will use the first increment of water that is made available (193 AFY). Between Hurley and the well field site, the property owners are the Chino Mines Company, which is part of Freeport McMoRan Copper and Gold Company, and the Grant County airport, which is owned by Grant County. While easements would have to be secured through these properties in order to serve Hurley, the neighboring owners are familiar with the well field proposal and supportive. Currently, FMI provides all of the water used in Hurley, and the company would like to end this arrangement. The well field proposal makes the termination feasible.

Some of the water could also be available to the Grant County Airport Industrial Park for the benefit of economic development in the county.

Ownership and legal access are not likely to be problem issues.

Element II: This element provides for an inter-community water pipeline linking the public water supplies of Hurley, Bayard, Santa Clara, Silver City, and public water delivery systems in adjacent unincorporated areas. Each system would retain ownership of its infrastructure and of its water rights permitted by NMOSE. The common pipeline would deliver water as needed by the participating entities to supplement their own water supplies. The supplemental water would come from the new well field near Grant County airport or from the Silver City extended system. The linking main could be jointly owned, probably through the agency of the Grant County Water Commission. The corridor for the linkage would likely be the right-of-way (ROW) along Hwy 180 East. The New Mexico Department of Transportation would have to provide an easement. The department commonly does so for public utility projects.

Ownership and legal access are not likely to be problem issues.

b. *Identify the source of the water to be put to use. [0 – 10 points]*

Water identified in Element I in this proposal will be diverted at a new well field near Grant County airport. The source of the water is the Mangas Trench east of

the continental divide. The Mangas Trench is naturally recharged at a rate of 16,000 AFY on average and which has approximately 15,000,000 AF in storage.

Documents identifying specific information on the hydrologic characteristics of the Mangas Trench, the measured volume of discharge water returning to the aquifer, and the hydrologic capacity and influence of the wellfield are identified in ***Criterion 2.b***.

Note: Currently, the bulk of municipal water pumping in central Grant County occurs in the western part of the Mangas Trench. The new wellfield would mitigate the drawdown effects of increased pumping in this area in order to accommodate demographic growth by shifting additional municipal pumping farther east in the Trench.

c. Describe and quantify whether and how the proposal would extend the water supply through conservation, or increase the supply of new water in the Southwest Planning Region. [4 points for each 10 AF up to 500 points]

This project provides for the development of 750 AFY of new water rights that are the product of reusing (conservation) treated effluent that is discharged from the Silver City wastewater treatment plant into San Vicente Arroyo. A new wellfield near the Grant County airport would withdraw this water approximately eight miles downstream of the point of discharge.

Another 193 AFY (rounded) of existing water rights would also be made available through the development of the new wellfield. These water rights are currently permitted for municipal use but have never been used because they are stranded by lack of infrastructure (wells and a pipeline).

The amount of water developed in the near term through the wellfield would be 943 AFY.

Note: In the Tier I application for this proposal, water saving measures were identified as a means of accommodating water needed for growth. Silver City has recently secured \$50,000 I funding to develop a new water conservation plan. The goal is to accomplish at least a 20% reduction in current use through conservation measures such as detecting leaks, managing the timing of outdoor watering, and encouraging the use of more efficient residential fixtures. A 20 % reduction in current use (2,800 AFY) would conserve an additional 560 AFY. This water would also be available to accommodate future demographic growth, supplementing 750 AFY of return flow previously identified.

The total amount of water that this proposal expects to conserve through reuse and use reduction is (750 AFY + 560 AFY) is 1,310 AFY.

A 20% savings of the total amount of water rights currently permitted to Silver City—if demographic growth required their full use—would increase its conservation to 913 AFY. The conservation measures developed through Silver City’s plan might be exportable on a voluntary basis to other municipalities in central Grant County, which would further increase conservation.

d. Demonstrate how the proposal would meet AWSA and CUFA requirements.[up to 30 points]

This project proposal is developed for the needs of a county in southwest New Mexico. It is designed to meet a water supply/demand as required by the AWSA. It is a water utilization alternative that is alternative to a NM Unit. It does not involve any diversions on the Gila River, and therefore meets the CUFA terms that require the specified flows for the Gila and San Francisco rivers. The flows of those rivers are unaffected by this project.

CRITERION 2 [40 points: Describe the proposal and its technical feasibility.

a. Include any (or reference publicly available) technical and engineering studies completed and demonstrate how those studies support the proposal [up to 20 points]

This project provides for the development of a new well field in the vicinity of the Grant County airport that would make 943 AFY of water for municipal use. A pipeline would deliver water to Hurley, which has a public water system but no water rights. The pipeline could also deliver water by request to Bayard, Santa Clara, Silver City, and to the water associations that serve nearby unincorporated neighborhoods and communities such as Pinos Altos, Tyrone, Hanover, North Hurley, and Fort Bayard.

The pipeline would allow all of these communities to have emergency supplies to buffer against occasions when demand exceeds either physical water supply or permitted water rights, as occasionally happens currently. Switching to the supplemental water would allow the communities to meet demand, especially in the heat of summer and during extended dry periods. The new supplemental source also enables communities to conserve their own well fields against deep draw-downs by allowing their wells to recharge.

The technical difficulties of this project are modest: wells and pipelines. These are common forms of infrastructure. Their construction is not different in kind from many similar water line extensions that have been built in central Grant County. The engineering expertise for planning, designing, and overseeing resides within the communities. Geo-technical and ecologic assessments as well as economic feasibility studies would be performed as part of the approval process.

Preliminary Cost Estimates for this project have been developed by Engineers Inc. They are reported in **Criterion 3.a.**

- b. *Include any (or reference any publicly available) hydrologic, ecologic, or geotechnical studies completed and demonstrate how information included in these studies specifically supports or detracts from the proposal. [up to 20 points]***

Balleau Groundwater Inc has researched and drafted two pertinent documents: 1) *Effluent Percolation into the Gila Group Aquifer near Silver City, New Mexico. November 2010* and 2) *Hydrological Effects of Wellfield Use in Area of Grant County Airport. March 1 2011.* These documents are submitted in e-format as separate files along with this application.

In addition, Balleau has drafted a summary of the ground water model that the firm is currently developing for the Mangas Trench. The summary in e-format has also been submitted as a file accompanying this application.

The first document demonstrates that 99% of effluent discharged by the Silver City wastewater treatment plant is returned to the regional aquifer and recommends that the Town apply for a return flow credit with OSE. The Town is currently making that application.

The second study demonstrates that the wellfield at the Grant County Airport has access to sufficient ground water to support proposed 943 AFY of water development. In addition, a test well has been drilled at the site that also demonstrates the feasibility of the site. Balleau also analyzed the extent of the project's impact on the entire Mangas Trench and concluded that effects did not enter the Gila Basin even after 100 years of pumping. That information was submitted in the Tier 1 application.

The third submittal provides a characterization of the Mangas Trench in the Mimbres Basin.

CRITERION 3[40] Quantify estimated costs.

- a. Quantify the proposal's estimated costs, including planning, design, and/or construction, and administration or oversight.***

Preliminary development costs estimates have been provided by Engineers Inc. They are summarized below in Table 1. The full Engineers Opinion of Probable Costs is located in Appendix A.

Table 1 - Estimated development costs of proposal –

Services	Phase I	Phase II	Phase III	Phase IV	Total
Planning	\$339,519.75	\$111,906.23	\$69,385.73	\$276,769.80	\$797,581.51
Design	\$820,259.10	\$253,707.80	\$121,894.25	\$592,448.01	\$1,788,309.16
Construction	\$12,160,000.00	\$3,811,000.00	\$1,831,000.00	\$8,738,000.00	\$26,540,000.00
Oversight	\$456,988.00	\$143,222.14	\$68,811.26	\$328,384.96	\$997,406.36
Total	\$13,776,766.85	\$4,319,836.17	\$2,091,091.24	\$9,935,602.77	\$30,123,297.03

- b. If applicable, quantify the proposed project’s on-going administrative, operational, and maintenance costs. [up to 10 points.***

Preliminary operations and maintenance costs estimates have been provided by Engineers Inc. They are summarized below in Table 2. The full Engineers Opinion of Probable Costs is located in Appendix A.

Table 2 - Estimated operations and maintenance costs of proposal –

O&M	Phases I-III	Phase IV	Total
Annual Power Cost	\$240,421.25	\$131,927.93	\$372,349.18
Annual Maintenance Parts and Supply	\$120,210.62	\$65,963.97	\$186,174.59
Annual Operating Manpower	\$65,520.00	\$65,520.00	\$131,040.00
Annual Disinfection	\$6,300.00	\$18,000.00	\$24,300.00
Annual Vehicle	\$9,216.25	\$9,216.25	\$18,432.50
Total	\$441,668.12	\$290,628.15	\$732,296.27

- c. Describe environmental compliance activities, and quantify the costs for environmental mitigation and restoration related to the proposal. [up to 10 points]***

Required permits from and consultations with state and federal agencies will prescribe environmental compliance activities to be built into the project’s implementation. A NEPA review of the Preliminary Engineering Plan and the Environmental Information Documents will determine the need for either a Categorical Exclusion, an Environmental Assessment, or a full Environmental Impact Statement. As most of the project has a minimal footprint, and much of the project is planned for previously disturbed ground (highway rights-of-way, etc.), environmental mitigation and restoration are not expected to require much beyond reseeding and mulching of the disturbed corridor.

Permits will be obtained as required from:

- US Army Corps of Engineers,
- FEMA/Floodplain Administrator,
- US Fish and Wildlife Service, New Mexico
- Various bureaus of the Environment Department, and
- New Mexico Department of Transportation.

There will be formal consultations with:

- NM State Historic Preservation Office,
- New Mexico Department of Game and Fish,
- Relevant tribes and pueblos,
- Grant County, and
- Utilities departments of the municipalities of Bayard, Hurley, Santa Clara, and Silver City to mitigate any causes of concern.

Potential costs for these activities include:

- Permitting and management (NMED, USACE, USFWS, FEMA/SWPPP) - \$84,500
- Archaeological and biological surveys along project corridor - \$66,000
- Topographic survey along project corridor - \$24,000
- Easement acquisition and NMDOT utility permits - \$90,000
- Mitigation and restoration along project corridor (reseeding and mulching) - \$300,000

d. Quantify the AWSA funding sought for the proposal and for the pendency of the proposed activity's or project's duration.

The total project costs are \$30,123,297.

The Grant County Water Commission seeks AWSA funding for 50% of the project, which is \$15,061,648 (rounded).

*Note: The Grant County Water Commission will seek the remaining funds from other sources. A potential list of additional funding sources is identified in **Criterion 5.c**. The New Mexico Finance Authority has expressed interest in supporting this project, possibly with Colonias funding, and has already asked for a Preliminary Engineering Report.*

The project is phased. The first phase will begin when the funding approvals are secured, and the project will continue as funding is secured for each successive phase. If funding for the entire project were secured, it is likely that the planning, design, and review for approval would require 2 years. Construction would require another 2 years.

Phasing delays might require completion timelines to stretch out over a longer time.

The AWSA funding will be used only for planning, design, and construction, including all of the associated review and approval processes. At the completion of construction, AWSA and matching grant funds will no longer be needed.

The costs of operating and managing the project infrastructure and water assets will be paid by those municipalities and water associations actually using the supplemental water.

The expected working life of the project's infrastructure is 50 years.

Criterion 4. [40] If proposal impacts, beneficially or adversely, the environment of the Southwest Planning Region, the Gila River, its tributaries or associated riparian corridors, use the best available science to:

a. Describe and quantify how the proposal might impact the project site and environment, particularly state and federally listed species. [up to 10 points]

This proposal will benefit the project area by ensuring a safer and more reliable supply of drinking water to its residents. The urban environment will be improved as a result. For an expanded list of benefits see **Criterion 6.f.**

In regard to the natural environment, there are no anticipated adverse affects:

The project consists primarily of a long narrow corridor of a pipeline delivering water from a well site in southeastern Grant County to, and through, the municipalities of Hurley, Bayard, Santa Clara, and Silver City. Associated with the corridor are several pumping stations and a tank site near Silver City, all of which would have a relatively small footprint on the environment. In fact, much of the project location has already been disturbed either by highways or other utility easements.

Based on discussions with a local engineer, Gary Berg from Engineers Inc, (*personal communication 12/11/11*) who has done similar projects within the habitat types of the project area, the project would not be expected to have any measurable impact on state or federally listed species.:

- The proposed project is located entirely outside the Gila River Basin. It will not impact the environment of the river, its tributaries, or associated riparian corridors. (See the relevant analysis in the Tier 1 application)
- Habitats for the state and federally listed species that might be found within Grant County generally occur in and along the Gila or Mimbres rivers or in the montane habitats of the Gila National Forest. These habitats lie outside the project area.
- The two areas of potential concern within the project area, Maude's Canyon and Twin Sisters Creek, are intermittent streams. They will be crossed in places that have previously been disturbed, and the project's crossing would be a narrow corridor with at most a fifteen-foot

disturbance. Project managers will consult with all appropriate agencies that have wildlife oversight responsibilities to ensure adequate measures to protect local biota during and after the project construction.

b. Describe and quantify the proposal's efforts to mitigate possible adverse impacts on the environment, particularly riparian areas and state and federally listed species in the Gila Basin and at the specific location of the proposal. [up to 10 points]

As previously described, the project area lies entirely outside the Gila Basin. In the Mimbres Basin, it only crosses two intermittent streams, in areas adjacent to Hwy 180, with no known occurrences of state and federally listed species in those areas. Appropriate measures to avoid or mitigate harmful impacts include:

- A complete archeological and biological survey of the project area completed prior to construction. Estimated cost: \$30,000
- Consultation by planners with those agencies responsible for protecting listed flora and fauna to ensure that there are no harmful impacts stemming from the project. Estimated report costs are \$10,000. Other associated costs are embedded in the in design cost.
- All necessary permits will be secured. Estimated cost \$67,000.
- Project oversight during construction will identify potential problems that were unanticipated, consult again with appropriate agencies, and implement appropriate measures to resolve the problem. Estimated cost is embedded in the cost for construction oversight.

Local experience in the area, the institutional history of similar work within the project area, and best construction management practices, will anticipate, avoid, and/or mitigate potential impacts on the biota within the project area.

c. Describe and quantify how the proposal may benefit the environment, particularly riparian areas and state and federally listed species in the Gila Basin and at the specific location of the proposal. [up to 10 points]

This proposal will benefit the project area by ensuring a safer and more reliable supply of drinking water to its residents. The urban environment will be improved as a result. For an expanded list of benefits see **Criterion 6.f.**

Aside from specific mitigation activities at the project site such as re-seeding and mulching, which will eventually create new growth of native flora and forage for faunal inhabitants, no further wildlife benefit at the project site is expected to accrue. Estimated costs: \$265,000

Finally, an important environmental benefit of the proposal is the avoidance of harm to the Gila River and to the biota of the larger Gila Basin itself: The project does not alter the natural flow regimes of the Gila River. It entails no harmful effects to plants and animals in the river or in the riparian areas. It has no effect

on the state and federally listed species that are widely present in and along the Gila River.

As a result, the project would also not involve any expensive and on-going mitigation measures that might be required to offset harms. Estimated cost: ?

d. List any environmental statutes, rules, or regulations that may apply to the proposal, and demonstrate how the proposal implementation will comply with such laws, rules or regulations. [up to 10 points]

Design and construction will comply with all the requirements of National Environmental Protection Act (NEPA), which governs all such federal activities. This is an over-riding umbrella of regulatory direction to which the project will conform.

Other environmental statutes, rules and regulations to which the project activities will adhere include:

- Endangered Species Act (ESA) - establishes standards for preventing threats to and mitigating and monitoring impacts on endangered species
- Safe Drinking Water Act (SDWA) - sets the protection standards for public water systems and underground sources of drinking water
- Clean Water Act (CWA) - requires permits and sets federal standards for disturbance of streams and waters and storm water discharges
- Occupational Safety and Health Act (OSHA) - assures safe and healthful working conditions

Permits for design, construction, and monitoring will be obtained and the work managed to fully comply with all local, state, and federal laws, rules, regulations, and guidelines. Local, state, and federal agencies will be consulted to assure satisfaction that the work progresses with acceptable standards.

The municipalities involved in the Grant County Water Commission have successfully completed numerous infrastructure projects in the past, and their combined experience assures regulatory compliance will be met.

CRITERION 5: Describe any economic or cost analysis information and data for the proposal:

- a. Quantify estimated economic benefits including environmental, recreation, value of water itself, value of the water to the regional economy, increased economic growth, protection against the loss of jobs, agriculture, ranching, local economic sustainability or growth, or other. [up to 10 points]**

Value of Water Rights (or Value of Water Itself):

The project will provide for the development of 750 AFY of water rights for municipal use in central Grant County through conservation. It will also provide

access for the same use to an additional 193 AFY of water rights that are currently unavailable for lack of infrastructure.

The water from these rights will be delivered to existing municipal systems.

The following observations regarding water values are made for the purpose of framing and suggesting the potential benefits of the project. Should this project be advanced, the applicant recommends that more technical economic analyses be performed to confirm benefits using such appropriate tools as vector auto regression models, and aggregated production functions and cost functions.

Value Methods

Among various methods for assessing the value of water rights identified in the literature of water policy, two are considered in the case of this proposal:

- **Water Market Transactions.**
- **Cost of Water Delivery as a Metric of Value**, involving the Comparison of Alternative Methods of Development and Delivery.

Water Market Transactions:

General Observations

The market price of water is not uniform across the state, and it is not uniform across Southwestern New Mexico. The price varies according to the location, to the scale of use, and to the priority date, among other factors.

In a professional paper <http://wrri.nmsu.edu/publish/watcon/proc52/brown.pdf> addressing market prices as a measure of scarcity (2007), F. Lee Brown found variations that ranged from \$35,000 - \$45,000/AF in the Santa Fe area to \$9,000-\$35,000/AF in the Middle Rio Grande to \$3,000 - \$5,000/AF in the Las Cruces area and to \$2,300 -\$2,400/AF in the Lower Pecos. (He concluded that only in the lower Pecos is water priced at its true scarcity value and that such influences as speculation, OSE rule changes, protests, and sharp increases in building permits in areas such as the Middle Rio Grande may be driving prices more than scarcity. More studies are needed!)

***Note:** The high values of water in the Albuquerque and Santa Fe area have suggested to more than one observer that substantial incentive exists to deliver AWSA water to the Rio Grande in order to offset some water delivery obligations of New Mexico to Texas that are required by compact. In that case, the large upstream municipalities could increase their diversions by an equivalent amount. To create a pipeline to the Rio Grande would, of course, have devastating consequences to the future economic prospects of the people and communities of Southwest New Mexico.*

In a technical paper <http://wrri.nmsu.edu/publish/techrpt/tr356/tr356.pdf> (2010) identifying and forecasting water right prices in the Lower Rio Grande, authors

Leann DeMouche, Shanon Landfair, and Frank A. Ward included the priority year, the volume sold in a transaction, water levels in the Elephant Butte Reservoir, and regional farm income as factors determining the market price of water in the Las Cruces area. The volumes sold and the priority dates were especially influential, with unit prices declining substantially when large volumes were sold in a single transaction and when priority dates were late rather than early. For example, in 2010 the price of water with a 1959 priority date and sold in a 500-AF transaction was estimated to be \$2,480/AF. The unit price of water with an 1890 priority date in a transaction of 99-AF was estimated to be \$3,850.

Summary

The Values of Water Rights in Grant County suitable for municipal use range between \$1,000/AF to \$6,900/AF, depending on quantity.

Analysis

Note: For more than 10 years, the principal author of this proposal was directly involved in the purchase of farms, ranches, and undeveloped property in the Gila and Mimbres basins. The observations presented below draw on this experience. In addition, a prominent long-time realtor, Rebecca Smith of Smith Realty, was consulted on values.

The values suggested in this analysis are generalities. All values should receive the consideration of professional appraisers as projects move forward.

In the Gila Basin, the limitations applied to domestic water use (no outdoor use without a water right) create administrative barriers that undoubtedly affect the price of water rights. Occasionally, 1/8 and even 1/16 AF units of water are sold to rural households in that area for as much as \$5,000 (\$40,000 per acre-foot?). While there have not been many sales of irrigated farms in those basins over the last 10 years, there are some, generally with less than 100 irrigated acres, and the most commonly cited price for an acre of irrigated land has been \$10,000. Typically, the land value has been approximately \$3,000 an acre, making the contributing value of the water right approximately \$7,000/AF.

A current listing is informative. The Davis Farm, for sale at \$1,375,000, is described below. While the price could represent a new high for the contributory value of water (although asking (\approx \$11,000/AF), is different from selling), clearly the seller's assigned value comprises more than the just the land and the water rights.

“The farm is located nearby the riverside communities of Gila and Cliff in what is a relatively primitive and pristine river valley at the last gate on Gila River Road. This site comprised of 100 acres is surrounded by water and flanked by a flourishing river Bosque thriving with wildlife. It is very private and exceptionally beautiful

Included with the 100 deeded acres are 84.20 water rights off the Gila Farm Ditch”.

“The watershed that feeds this great basin is mountainous in all directions providing scenic views. The numerous mountains and ranges of the providence include Bear Mountain, the Mogollon Mountains, and the many ranges and mountains of the vast Gila National Forest.

More prose than poetry is Silver City’s purchase of 102 AF of water rights in that same basin for just \$3,500 AF in 2000. The town transferred the rights from a mining use and a mining location in the Gila National Forest to the Franks wellfield 12 miles away. This wellfield provides town businesses and residents as well as residents in adjacent areas with water.

Finally, as part of the Tyrone Mine close out planning process, an appraisal was performed on 6,000 AF water rights owned by the parent mining company in the Gila Valley. These rights were developed for agricultural use initially in the late 19th and early 20th centuries and were acquired in the 1950s and 1960s for use at the Tyrone Mine. In 2004, the estimated value was \$6,000/AF. (*Phelps Dodge Water Rights Appraisal Review and Related Economic Factors for Valuation of Water Rights - July 13, 2004 Armand L. Smith, Armand Smith & Associates*)

Gila Basin Estimate: \$3,500 to \$10,000/AF and (\$6,000/AF for quantities over 1000 AF). The range in value depends on a number of factors, including location, use, and quantity sold. The sales of fractional units smaller than one acre for rural households are probably unique to the area and are not factors for assessing larger farming and municipal uses.

In the Mimbres Basin, the block administrative system, adopted by the OSE to manage water rights in 1970, restricts the transfer of rights to within a 4-section area—unless specific draw-down criteria are met. This limitation makes a transfer to new use difficult in Grant County. For transfers outside a 4-section block, a pipeline must typically be constructed from the original point of diversion (typically a well) to the new place of use. The kind of recent transfer made by Silver City in the Gila Basin from a mining location in the Gila National Forest to a municipal wellfield is not currently possible. As a result, the delivery costs of water for municipal use are substantially increased in central Grant County.

The case in the Deming area might be quite different, where large farms lie close to the community.

In that part of central Grant County that lies in the Mimbres Basin, most small farms occur in the Mimbres river valley, where the water rights contribute towards a lifestyle value rather than an economic enterprise. A cost of \$5,000/AF is typical for the amounts less than 50 AF. (Personal communication with Rebecca Smith of Smith Realty 12/6/11.)

Until the 1930s, the mining district communities, and to a large extent Silver City as well, relied on domestic wells. Later the local municipal governments began to drill wells with larger capacities, developing new rights through appropriation and also augmenting public supplies through the purchase of large quantities of water rights (500 AF +) from mining companies in the case of Silver City and from large ranches in the case of the mining district south and west of the municipalities, in the Mangas Trench. The exception is Hurley, which never acquired water rights and still leases water from the principal mining company in the area.

While the costs of appropriation or purchases of these municipal rights are significantly in the past and are no longer suitable comparisons for values today, Silver City was recently approached regarding its interest in the purchase of 3,000 AF at \$1,000/AF. A pipeline would be required, however, since the point of diversion lay more than 15 miles from the Town's water system.

In a 2003 technical document by DBS&A, (*Southwest New Mexico Water Planning Region Water Supply and Demand, Volume 1 September 2, 2003*.) it was reported that Deming had acquired 2,500 acres of irrigated agricultural land with a consumptive use equivalence of approximately 4,000 AFY. In 2009, Deming city staff stated that the city was purchasing agricultural water rights for transfer to municipal use at a price of \$2,200/AF (Personal communication from Deming staff to Alyson Siwik 9/14/09).

Mimbres Basin Estimate: \$1,000 to \$6,900/ AF, depending on quantity.

Comments on Estimates

The sales of small quantities of water rights in either basin are probably not relevant to municipal purchase and valuation opportunities. These rights typically involve rural lifestyle values not transferable to municipalities, are difficult to assemble into larger quantities, and are not transferable to public supply wells. The development of adequate delivery infrastructure would be dauntingly expensive at the very least. The most relevant values are likely to be Silver City's purchase of Exxon water rights at \$3,500/AF, the Deming purchases at \$2,200/AF, and the offer of 3,000 AF for \$1,000/AF in the area of the lower San Vicente arroyo (Mangas Trench), which is relatively remote from existing Silver City wells (but near the proposed airport wellfield).

Finally, in Silver City there does exist a formal estimate for the value of a water right that is reflected in the fee structure of the Utility Department. Applicants for new water service to residences pay a water acquisition fee. This fee is levied so that the Town can accumulate over time adequate funds to purchase new water rights in order to offset the water that becomes encumbered to the new accounts. The water acquisition fee is \$1,550 for use in municipal limits and \$2,300 for use

outside municipal limits. Since the Town Engineer estimates that each household uses about 1/3 AF, the combined water acquisition fees for one AF are:

$$\$1,550 \times 3 = \$4,650$$

or

$$\$2,300 \times 3 = \$6,900$$

Silver City's official estimate of the value of a one AF water right ranges from \$4,650 to \$6,900. These values represent values for water sold in small quantities. The values are probably not directly applicable to large quantity purchases that the Town of Silver City uses to augment its water supply.

Cost of Water Development and Delivery as a Metric of Value: General Observations

The critical block administrative structure used by OSE essentially denies the option of transferring additional water rights to existing wellfields of the municipalities in central Grant County. Because water is bulky and expensive to transport and because the development and delivery infrastructure is capital intensive, the value of water is likely to be a function of its development and delivery costs.

In fact, some experts suggest that price commonly reflects development and delivery costs and not the scarcity value of water. (*The Value of Water*. 2005 Michael Hanemann. www.ctec.ufal.br/professor/vap/Valueofwater.pdf)

The best way to use cost as a metric of value is to compare the costs of alternative water projects that deliver equal amounts of water to the same user.

Summary

The proposal submitted by the Grant County Water Commission is the Best Value for water development to serve central Grant County. The alternative proposal to deliver water from a diversion on the Gila River is not as cost-effective when considering the actual needs of the communities.

Analysis

Grant County Water Commission Proposal: The cost of the proposal submitted by the Grant County Water Commission is \$13,776,767 (rounded) for developing the wellfield in the vicinity of the Grant County airport and piping the water to Hurley, and \$16,346,530 (rounded) for providing pipeline infrastructure to link and supplement the water systems of Hurley, Bayard, Santa Clara, Silver City, including the adjacent mutual domestic systems and water associations.

The proposal will make 943 AFY accessible to these communities. More water might also become available in the future.

Should return flow credits from the Bayard regional wastewater treatment plant be secured, an additional 600 AFY or more could possibly be returned to the communities by diverting at the airport wellfield and delivering through the inter-community pipeline. In addition, the area of the proposed wellfield is near large ranches with water rights that have already been leased for mining purposes (and are no longer needed for that purpose), sold to municipalities (but are currently stranded for lack of delivery infrastructure), or are currently idle as a result of rising pumping costs (that are too expensive for agricultural use but not too expensive for municipal use).

Note: The Bayard regional wastewater treatment plant currently discharges approximately 250 AFY, which is pumped to the tailings of the principal local mining company. The mining company will not agree to receive the effluent at the end of two more years, and the municipalities using the wastewater system will need to find an alternative discharge method by then.

Other Proposals: An alternative scenario for delivering water to central Grant County has been suggested that draws on Gila River water diverted in the Cliff-Gila Valley under terms established by the Consumptive Use and Forbearance Agreement (CUFA).

Note: In making cost comparisons between project scenarios, it is important to keep in mind the limited needs projected for the communities of central Grant County. There is no local advantage to delivering and paying for more water than is needed. In fact, there likely to be substantial disadvantages.

There are several cost estimates for the alternative scenario, including:

- an estimate in the 2005 *Southwestern New Mexico Regional Water Plan* by DBS&A
- an estimate range presented in testimony to Congress by the Director of the ISC and the State Engineer in 2003, and

In the estimate denoted in the regional water plan, the authors assume that an inter-community pipeline linking the communities of central Grant County has already been constructed at a cost of \$21,400,000 (the same approximate cost of this application). To deliver water from the Gila River to this system would cost an additional \$143,100,000. The Congressional testimony estimates ranged from \$220,000,000 to \$300,000,000, substantially more than the entire \$128,000,000 that is potentially available to address water supply/demand needs in all of Catron, Grant, Hidalgo, and Luna counties. It is not clear if the ISC estimates include an inter-community pipeline.

- **Grant County Water Commission estimate:**
Inter-Community Pipeline (\$16,973,805) + Wellfield (\$11,152,859) =
\$28,126,664

• **DBS&A Regional Water Plan estimate:**
Inter-Community Pipeline (\$21, 400,000 (their estimate)) + Gila River
Diversion + Additional 35-Mile Pipeline (\$143,000,000) =
\$164,400,000

• **ISC Estimates:**
Inter-Community Pipeline + Gila River Diversion + Additional 35-Mile
Pipeline ((\$220,000,000 - \$16,973,805(?)) =
\$203,026,195?

or (\$300,000,000 - \$16,973,805(?)) =
\$283,026,195?

Note: The diversion costs do not include any of the non-consumptive values lost to river.

Comments on Scenario Estimates:

Both scenarios require an Inter-Community Pipeline. The changing unit in the various estimates is the cost for source water. The proposal submitted by the Grant County Water Commission is the least expensive. The other proposal requires a large initial investment in a single project, with unidentified partners to share costs. Below are several other important features of the proposal submitted by the Grant County Water Commission:

- The proposal's costs fall within the parameters of the AWSA funding available (specifically \$66,000,000 for non-diversion projects) and does not require any additional borrowing, bonding, or financial support from the legislature outside of its regular community programs
- The proposal is scaled to actual need, and does not require the kind of over-scaled investments in public infrastructure that have led some communities to recently declare bankruptcy (Jefferson County in Alabama and Harrisburg in Pennsylvania, for example).
- The proposal can be phased.
- The proposal's operating costs can be phased incrementally to match actual increases in demand.
- The proposal is not subject to the AWSA exchange costs, which in 2010 were \$118/AF.
- The proposal is not vulnerable to the monitoring and mitigation requirements on the Gila River for wildlife protection and conservation.

Value of Water to the Regional Economy:

The four municipalities in central Grant County have independent water systems, which they administer themselves for the benefit of their residents and for benefit of residents in neighborhoods that are adjacent (more or less) but outside municipal limits. Combined, the four municipalities use approximately 4000 AFY of water. These are communities that lie close together relative to the

common dispersal of towns and villages in southern New Mexico. Many people live in Bayard, for example, but work in Hurley, and shop in Silver City. The histories and the economies of the communities are entwined.

Note: Municipal water usage was 4012 AFY in 2000, but population has declined and water use has likely declined as well. That is certainly the case in Silver City. This date is used because it is the most current date contained in the study of water demand in southwestern New Mexico that was performed by Intera, Inc. in 2009 under contract with the ISC.

The municipalities also provide economic benefit beyond their specific boundaries. They serve as a local market for agriculture and a source of labor for mining. They host most schools in the county. They host the justice and law enforcement agencies (including the Sheriff Department), most of the health services such as the regional hospital, and they support fire protection in the county, as well. (All the volunteer fire departments in central Grant County rely on municipal water sources for supply, and they all have mutual aid agreement with the Silver City Fire Department).

The municipalities also host almost all of the technical, financial, and retail services that are relied on by residents and businesses in the county.

Municipal: For FY 2009, their combined total gross receipts were reported by the NM Taxation and Revenue Department to be \$455,816,848 . In the same fiscal year, gross receipts for Grant County (less the municipalities) were \$123,894,944. If county gross receipts outside the municipalities (less gross receipts from agriculture (\$16,461,000)) were added to the municipal receipts, the sum of gross receipts in FY 2009 was \$563,245,792.

Note: FY 2009 was a year of recession. These values are used to avoid overstating the economic output. Obviously there is variation. FY 2011 was a much better year for municipal revenues. The Town of Silver City alone recorded \$440,777,156 in gross receipts.

Summary

The long-term economic benefit to the municipalities of central Grant County investing water infrastructure as proposed is estimated to be \$191,282,935. The contributions to total municipal benefit of the specified categories recreation and fire protection are subsumed in this figure, as the environmental costs—except for the ecological services which are estimated in **Criterion 6.f.**

Analysis

Obviously, water is essential to the viability of the communities and contributes to the general prosperity, economic sustainability, and economic growth of the area, but estimating water's specific contribution to those benefits is complicated. How

much more economic growth would be generated by the availability of additional water? What is the marginal contribution of each additional unit?

There is, it turns out, an estimate for the contribution that investments in sewer and water infrastructure generate. For each dollar invested in water and sewer infrastructure there is a long-term return of \$6.35. This is a measure of marginal productivity and it is reported in: *Local Government Investment in Municipal Water and Sewer Infrastructure: Adding Value to the National Economy. 2008. Richard Krop, Ph.D, Charles Hernick, Christopher Frantz. The Cadmus Group Inc. Prepared for The U.S. Conference of Mayors. Mayors Water Council.* <http://www.usmayors.org/urbanwater/documents/LocalGovt%20InvInMunicipalWaterandSewerInfrastructure.pdf>

Based on that report, the long-term economic benefit of this project is estimated to be \$191,282,936:

$$\$30,123,297 \times \$6.35 = \$191,282,936 \text{ (rounded)}$$

Of course, the real benefit of the water lies in its use. While adequate water infrastructure is a necessity for economic sustainability and growth, it is not in itself sufficient. This proposal is planned to meet actual needs as they occur:

- The immediate need is to provide water to Hurley, which has a municipal water system but no water rights, and to supplement the existing water systems of Bayard and Santa Clara, which pump near their maximum OSE allocations. These measures will sustain the economies of those municipalities and help protect jobs.
- The long-term need is to provide enough water to accommodate demographic and economic growth forecasts for all of the municipalities and the adjacent unincorporated neighborhoods that are dependent on public water supplies.

These needs have different time lines, and the economic output figure derived from the elasticity formula might reasonably be adjusted down somewhat to reflect the staged and incremental nature of projected water use.

Note: The observations above are merely suggestions of value. Of course, the marginal contribution of water to municipal economies should receive the professional consideration of economists as all proposals that move forward.

Other principal economic sectors in Grant County that use water are Mining and Agriculture.

Mining: Mining is the principal industry in Grant County. In 2000, 21,781 AFY was withdrawn, using private infrastructure of the industry. Between 1975 and

2005, the sector's average withdrawal was 29,277. (*Southwest New Mexico Water Planning Region Water Supply and Demand Report: Volume I 2003*. On-line at www.awsaplanning.org). Based on the same report, 39,474 AFY of withdrawal appears to be the industry's maximum permitted use so the industry appears to have a comfortable 10,000 AFY buffer (the difference between the OSE allocated or permitted water rights and 30 years of pumping records) to accommodate future need. Given this buffer, the forecast by the industry of a generally declining trend for mining activity in the area, efforts to shed at least some water leases from other parties, and the absence of a proposal for AWSA water, it appears reasonable to conclude that the availability of more water through the AWSA is not an input likely to generate more copper output.

In fact the mining water rights might very well serve as a source (supply instead of demand?) that can support new industries or other uses in the future as mining activity declines over the long term.

These observations and the marginal contribution of water to copper production should receive the professional consideration of economists as all proposals that move forward.

For FY 2009, Mining and Oil and Gas Extraction was not reported for any of the municipalities as a 2-digit SIC category in the records of the New Mexico Department of Revenue and Taxation. The taxable value of copper is reported not as a gross receipt but as a property value. In FY 2010, the value of copper in Grant County was reported to be \$172,480,724.

Agriculture (Farming and Ranching): In 2000, agriculture as an economic sector in Grant County pumped or diverted 29,805 AF, irrigating 3,659 acres (average over 20 years), and the value of all farm commodities was \$19,958,000 (average over 20 years is \$19,694,700). Livestock constituted 95% (\$18,889,000) of the total. The remainder was hay, vegetables, fruit and nuts, and other crops.

Note; The vast majority of irrigated land in Grant County is used for pasture. The figure for 2000 is a snapshot in time. The average diversion amount over 20 years was not available for this proposal. The average agricultural cash receipts were \$19,694,700. The amount of irrigated land in Grant County declined from 6950 acres in 1985 to 3,695 in 2005. This decline might reflect a reporting error in the way irrigation was reported. After 1998, the irrigated acres did not include land that had water rights was fallow. It is possible that the earlier figure, which stayed unusually steady for 15 year, included fallow land.

These figures all come from the annual Statistical Reports that the Southwest New Mexico Council of Governments issues.

In the 2009 record of gross receipts from the New Mexico Department of Taxation and Revenue, it was reported that Silver City generated \$1,055,686

attributed to Agriculture, Forestry, Fishing, and Hunting, which are all activities gathered under a common 2-digit SIC category. It is not clear how much is solely attributable to agriculture. None of the other municipalities had a similar category in the inventory of revenue sources.

Other modest linkages between Silver City and agriculture are a contract with a rancher adjacent to the wastewater treatment plant, who irrigates 53 acres with effluent, agreements to provide water for cattle tanks where municipal pipelines cross ranchlands, the delivery of water for private and community gardens (as part of its regular residential water service), and the hosting of the area’s largest farmers market during growing season.

How much additional agricultural revenues would be generated by the availability of additional water? Marginal productivity in this sector should receive the professional consideration of economists of all proposals that move forward.

Note: What can be concluded about the following juxtapositions?

- *Municipal use: \$450,000,000 revenues :: 4,000 AFY*
- *Agricultural use: \$20,000,000 revenues :: 29,000 AFY*
- *Mining use: \$172,480,724 valuation :: 29,000 AFY*

New Mexico does not report mining revenues. It reports valuation, which is the basis for taxing that industry.

b. Quantify estimated costs including planning, design, and/or construction, environmental compliance, operation, maintenance, repair, and administrative costs.

Preliminary costs estimates have been provided by Engineers Inc. They are summarized below in Table 3. The full Engineers Opinion of Probable Costs is located in Appendices.

Table 3 - Estimated development, operations and maintenance costs of proposal –

Costs	Phases I-III	Phase IV	Totals
Planning	\$520,811.70	\$276,769.80	\$797,581.50
Design	\$1,195,861.15	\$592,448.01	\$1,788,309.16
Construction	\$17,802,000.00	\$8,738,000.00	\$26,540,000.00
Oversight	\$669,021.41	\$328,384.96	\$997,406.37
Total Development	\$20,187,694.26	\$9,935,602.77	\$30,123,297.03
Operations and Maintenance	\$441,668.12	\$290,628.15	\$732,296.27
Total Development + O&M	\$20,629,362.38	\$10,226,230.92	\$30,855,593.30

Environmental compliance cost estimates have been provided by Engineers Inc. They are summarized below in Table 3, and embedded in the development costs. The full Engineers Opinion of Probable Costs is located in Appendices.

Table 4 - Estimated environmental compliance costs of proposal –

Permitting and management (NMED, USACE, USFWS,	\$48,500.00	\$36,000.00	\$84,500.00
Archaeological and biological surveys	\$36,000.00	\$30,000.00	\$66,000.00
Topographic survey	\$14,000.00	\$10,000.00	\$24,000.00
Easement acquisition and NMDOT utility permits	\$60,000.00	\$30,000.00	\$90,000.00
Mitigation and restoration (reseeding and mulching)	\$160,000.00	\$140,000.00	\$300,000.00
Total Environmental	\$318,500.00	\$246,000.00	\$564,500.00

- c. **Identify the source of local contributions and demonstrate the commitment and ability to pay any local cost-share for the project proposal, including any exchange costs. [1 point for every % of the project to be borne by the local sponsor]**

The operating and maintenance costs will be paid by the four municipalities in proportion to their actual use as they take advantage of the water made available through the new wellfield and the inter-community pipeline.

Municipal Water Rates in Central Grant County

<i>Town</i>	Residential Rate: 6,000 Gallons/Month	Commercial Rate: 6,000 Gallons/Month
Bayard	\$27.89	\$35.64
Hurley	\$24.79	\$24.79
Santa Clara	\$34	\$45
Silver City (in Municipal Limits)	\$19.97	\$19.97
Silver City (outside Municipal Limits)	\$39.94	\$39.94

To determine the revenue generated by a water right that yields one AF of water each year, the AF volume is converted into gallons (325,853), divided by 6,000 to determine the number of 6,000-gallon units that comprise an acre-foot, and multiplied by \$19.97 in the case of Silver City, which charges the lowest rates.

$$\text{Annual Revenue per AF} = (325,853/6000) \times \$19.97 = \underline{\$1,084.57 \text{ (rounded)}}$$

Annual Revenue from 943 AF = $943 \times \$1,084$ (rounded) = \$1,022,212

Each municipality already has storage tanks, delivery systems, and staff to manage the facilities. The established water rates structures can easily accommodate the incremental costs of meeting new demand (above what is currently used) as it occurs.

Note: The water rate for use outside Silver City but still dependent on the municipal water system is \$39.94 (double the in-town rate). This price might set a local upper limit of willingness-to-pay as a metric of the value of water.

In addition to soliciting AWSA support from the ISC, the Grant County Water Commission and its members will individually and collectively seek funding support from:

- New Mexico Water Trust Board,
- Colonias program of the New Mexico Finance Authority,
- Rural Utility Services program of the Economic Development Administration,
- Environmental Infrastructure program of the U.S. Army Corps Finance Authority,
- WaterSmart program of the U.S. Bureau of Reclamation, and
- Other programs as they are identified.

Note: A clearinghouse of information for additional or supplemental funding sources would be a very useful product to develop and share among the applicant for AWSA funding.

The Grant County Water Commission seeks from AWSA funding sources 50% of the cost of the project:

AWSA funding sought by the Grant County Water Commission is \$15,046,116

$$\underline{\$30,093,232} \times 50\% = \underline{\$15,046,116}$$

6. [120] Describe how the proposal addresses the needs of a particular group or groups or interests on the issue of:

a. Historic uses, traditions, cultures, and customs. [up to 10 points]

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. Current and future demands for water in the Southwest Planning Region.
[up to 20 points]**

This proposal specifically addresses the needs of central Grant County. Identified below are the **public water supply needs** for each municipality and the **scale of total need for additional water**

Note: 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”. It is available in the ISC offices. Other important data sources include the 2010 U.S. Census (available on-line), and the comprehensive plans of Bayard, Santa Clara, and Silver City.

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.
- 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 near 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.

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 0.75% annually.” A 0.75% 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 water rights of the municipalities (6,015 AFY).

Note: *A Report on Historical and Future Population Dynamics in NM. 2008. A. Alcantara .“ It is available at the ISC Offices.*

- Should such a 35% population increase occur, an appropriate planning precaution might be to acquire additional water rights in an amount (about 1,416 AFY) adequate to serve the new increment of the forecast and to keep the surplus in reserve as a buffer.

Note: This amount could also be made up through a combination of new water rights and the reduction of use through conservation measures. This proposal proposes 750 AFY of new water and reductions use in Silver City through leak detection, etc. that might save an additional 560 AFY. That saved amount can be used later to accommodate future growth. The combined sum of new water rights (750 AFY) and saved water (560 AFY) provide a total benefit of 1,310 AFY, a figure quite close to the 1,416 AFY mentioned above. The difference could come out of the reserve that Silver City currently has with plenty of additional water to spare.

- Over the last 30 years, on the other hand, the total combined population of Bayard, Hurley, Santa Clara, and Silver City has 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 avoid over-investing 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. **Flood Control. [up to 20 points]** This project does not have a flood control component. Given the limitations of the CUFA diversion quantities, any flood control claims from any project submitted for AWSA funding should be carefully reviewed.

- d. **Fire protection, prevention, or suppression. [up to 20 points]** Municipal water supplies support a fire station in each of the 4 municipalities of central Grant County, as well as 3 additional ones in the county Pinos Altos, Whiskey Creek, and Tyrone. The Silver City fire department also has a fire substation, and the Tyrone volunteer fire department has 3 substations. All four of the municipalities have fire hydrants integrated into their water delivery systems. Tyrone, Pinos Altos, and parts of the Arenas Valley Water Association have fire hydrants, as well.

These assets provide public safety, both in terms of preventing fires, through education and inspection, and of fire suppression. They protect \$225,047,816 worth of property in the municipal boundaries and more beyond the boundaries (*2010 SWNMGOG Statistical Abstract*), and they contribute towards lower insurance assessments on local businesses and residences. These assets also enhance community appeal for people and businesses considering relocation to this area.

The value of economic benefit has been subsumed into the general figure of municipal benefit. A statistical analysis portioning contributions might be useful if the project moves forward.

As population increases these amenities should grow at a matching rate to sustain at least the current level of services. Additional water and delivery infrastructure made available at a rate equal to the rate of demographic growth will support this recommendation.

- e. **Recreation. [up to 20 points]** The municipalities provide the principal opportunities for organized recreation for both youth and adults in Grant County. The following amenities contribute towards the quality of life for youth as well as adults, and they are important factors for attracting and sustaining economic growth:
 - 17 baseball fields (14 of which are irrigated.)
 - 2 soccer fields (irrigated)
 - 6 football fields (irrigated)

- 1 18-hole golf course (irrigated)
- 13 neighborhood parks (irrigated)
- 2 municipal swimming pools and a university pool

Recreational facilities such as these build community, diminish anti-social behavior, and attract visitors from outside the area to participate in competition.

The value of economic benefit has been subsumed into the general figure of municipal benefit. A statistical analysis portioning contributions might be useful if the project moves forward.

As population increases these amenities should grow at a matching rate to sustain at least the current level of services. Additional water and delivery infrastructure made available at a rate equal to the rate of demographic growth will support this recommendation.

- f. **Environmental protection and/or enhancement. [up to 20 points]** Planning literature is replete with analyses pointing to the benefits urban areas provide by encouraging density and minimizing ecological footprints. (For those who are unfamiliar with this proposition, I recommend reading The Agile City (2011)) Density is dependent in turn on efficient infrastructure, not least of which is a reliable water delivery system.

In addition to providing clean water to drink, which enhances public health, municipal water systems support a key protective measure for surface and ground water through the return of waste products to a treatment plant. Inadequate septic systems in rural areas of moderate population can be significant sources of water pollution.

The value of economic benefit has been subsumed into the general figure of municipal benefit. A statistical analysis portioning contributions might be useful if the project moves forward.

As population increases these amenities should grow at a matching rate to sustain at least the current level of services. Additional water and delivery infrastructure made available at a rate equal to the rate of demographic growth will support this recommendation.

In addition, this proposal leaves intact all of the ecological services currently provided by the Gila River and its tributaries. The value of those services as well as existence and bequest values have been estimated to be approximately \$260,000,000. (Rice 2005) Currently, only a single analysis has been performed to estimate those values. As projects move forward, more reviews should be considered.

- g. **Any others. [up to 10 points]** Other (Emergent Properties): Municipal water supplies support all of the schools in Grant County with the exception the Cliff K-12 School in the Gila Valley and the San Lorenzo elementary school in the Mimbres Valley. In Silver City, municipal water also supports Western New Mexico University, the Gila Regional Hospital, numerous clinics and medical services that enhance their services through proximity to the hospital. In fact, density, proximity, and connectivity are key urban attributes that encourage cooperation and collaboration between businesses, creating a whole that is greater than the parts. These attributes sustain and enhance economic growth in the community. And in a very fundamental way, they are contingent on reliable, secure and efficient water systems.

7. [40] List those supporting the application, including federal, state, and local government entities, Indian nations, tribes or pueblos, irrigation or conservation districts, non-profit organizations and other entities. Provide letters of support for the application. [up to 40 points]

Ten entities of the type mentioned above have signed a letter of support for this project:

- Mayor of Hurley
- Mayor Bayard
- Mayor of Silver City
- Chairman of the Grant County Commission
- President of the Green Chamber of Commerce
- Vice-Chair of the Southwest New Mexico Council of Governments
- President of the Gila Economic Development Alliance
- Director of the Upper Gila Watershed Alliance
- Director of the Gila Resources Information Project
- Director of the Gila Conservation Coalition

The letters are in the appendix.

8. [30] Describe whether the proposal would benefit one or more than one of the counties in the Southwest New Mexico Planning Region—Catron, Grant, Hidalgo, and/or Luna Counties. [up to 40 points]

This project benefits all of the municipalities of central Grant County and the adjacent unincorporated neighborhoods. The population of the benefited area is approximately 26,000 or about 87% the entire population of Grant County.

The applicant has long maintained that a single project cannot provide a fair distribution of benefits across the large area of Southwestern New Mexico with its diverse needs and widely dispersed peoples. The delivery of multiple projects tailored to the specific needs of localities is a far more efficient system of sharing the AWSA benefits. Mere size should not trump efficiency and fairness. Larger scale projects have a higher risk of failure because they are less adaptable to changing circumstances or conditions (climate change?) that had not been anticipated.

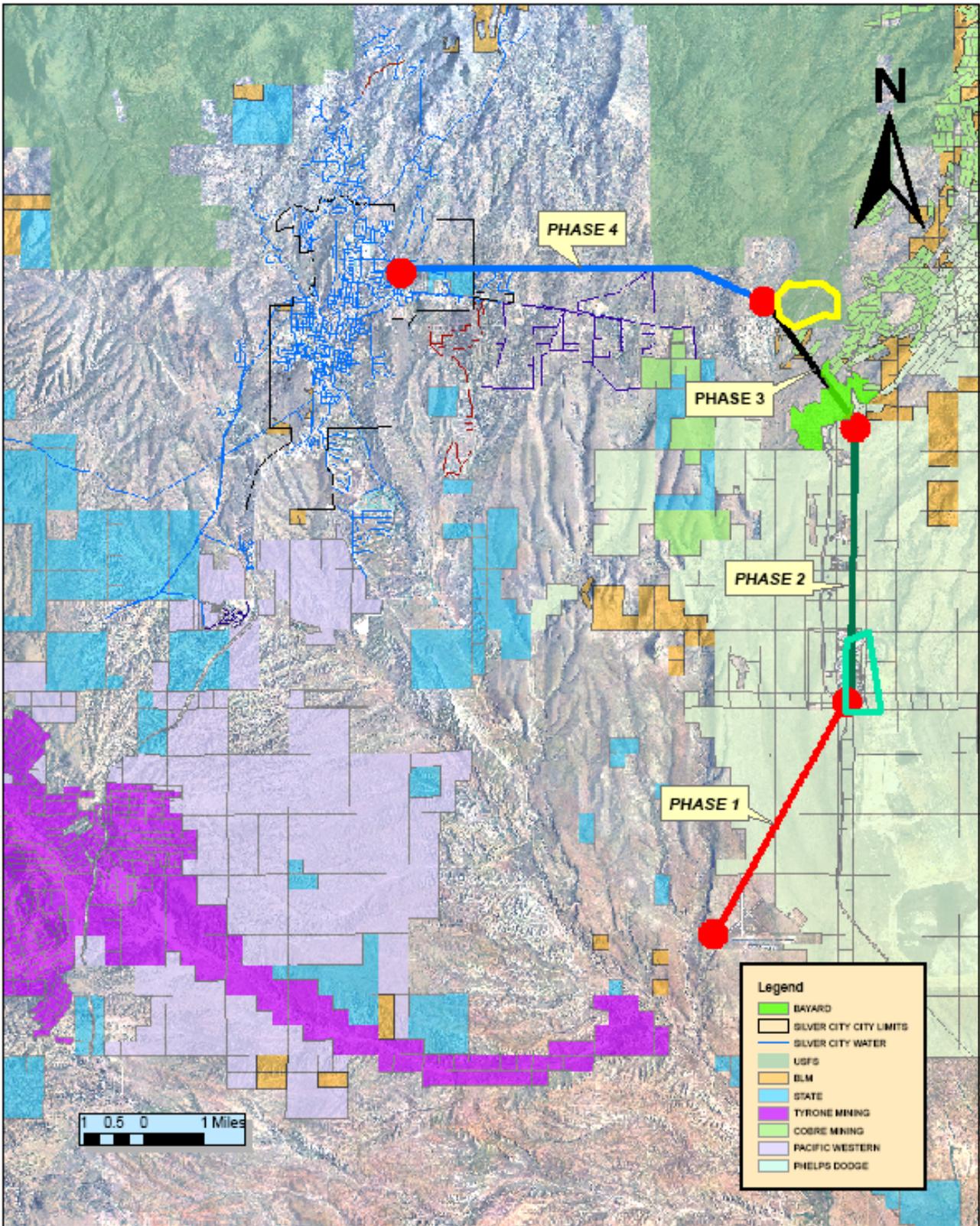
9. [50] Describe whether the proposal would support economic growth or benefit one or more than one of the following interests in the Southwest New Mexico Planning Region—agricultural, ranching, municipal, recreational, or other (specify). [10 points/interest up to 50 points]

This project supports economic growth for the communities of central Grant County, especially that of the smaller communities in the mining district. The nature of that support has been extensively outlined in 5.a. The specific phasing of the project with the proposed delivery of benefits first to Hurley, then to Bayard and Santa Clara, and finally to Silver City is a product of that emphasis.

This project has other broad municipal benefits as outlined in 5.a, which include recreational benefits fully listed in 6.e, fire protection benefits explained in 6.d., environmental benefits explained in 6.f, and additional synergistic benefits outlined in 6.g. This project makes very modest contributions to farming and ranching, which in Grant County are largely a single endeavor, as observed in the section estimating Economic Benefit to the region.

Appendices

PROJECT ELEMENTS





ENGINEERS OPINION OF PROBABLE CONSTRUCTION COST
 ASWA Silver city Airport Water Rights to Santa Clara; 943 Ao-Ft/Yr
 12/13/2011
 E# HUR0501X
 Phases 1-3

The unit prices used in this Opinion of Probable costs are based on 2011 construction experience. If construction is not completed in 2011, these costs should be escalated annually until construction is complete.

The following is our opinion of most probable project costs based on our best judgment and experience. Since we have no control over the cost of labor, materials, equipment, competitive bidding, or market conditions, we cannot guarantee that the actual project or construction costs will not vary from the opinion of probable cost prepared.

The total project cost will also be affected by the time of year that bids are solicited, the amount of time allocated for construction, and the total amount of construction performed under a particular contract.

ITEM NUMBER	ITEM DESCRIPTION	UNIT PRICE	UNIT	A) DEVELOPMENT OF SILVER CITY AIRPORT RIGHTS w/ RECHARGE CREDITS		B) EXTENSION TO BAYARD		C) EXTENSION TO SANTA CLARA		A+B+C TOTAL AMOUNT
				ESTIMATED QUANTITY	OPTION COST	ESTIMATED QUANTITY	OPTION COST	ESTIMATED QUANTITY	OPTION COST	
1	Grant Silver City Airport Rights with Groundwater Recharge Credits	\$ -	AC-FT	943.0	\$ -	0.0	\$ -	0.0	\$ -	\$ -
2	Purchase property for equipment placement	\$ 15,000	ACRE	14	\$ 210,000	4	\$ 60,000	4	\$ 60,000	\$ 330,000.00
3	Utility and Access Easements	\$ 25,000	LS	1	\$ 25,000	1	\$ 25,000	1	\$ 25,000	\$ 75,000.00
4	1,000 ft Exploratory Well	\$ 150	LF	1000	\$ 150,000					\$ 150,000.00
5	1,300 ft Production Wells - 4 Each	\$ 650	LF	5200	\$ 3,380,000					\$ 3,380,000.00
6	Well Pump and appurtenances	\$ 175,000	EA	4	\$ 700,000	0	\$ -	0	\$ -	\$ 700,000.00
7	825,000 Gallon Welded Steel Water Tank w/ concrete foundation, and security fencing	\$ 650,000	EA	1	\$ 650,000	1	\$ 550,000	0	\$ -	\$ 1,100,000.00
8	250,000 Gallon Welded Steel Water Tank w/ concrete foundation, and security fencing	\$ 300,000	EA	0	\$ -	0	\$ -	1	\$ 300,000	\$ 300,000.00
9	Pipe Risers to Top Fill Hurley Main Tanks	\$ 25,000	LS	2	\$ 50,000	0	\$ -	0	\$ -	\$ 50,000.00
10	Overhead Power to well locations.	\$ 140,000	LS	3	\$ 420,000	0	\$ -	0	\$ -	\$ 420,000.00
11	Overhead Power to booster pump location.	\$ 140,000	LS	1	\$ 140,000	0.3	\$ 42,000	0.3	\$ 42,000	\$ 224,000.00
12	Electrical Riser and Services at Well Pumps	\$ 30,000	LS	4	\$ 120,000	0	\$ -	0	\$ -	\$ 120,000.00
13	Electrical Riser and Services at Booster Station	\$ 30,000	LS	1	\$ 30,000	1	\$ 30,000	1	\$ 30,000	\$ 90,000.00
14	Sodium Hypochlorite Generator and injector	\$ 150,000	EA	1	\$ 150,000	0.5	\$ 75,000	0.5	\$ 75,000	\$ 300,000.00
15	Booster pump station - Pumps, Piping, Structure, Fencing, Drain field	\$ 300,000	EA	1	\$ 300,000	0.5	\$ 150,000	0.5	\$ 150,000	\$ 600,000.00
	SCADA Control System	\$ 700,000		0.6	\$ 420,000	0.2	\$ 140,000	0.2	\$ 140,000	\$ 700,000.00
16	16" Ductile Iron Pipe, 36" Bury	\$ 105	LF	15000	\$ 1,575,000					\$ 1,575,000.00
17	16" (DIPS) HDPE (PE3408) Pipe, DR9, 36" Bury, Fuse Joints	\$ 102	LF	15000	\$ 1,530,000	0	\$ -	0	\$ -	\$ 1,530,000.00
18	16" (DIPS) HDPE (PE3408) Pipe, DR11, 36" Bury, Fuse Joints	\$ 85	LF	0	\$ -	21600	\$ 1,836,000	0	\$ -	\$ 1,836,000.00
19	12" (DIPS) HDPE (PE3408) Pipe, DR11, 36" Bury, Fuse Joints	\$ 50	LF	0	\$ -	0	\$ -	8900	\$ 445,000	\$ 445,000.00
20	Flow Control Valve Vault and Assembly	\$ 35,000	EA	0	\$ -	1	\$ 35,000	1	\$ 35,000	\$ 70,000.00
21	16" Shut-off Gate Valve w/box	\$ 3,000	EA	8	\$ 24,000	4	\$ 12,000	0	\$ -	\$ 36,000.00
22	12" Shut-off Gate Valve w/box	\$ 2,500	EA	0	\$ -	0	\$ -	4	\$ 10,000	\$ 10,000.00
23	Water Supply Meter, 10" mainline, 1600 GPM	\$ 12,000	EA	1	\$ 12,000	1	\$ 12,000	0	\$ -	\$ 24,000.00
24	Water Supply Meter, 6" mainline, 800 GPM	\$ 10,000	EA	0	\$ -	0	\$ -	1	\$ 10,000	\$ 10,000.00
25	Air Release Valve Assembly	\$ 4,000	EA	10	\$ 40,000	2	\$ 8,000	2	\$ 8,000	\$ 56,000.00
27	Blow Off Valve Assembly	\$ 4,000	EA	4	\$ 16,000	1	\$ 4,000	1	\$ 4,000	\$ 24,000.00
28	16" Check Valve	\$ 5,500	EA	5	\$ 27,500	2	\$ 11,000	0	\$ -	\$ 38,500.00
29	12" Check Valve	\$ 4,000	EA	0	\$ -	0	\$ -	2	\$ 8,000	\$ 8,000.00
30	Traffic Control	\$ 5,000	LS	1	\$ 5,000	1	\$ 5,000	1	\$ 5,000	\$ 15,000.00
31	Construction Staking by Contractor	\$ 10,000	LS	1	\$ 10,000	0.4	\$ 4,000	0.4	\$ 4,000	\$ 18,000.00
32	Compaction testing	\$ 170	ALLOW	150	\$ 25,500	220	\$ 37,400	150	\$ 25,500	\$ 88,400.00
33	Pipeline Bore under Hwy 160, 20 In Diameter	\$ 500	LF	150	\$ 75,000	0	\$ -	150	\$ 75,000	\$ 150,000.00
34	Boring Under Railroad Track, 20 In Diameter	\$ 500	LF	100	\$ 50,000	0	\$ -	0	\$ -	\$ 50,000.00
35	Pipeline Bore under Diaz Ave., 20 In Diameter	\$ 500	LF	80	\$ 40,000	0	\$ -	0	\$ -	\$ 40,000.00
36	Pipeline Bore under Onno Contractor Road, 20 In Diameter	\$ 500	LF	0	\$ -	150	\$ 75,000	0	\$ -	\$ 75,000.00
37	Concrete Encasement Arroyo Crossing	\$ 100	LF	150	\$ 15,000	375	\$ 37,500	375	\$ 37,500	\$ 90,000.00
38	Miscellaneous Concrete	\$ 400	CY	15	\$ 6,000	0	\$ -	0	\$ -	\$ 6,000.00
39	Reseeding of Work Areas	\$ 2,000	AC	20	\$ 80,000	20	\$ 40,000	20	\$ 40,000	\$ 160,000.00
40	SWPPP Plan Preparation	\$ 5,000	LS	1	\$ 5,000	0	\$ -	0	\$ -	\$ 5,000.00
41	SWPPP Plan Management	\$ 15,000	LS	1	\$ 15,000	0.45	\$ 6,750	0.45	\$ 6,750	\$ 28,500.00
	SUBTOTAL ALTERNATIVE #7				\$ 10,197,000.00		\$ 3,195,650.00		\$ 1,535,750.00	\$ 14,928,400.00
	 NMGR @	7.2500%			\$ 739,282.50		\$ 231,684.63		\$ 111,341.88	\$ 1,082,309.00
	 CONTINGENCY @	12%			\$ 1,223,640.00		\$ 383,478.00		\$ 184,250.00	\$ 1,791,408.00
	CONSTRUCTION TOTAL				\$ 12,160,000.00		\$ 3,811,000.00		\$ 1,831,000.00	\$ 17,802,000.00
	Basic Engineering @	6.20%			\$ 753,920.00		\$ 236,282.00		\$ 113,522.00	\$ 1,103,724.00
	Construction Observation @	3.50%			\$ 425,600.00		\$ 133,385.00		\$ 64,085.00	\$ 623,070.00
	 O&M Manual				\$ 10,000.00		\$ -		\$ -	\$ 10,000.00
	NMGR on Professional Services @	7.375%			\$ 87,727.10		\$ 27,262.94		\$ 13,058.52	\$ 128,088.56
	 Surveys - Additional Services				\$ 10,000.00		\$ 2,000.00		\$ 2,000.00	\$ 14,000.00
	Archaeological & Biological Surveys - Additional Services				\$ 20,000.00		\$ 8,000.00		\$ 8,000.00	\$ 36,000.00
	ROW Acquisition - Additional Services				\$ 30,000.00		\$ 15,000.00		\$ 15,000.00	\$ 60,000.00
	Permits - Additional Services				\$ 8,000.00		\$ 3,000.00		\$ 3,000.00	\$ 14,000.00
	LOC Binder Preparation				\$ 2,000.00		\$ -		\$ -	\$ 2,000.00
	RD Grant Application Assistance - Additional services				\$ 3,000.00		\$ -		\$ -	\$ 3,000.00
	Legal Services (max) @	2%			\$ 243,200.00		\$ 76,220.00		\$ 36,620.00	\$ 356,040.00
	NMGR on Additional Services @	7.375%			\$ 23,319.75		\$ 7,686.23		\$ 4,765.73	\$ 35,771.70
	ALTERNATIVE #7 TOTAL				\$ 13,776,766.85		\$ 4,319,836.17		\$ 2,091,091.24	\$ 20,187,694.26



**ANNUAL OPERATIONS AND MAINTENANCE
COST ESTIMATE**

ASWA Silver City Airport rights to Santa Clara; 943 ac-ft/yr
12/13/2011

1. ELECTRICAL POWER CONSUMPTION - UPDATED FOR HIGER FLOWS

Basic Service Fee	\$ 8.00 /month
Energy Charge	
Rate for 1st 1,000 kWh	\$ 0.1500 /kWh
Rate for additional usage	\$ 0.1200 /kWh
Demand Charge added for load over 5 kW	
October-April	\$ 150.00 kWh/kW
May-September	\$ 200.00 kWh/kW
estimated average system flow rate (600 ac-ft/yr)	585 gpm
Estimate average system head	1272.3 ft
daily operating time	12 hr/day
Total pump and motor efficiency	52%
average power draw	361.6 HP
	0.7457 kW/HP
monthly power use	88409 kWh-hrs
Assumed Peak Demand	404.4 kW
Calculate Annual Power Cost	
Basic Service Fee	\$ 96.00 /year
Energy Charge:	\$ 142,068.27 /year
Demand Charge: Oct-Apr	\$ 50,326.74 /year
Demand Charge: May-Sept	\$ 47,930.23 /year
	\$ 98,256.97 /year
Total Annual Power Cost	\$ 240,421.25

2. MAINTENANCE PARTS & SUPPLIES

Assume 50% of cost of electric power
Total Annual Maintenance Parts & Supply \$ 120,210.62

3. OPERATING MANPOWER

Number of crew personnel	1
Daily work load	8 hrs/day
Days worked per week	7 days
Labor rate	\$ 15.00 per hour
Benefit Load on labor rate	50% per hour
Total Annual Operating Manpower	\$ 65,520.00

4. OPERATION OF DISINFECTION SYSTEM

Softener Salt for Hypochlorite Generation	\$4,500.00
Power Costs for hypochlorite generation	\$1,800.00
Total Annual Disinfection Cost	\$6,300.00

5. SERVICE VEHICLE

Daily Miles traveled	50 miles/day
Mileage Rate	\$ 0.51 /mile
Total Annual Vehicle Cost	\$ 9,216.25

TOTAL ANNUAL COST SUMMARY

Total Annual Power Cost	\$ 240,421.25
Total Annual Maintenance Parts & Supply	\$ 120,210.62
Total Annual Operating Manpower	\$ 65,520.00
Total Annual Disinfection Cost	\$ 6,300.00
Total Annual Vehicle Cost	\$ 9,216.25
Total Annual Cost	\$ 441,668.12



ENGINEERS OPINION OF PROBABLE CONSTRUCTION COST

ASWS Silver city to Santa Clara; 943 Ac-Ft/Yr

12/12/2011

The unit prices used in this Opinion of Probable costs are based on 2011 construction experience. If construction is not completed in 2012, these costs should be escalated annually until construction is complete.

The following is our opinion of most probable project costs based on our best judgment and experience. Since we have no control over the cost of labor, materials, equipment, competitive bidding, or market conditions, we cannot guarantee that the actual project or construction costs will not vary from the opinion of probable cost prepared.

The total project cost will also be affected by the time of year that bids are solicited, the amount of time allocated for construction, and the total amount of construction performed under a particular contract.

				<u>SILVER CITY TO SANTA CLARA @ 943 AC-FT/YR</u>	
ITEM NUMBER	ITEM DESCRIPTION	UNIT PRICE	UNIT	ESTIMATED QUANTITY	OPTION COST
1	3 Million Gallon Welded Steel Water Tank w/ concrete foundation, and security fencing	\$ 2,000,000	EA	1	\$ 2,000,000
2	Booster pump station - Pumps, Piping, Structure, Fencing, Drain field	\$ 300,000	EA	1	\$ 300,000
3	Overhead Power to Booster Pump Location.	\$ 100,000	LS	1	\$ 100,000
4	Electrical Riser and Services at Booster Pumps	\$ 30,000	LS	1	\$ 30,000
5	14" Ductile Iron Pipe, 36" Bury	\$ 90	LF	9300	\$ 837,000
6	14" (DIPS) HDPE (PE3408) Pipe, DR9, 36" Bury, Fuse Joints	\$ 80	LF	30700	\$ 2,456,000
7	14" DI Fittings	\$ 1,200	EA	20	\$ 24,000
8	Pressure Reducing Valve, Vault & Assembly	\$ 35,000	EA	0	\$ -
9	Flow Control Valve, vault & Assembly	\$ 35,000	EA	1	\$ 35,000
10	Air Release Valve Assembly	\$ 4,000	EA	7	\$ 28,000
11	Blow Off Valve Assembly	\$ 4,000	EA	6	\$ 24,000
12	14" Shut-off Gate Valve w/box	\$ 3,200	EA	32	\$ 102,400
13	14" Check Valve	\$ 5,500	EA	12	\$ 66,000
14	Water Supply Meter, 10" mainline, 1800 GPM	\$ 15,000	EA	1	\$ 15,000
15	Sodium Hypochlorite Generator and Injector	\$ 150,000	EA	1	\$ 150,000
16	SCADA Control System	\$ 700,000	LS	1	\$ 700,000
17	Miscellaneous Concrete	\$ 500	CY	15	\$ 7,500
18	Concrete Encasement for Arroyo Crossings	\$ 100	LF	500	\$ 50,000
19	Asphalt Repair	\$ 26	SY	500	\$ 13,000
20	Replace Concrete Curb & Gutter	\$ 20	LF	600	\$ 12,000
21	Traffic Control	\$ 15,000	LS	1	\$ 15,000
22	Construction staking by Contractor	\$ 10,000	LS	1	\$ 10,000
23	Compaction Testing	\$ 170	ALLOW	150	\$ 25,500
24	Reseeding of Work Areas	\$ 2,000	AC	70	\$ 140,000
25	SWPPP Plan Preparation	\$ 6,000	LS	1	\$ 6,000
26	SWPPP Plan Management	\$ 22,000	LS	1	\$ 22,000
27	Security Fencing for Tank Site	\$ 15,000	LS	1	\$ 15,000
28	Pipeline Bore Under Highway, 20 in Diameter	\$ 500	LF	300	\$ 150,000
29	Property Acquisition for Tank Site	\$ 15,000	AC	4	\$ 60,000
SUBTOTAL SILVER CITY to SANTA CLARA					\$ 7,393,400.00
NMGRT @ 6.1875%					\$ 457,466.63
CONTINGENCY @ 12%					\$ 887,208.00
CONSTRUCTION TOTAL					\$ 8,738,000.00
Basic Engineering @ 6.20%					\$ 541,756.00
Construction Observation @ 3.50%					\$ 305,830.00
O&M Manual					\$ 10,000.00
NMGRT on Professional Services @ 7.375%					\$ 63,246.97
Surveys - Additional Services					\$ 10,000.00
Archaeological & Biological Surveys - Additional Services					\$ 30,000.00
ROW Acquisition - Additional Services					\$ 30,000.00
Permits - Additional Services					\$ 8,000.00
LOC Binder Preparation					\$ 2,000.00
RD Grant Application Assistance - Additional services					\$ 3,000.00
Legal Services (max) @ 2%					\$ 174,760.00
NMGRT on Additional Services @ 7.375%					\$ 19,009.80
SILVER CITY to SANTA CLARA TOTAL					\$ 9,935,602.77



**ANNUAL OPERATIONS AND MAINTENANCE
COST ESTIMATE**

ASWA Silver City to Santa Clara; 943 ac-ft/yr
12/13/2011

1. ELECTRICAL POWER CONSUMPTION - UPDATED FOR HIGER FLOWS

Basic Service Fee	\$ 8.00 /month
Energy Charge	
Rate for 1st 1,000 kWh	\$ 0.1500 /kWh
Rate for additional usage	\$ 0.1200 /kWh
Demand Charge added for load over 5 kW	
October-April	\$ 150.00 kWh/kW
May-September	\$ 200.00 kWh/kW
estimated average system flow rate (600 ac-ft/yr)	585 gpm
Estimate average system head	700 ft
daily operating time	12 hr/day
Total pump and motor efficiency	52%
average power draw	198.9 HP
	0.7457 kW/HP
monthly power use	54143 kW-hrs
Assumed Peak Demand	222.5 kW
Calculate Annual Power Cost	
Basic Service Fee	\$ 96.00 /year
Energy Charge:	\$ 78,325.72 /year
Demand Charge: Oct-Apr	\$ 27,405.62 /year
Demand Charge: May-Sept	\$ 26,100.69 /year
	\$ 53,506.21 /year

Total Annual Power Cost \$ 131,927.93

2. MAINTENANCE PARTS & SUPPLIES

Assume 50% of cost of electric power
Total Annual Maintenance Parts & Supply \$ 65,963.97

3. OPERATING MANPOWER

Number of crew personnel	1
Daily work load	8 hrs/day
Days worked per week	7 days
Labor rate	\$ 15.00 per hour
Benefit Load on labor rate	50% per hour
Total Annual Operating Manpower	\$ 65,520.00

4. OPERATION OF DISINFECTION SYSTEM

Total Annual Disinfection Cost \$ 18,000.00

5. SERVICE VEHICLE

Daily Miles traveled	50 miles/day
Mileage Rate	\$ 0.51 /mile
Total Annual Vehicle Cost	\$ 9,216.25

TOTAL ANNUAL COST SUMMARY

Total Annual Power Cost	\$ 131,927.93
Total Annual Maintenance Parts & Supply	\$ 65,963.97
Total Annual Operating Manpower	\$ 65,520.00
Total Annual Disinfection Cost	\$ 18,000.00
Total Annual Vehicle Cost	\$ 9,216.25
	<u>\$ 290,628.15</u>

**Grant County Water Commission
P. O. Box 1188
Silver City, NM 88062**

Members:

Alex C. Brown, Town of Silver City, Chair
Edward Encinas, Mayor, Town of Hurley
Richard Bauch, Mayor, Village of Santa Clara
Charles Kelly, Mayor, City of Bayard
Brett Kasten, Commissioner, County of Grant

December 6, 2011

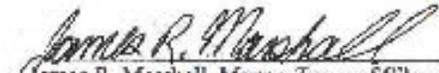
Esteban Lopez, Director
New Mexico Interstate Stream Commission
P. O. Box 25102
Santa Fe, NM 87504-5102

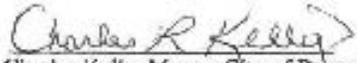
Dear Mr. Lopez:

We are sending this letter as an expression of support for the AWSA proposal submitted to the New Mexico Interstate Stream Commission by the Grant County Water Commission.

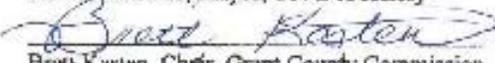
Sincerely,

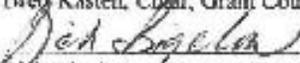
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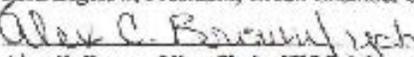

James R. Marshall, Mayor, Town of Silver City


Charles Kelly, Mayor, City of Bayard


Edward Encinas, Mayor, Town of Hurley


Brett Kasten, Chair, Grant County Commission


Rich Bigelow, President, Green Chamber of Commerce


Alex C. Brown, Vice-Chair, SWNM Council of Governments


Jeremiah Garcia, President, Gila Economic Development Alliance

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P. O. Box 1188
Silver City, NM 88062**

Members:

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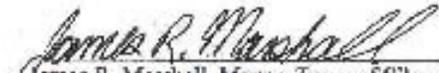
December 6, 2011

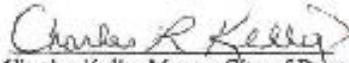
Esteban Lopez, Director
New Mexico Interstate Stream Commission
P. O. Box 25102
Santa Fe, NM 87504-5102

Dear Mr. Lopez:

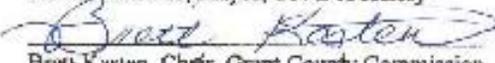
We are sending this letter as an expression of support for the AWSA proposal submitted to the New Mexico Interstate Stream Commission by the Grant County Water Commission.

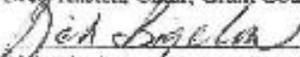
Sincerely,

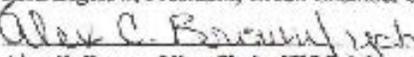

James R. Marshall, Mayor, Town of Silver City

 ← 2
Charles Kelly, Mayor, City of Bayard


Edward Encinas, Mayor, Town of Hurley


Brett Kasten, Chair, Grant County Commission


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P. O. Box 1188
Silver City, NM 88062**

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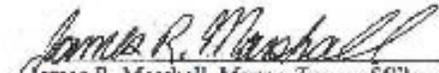
December 6, 2011

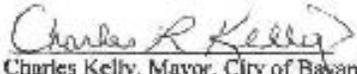
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P. O. Box 25102
Santa Fe, NM 87504-5102

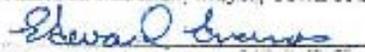
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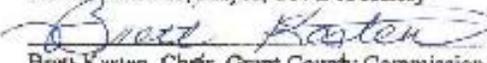
Sincerely,

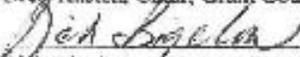

James R. Marshall, Mayor, Town of Silver City

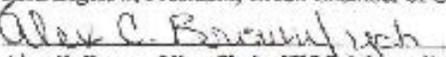

Charles Kelly, Mayor, City of Bayard

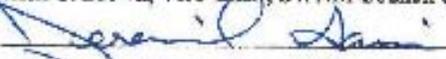

Edward Encinas, Mayor, Town of Hurley

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Brett Kasten, Chair, Grant County Commission


Rich Bigelow, President, Green Chamber of Commerce


Alex C. Brown, Vice-Chair, SWNM Council of Governments


Jeremiah Garcia, President, Gila Economic Development Alliance

**Grant County Water Commission
P. O. Box 1188
Silver City, NM 88062**

Members:

Alex C. Brown, Town of Silver City, Chair
Edward Encinas, Mayor, Town of Hurley
Richard Bauch, Mayor, Village of Santa Clara
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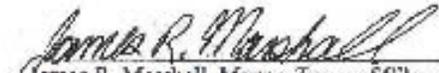
December 6, 2011

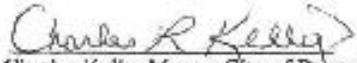
Esteban Lopez, Director
New Mexico Interstate Stream Commission
P. O. Box 25102
Santa Fe, NM 87504-5102

Dear Mr. Lopez:

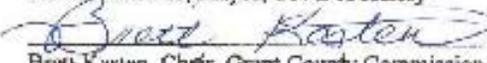
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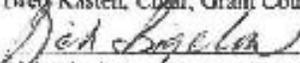
Sincerely,

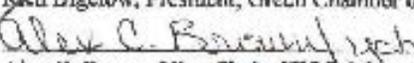

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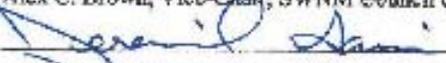

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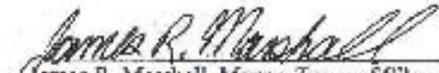
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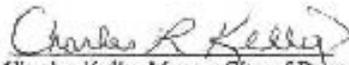
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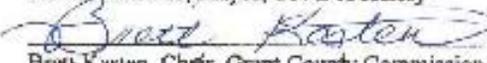
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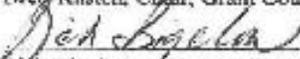
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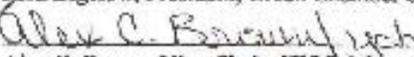

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← 5


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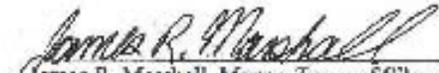
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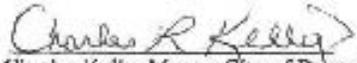
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Santa Fe, NM 87504-5102

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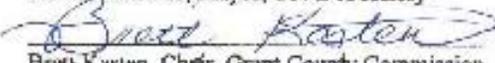
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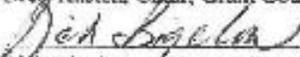
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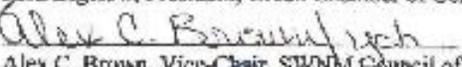

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← 6


Jeremiah Garcia, President, Gila Economic Development Alliance

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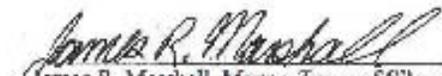
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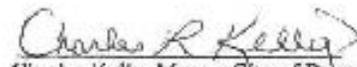
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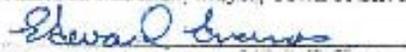
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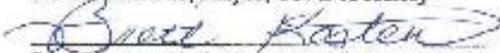
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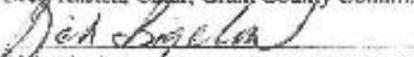
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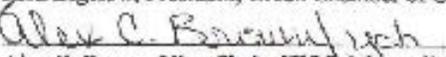

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Jeremiah Garcia, President, Gila Economic Development Alliance

