EXHIBIT A

SCOPE OF WORK

Task 1: Public Participation

The Southwest New Mexico Regional Water Planning Steering Committee (Steering Committee) will manage the public participation program, including notification and facilitation of Steering Committee meetings. DBS&A will provide the following resources to the Regional Water Planning Manager to assist with the public participation program:

- Example public involvement plans and relevant sections of the Southwest Region Public Involvement Plan for use by the region in forming its public involvement plan
- A representative of DBS&A will attend four Steering Committee meetings during the year. The meetings dates will be agreed upon with the Regional Water Planning Manager and Southwest New Mexico Regional Water Planning Steering Committee
- A representative from Engineers, Inc. will attend the bi-monthly meetings that are not attended by DBS&A, and if needed will attend the meetings where DBS&A is present. Engineers, Inc. will attend a total of four meetings.

Task 1 Deliverables: Attendance at Steering Committee meetings, presentation materials for steering committee meetings, public involvement materials supplied to regional water planning manager.

Task 1 Budget: 9,900

Task 2: Water Supply Analysis

The water resource assessment will focus on addressing water planning question 1: What is the water supply available to the region? As required by the ISC, this task will consist of a synthesis of currently published data and information to develop a comprehensive picture of the water resource availability in the planning region. The goal of this effort is to build upon the previous water planning efforts to complete the water supply requirements as defined in the Regional Water Planning Handbook and the supplemental OSE guidelines.

To complete the water supply assessment efficiently, we will rely on existing, easily accessible data sources and, to the extent available, information from previous water planning studies in the Southwest New Mexico Counties. When data is insufficient, we will clearly identify data gaps. Ranges of available will be estimated to account for data uncertainties. In areas where the confidence in the data is five or less on a scale of one to ten, DBS&A will so note and make recommendations as to what is needed to increase the confidence level to eight or better. This information will be supplied in a memorandum to the Steering Committee and will not be incorporated into the Regional Water Plan.

Task 2.1. Document weather and climate data. One of the goals of the regional water planning process is to ensure that projected demands are met under all water supply scenarios. To develop an understanding of water supply patterns, we will compile hydrologic information. This

assessment will involve a summary of historical weather data and its impact on water supplies within the region. This will also include a summary of the region's climatic data—including both rainfall and snowfall distribution and seasonal variability—from, for example, the Signal Peak SNOTEL site located in the Upper Gila watershed of Grant County, as well as NCDC stations and USGS gage stations within the planning region.

A key component of this task will be to review the drought history in the area. Indicators such as the Palmer Drought Severity Index and the Pacific Decadal Oscillation (PDO) index will be evaluated and will be supplemented with a summary of published articles or accounts that describe the severity and impacts from droughts. In cases where indicators from the PDO index are used, qualifying language regarding the reliability of these indicators will be footnoted.

Task 2.2. Update surface water inventory and water quality analysis. Addressing water planning questions 1 to 4 requires identifying the amount of surface water available to the region and determining if that supply is adequate to meet future needs. However, the amount of surface water varies considerably depending on precipitation, elevation, and location within the region, and there are considerable seasonal variations at any given location. The assessment will be organized by separately evaluating existing streamflow data from the major drainage basins (Gila, San Francisco, and Mimbres Rivers) in the planning region. The overall goal of the surface-water supply assessment is to provide a basis for developing an understanding of surface-water supplies in normal years, as well as during droughts of varying severity. Specific components of the water supply inventory include:

- A map showing the location of drainage basin boundaries, major streams and their tributaries, stream gaging stations, and reservoirs. The map will be prepared by WRRI. DBS&A will coordinate the map preparation and review the map for accuracy.
- The physical attributes such as topography and location of irrigated lands will be described.
- Stream gaging stations will be identified, as well as any diversions above the station. Observations will be analyzed for trends.
- For ungaged streams, the results of any modeling or other means of estimating monthly and annual flows will be described, if available.
- All major reservoirs will be identified and thoroughly described.
- The water supply inventory will include a water quality assessment. Incorporation of a water quality assessment will facilitate correlation between the available water supplies and the end uses suitable for the quality of those supplies. The assessment will include a preliminary review of known sources of contamination and identification of those supplies that are most vulnerable to contamination. Both point and nonpoint sources of contamination will be identified. Information from existing and ongoing studies, such as the effects from historical tailing pond spills and the Gila River and San Francisco River watersheds TMDLs will be incorporated into the water resource assessment. The quality of groundwater within each major aquifer in the region will also be documented.

The information will be analyzed to determine the adequacy of surface-water supplies during drought periods. Using historical records, the assessment will look at surface-water yields during years of average precipitation, as well as during wet and dry years. Hydrographs will be analyzed, and seasonal flow characteristics will be identified, as will flood frequencies and

magnitudes. DBS&A will be assisted in the surface water analysis by Dr. Tim Ward, P.E., who has previously modeled surface water flows in the Gila River Basin.

Task 2.3. Prepare groundwater inventory. The amount of groundwater available for the ten declared groundwater basins (Gallup, Rio Grande, Gila-San Francisco, Mimbres, Virden Valley, Nutt-Hockett, Lordsburg, San Simon, Animas, Playas Valley) and the undeclared basins located within the planning region will be estimated to further address water planning question 1: What is the available water supply?

The groundwater assessment will include:

- We will determine the hydrogeologic framework for the region by identifying geologic structures and units and their water-bearing characteristics, and developing geologic cross sections for each major basin in the region. Existing cross sections will be used for this part of the assessment.
- To help predict the available supply, we will use groundwater data such as well locations and depths, groundwater levels, groundwater withdrawals, aquifer thicknesses, and hydraulic parameters (storativity, transmissivity, specific capacity, etc.) and groundwater recharge estimates. Ranges of available supply will be estimated to account for data uncertainties.
- DBS&A will prepare an inventory of aquifer pump tests of record for each groundwater basin, as well as a summary of results.
- We will identify all wells on the USGS Observation Well Program and prepare tables that provide a chronological history of water table elevations for key wells and will analyze the data for trends, including changes in water levels due to wet and dry years and/or withdrawals and returns.
- We will identify municipalities, state and federal entities, and industries (e.g., Phelps Dodge) that monitor groundwater elevations and yields from their wells, and prepare tables that provide a chronological history of water table elevations and yields from key wells, including analysis of observed trends.
- DBS&A will describe the sources and rates of recharge in the region, as well as any effects on recharge from snowmelt and precipitation, stream flows, or return flows from irrigation or wastewater treatment.
- For the declared groundwater basins in the area, we will research and describe the OSE criteria for the administration of the basins.
- We will discuss water quality for each groundwater basin, including an analysis of changes in water quality over the period of record. The analysis will include all point source and nonpoint source pollution and discussions regarding leaking septic tanks and the effects of current and historical mining activity, since these are significant groundwater quality concerns within the planning region.
- Describe possible hydrologic connection with surface flows
- Describe ability to use groundwater supplies in relationship with the legal constraints of adjudications, the Globe Equity Decree and Arizona v. California Decree. The analysis of

the ability to use groundwater supplies will be based on the legal analysis described in Section 2.4, below.

Task 2.4. Analyze legal constraints to the water supply. New Mexico legislators created the regional water planning program and specified that regional water plans must be reviewed for potential conflict with laws relating to impact on existing water rights [NMSA 1978, §72-14-44(c)]. The OSE guidance provided in the Regional Water Planning Handbook also states that regional water plans must be reviewed with respect to all applicable state and federal laws.

The work product for this task will be an overview of state and federal laws in relation to how they may affect the water supply in the region. The relevance the 1935 Globe Equity Decree and the 1968 Colorado Basin River Project Act to the regional water supply will be part of the legal overview.

Task 2 Deliverables: Annotated Table of Contents for Water Supply Assessment, Draft Water Supply Report incorporating tasks 2.1 through 2.4

Task 2 Budget: $75,900

Task 3: Water Demand Analysis

Previous regional water planning efforts (Southwest New Mexico Regional Water Plan, 1990) have included future water demand projections for 2030. The projections will be updated in close coordination with the ISC, and the Southwest Regional Water Planning Steering Committee. One of the goals of the update is to develop a final product that reflects a prediction of future growth and demand that is (1) based on sound demographic projection methodologies and (2) supported by a consensus of the ISC, and the Southwest New Mexico Regional Water Planning Steering Committee stakeholders.

Task 3.1. Define water use categories. We will summarize water use according to categories of measurement used by the OSE, including public water supply and self-supplied domestic wells, agriculture, livestock, commercial, reservoir evaporation, mining, power, and industrial uses.

Task 3.2. Prepare an inventory of surface and groundwater withdrawals. To facilitate continued water management and to develop a baseline for projecting future water use, information regarding current and historical water uses will be compiled. Water use information from earlier planning efforts will be supplemented with more recent information from municipalities, irrigation districts, and the OSE. Municipal water providers, mutual domestic water utilities, and irrigation districts will be asked to provide updated demand numbers, and domestic, agricultural, and livestock water use will be estimated. This information will be presented in graphical displays so that historical water use trends can easily be observed by the Steering Committee and the public.

DBS&A will include a description of the irrigated acreage by basin and include a description of the crops grown, irrigation requirements, conveyance losses, and conservation measures. The inventory will also include a discussion regarding livestock numbers.

Task 3.3. Prepare revised population and demographics study. To address water planning question 2, population and water use projections must be developed using the most current information. The first step in this task is to project demographics and economic growth

throughout the planning period. SPM will develop 40-year forecasts for the region. The forecasts will include projections of population (which impacts domestic demand) and employment (which impacts commercial and industrial demand). Projections of population and employment will be developed in 10-year increments for the 40-year timeframe. Forecasts will be done for each of the four counties within the planning area, as well as several of the largest communities within the region.

Data and information sources that will be used in developing the forecasts include historical growth trends, land use plans, existing forecasts for Catron, Grant, Hidalgo, and Luna Counties and its communities (e.g., forecasts by the University of New Mexico Bureau of Business and Economic Research [BBER]), trends in visitation in southwestern New Mexico, and plans of major landowners, developers, and businesses that could impact development. The State Economic Development Department also maintains databases with population-related information. Some of the information will be obtained through personal interviews within the region.

All sources of data will be compared. Preference will be given to the data that most accurately reflects the local characteristics of population and demographics. In accordance with the *Regional Water Planning Handbook,* the use of any data other than those from BBER will be justified.

Forecasts will be developed under two or three scenarios, taking into account varying assumptions about the health of the U.S. economy, visitation trends, the degree of development to be experienced in the region, and the implementation of water conservation measures.

Once population and economic growth forecasts are complete, water use projections will be developed. The water use projections will rely on historical use data, regional averages (i.e., the OSE publication *Water Use by Counties,* Wilson 1995), and/or projected water conservation measures to estimate future water use. This will result in a projection of future water use for each of the water use categories described in Task 3.2.

Once the data are obtained and analyzed, they will be presented to the Steering Committee. This information will be displayed in graphic format showing trends and likely future scenarios.

Task 3.4. Prepare inventory of water rights. In order to better understand the water supply and possible constraints, we will assemble an inventory of major water rights in Catron, Grant, Hidalgo, and Luna Counties. Information such as amount of water right, general location, and priority date, where available, will be compiled from the water rights holders and from the OSE WATERS database. This overview will include surface and groundwater rights and will be limited to 25 to 30 major water rights holders such as municipalities, public and private water utilities, conservancy and irrigation districts, acequias, and owners of significant amounts of irrigated land. The results of the preliminary water rights inventory will be compared to the results of the historical and current water uses. Additionally, the inventory will provide useful information for evaluating potential alternatives such as water banking and drought management.

However, in basins where adjudications have taken place an inventory of water rights will not be necessary. The section on legal constraints on the water supply for those basins will consist of a description of the adjudication decree, and OSE administrative criteria (where applicable) and the limiting factors contained therein.

Task 3.5. Estimate sustainable yields. The amount of water that can be sustainably withdrawn in an area is dependent upon recharge to groundwater supplies, the amount of renewable surface water coming into the region each year, and the projected withdrawal rates. We will rely on all the information gathered from the surface and groundwater assessments and the demand assessment to estimate sustainable yields. The uncertainty in the sustainable yield estimates, which may be significant, will be noted.

Task 3.6. Finalize water supply and demand assessment. We will present summaries of the water supply and demand assessments to the Steering Committee and can also open those meetings to the public, if desired. We will also discuss our preliminary findings with large water users within the region. Based on the comments that we receive, we will make necessary revisions to the assessments. The final water supply and demand assessments will be included as part of the Southwest New Mexico Counties Regional Water Plan during Phase II.

Task 3 Deliverables: Annotated Table of Contents for Water Demand Assessment, Draft Water Demand Assessment, including tasks 3.1 through 3.6

Task 3 Budget: $43,100

Task 4: Water Budget

We will compile information on major water budget terms (precipitation, surface water inflow, recharge, evapotranspiration, etc.) for both average and dry years. We will draw on information from the surface water and demand assessments to present a simple water budget that graphically illustrates the balance between supply and demand in both average and dry years.

Deliverable: Average and drought year water budget
Budget: $4600

Task 5: Progress Reporting

Four quarterly progress reports will be prepared as part of the contract. The progress reports will provide a summary of progress for the quarter. Additionally, DBS&A will attend four progress meetings with the ISC. To minimize travel expenditures, the meetings will be held in conjunction with other Steering Committee meetings held in the region, will be attended by conference call, or will be held in Santa Fe.

Task 5: Deliverables: four progress reports, attendance at progress meetings, either in person or via conference call
Budget: $1,500